

Teacher Companion Book

classklap
BY Eupheus



Mathematics

Name of teacher: _____

Section(s) taught: _____

Class **5**
Part **1**

Annual Academic
Calendar

Curriculum to
Learning Objectives

Vision-to-Action
Plans

Exit
Assessments



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Textbook Features



Let Us Learn About

Contains the list of learning objectives to be covered in the chapter



Think

Introduces the concept and arouses curiosity among students



Recall

Discusses the prerequisite knowledge for the concept from the previous academic year/chapter/ concept/term



Remembering and Understanding

Explains the elements in detail that form the basis of the concept Ensures that students are engaged in learning throughout



Application

Connects the concept to real-life situations by enabling students to apply what has been learnt through the practice questions



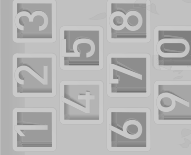
Higher Order Thinking Skills (H.O.T.S.)

Encourages students to extend the concept learnt to advanced scenarios



Drill Time

Additional practice questions at the end of every chapter



Workbook Features

Recall



Aims at revising the prerequisite knowledge for the concept from the previous year/chapter/concept/term

Remembering and Understanding



Provides opportunities for practising the basic elements involved in the learning of the concept

Application



Applies the understanding of the concept to questions related to real-life scenarios

Higher Order Thinking Skills (H.O.T.S.)



Extends the concept to more advanced and challenging questions that meet the criteria of higher order thinking skills

Practice Questions



Aims at revising the chapter with supplemental practice questions

Pedagogical Explainer

Indicates the class

Knowledge that learners are expected to have in order to understand the concept better. This is acquired from the previous lessons or classes.

Indicates the chapter name

Indicates the sub-concept name

Indicates how the concept taught is related to concepts covered in the previous, current and next class(es)

A – Curriculum to Learning Objectives: Geometry

Prior Knowledge		• Basic lines and figures				
Class	C. No.	Chapter Name	SC. No.	Sub-concept Name	KC No.	Key Concept
1	1	Shapes	1.1	Understand Spatial Words	1.1.a	• basic flat and solid figures
					1.1.b	• corners and sides of objects/figures
					1.1.c	• outlines of the bases of the objects
2	1	Shapes	1.1	Identify the Geometrical Features of Objects	1.1.a	• lines, open figures and closed figures
					1.1.b	• drawing figures using lines
					1.1.c	• basic flat and solid figures
					1.1.d	• flat figures as outlines of the surfaces of solid figures
3	1	Shapes	1.1	Vertices and Diagonals of Two-dimensional Shapes	1.1.a	• identifying 2D shapes with straight and curved lines
					1.1.b	• identifying sides, corners and diagonals
					1.1.c	• making a tangram
					1.1.d	• recognising 3D shapes and their faces and edges
4	1	Shapes	1.1	Circle and its Parts	1.1.a	• circle and its parts
			1.2	Reflection and Symmetry	1.1.b	• drawing a circle
					1.2.a	• reflection and symmetry in figures
					1.2.b	• tessellation and tiling
5	1	Shapes	1.1	Identify and Classify Angles	1.1.a	• angles and naming the angles
					1.1.b	• using a protractor
					1.1.c	• properties of a protractor
					1.1.d	• types of angles
			1.2	Nets and Views of Solids	1.2.a	• nets of cubes, cuboids, cylinders and cones
					1.2.b	• top, front and side views of objects

LIST OF ABBREVIATIONS USED

- C. No. - Chapter number
- SC. No. - Sub-concept number
- KC No. - Key concept number
- Comp. No. - Indicates the Competency numbers as per NCF 2022
- TB - Textbook
- WB - Workbook
- THK - Think
- RCL - Recall
- REM/UND - Remembering and Understanding
- APP - Application
- HOTS/H.O.T.S. - Higher Order Thinking Skills
- CW/HW – Classwork/Homework
- PTM - Parent Teacher Meeting
- PRS - Personal Revision Sheet
- FA – Formative Assessment
- PA – Periodic Assessment
- MYA – Mid-Year Assessment
- AA – Annual Assessment

Teaching day for the lesson and the actual date on which the plan is taught

Indicates the textbook/workbook page numbers and the section(s) covered on that day

The class level outcomes or enabling objectives for the day

Teaching strategies for the day

The list of teaching resources to be procured/arranged before the class

The suggested CW/HW for the day

Space for teacher's notes

B Vision-to-Action Plan: 1.1 Vertices and Diagonals of Two-dimensional Shapes

Day and Planned Date	TB Page No. and Section	KC No.	Daily Learning Outcome(s)	Teaching Strategies	Resources	Practice		Teacher's Notes
						CW	HW	
1 DD/MM/YYYY	1-3 – THK, RCL	1.1.a	<ul style="list-style-type: none"> Recall types of lines and figures. Draw and identify 2D shapes using lines. 	<ul style="list-style-type: none"> Using Concrete Material Direct Instruction 	<ul style="list-style-type: none"> Sheets of paper for each learner 	TB: Pg. 2 (Try this) TB: Pg. 3 (Table)	WB: Pg. 1 (Q. 1-3)	
2 DD/MM/YYYY	3,4 – REM/UND, TMB	1.1.b	<ul style="list-style-type: none"> Identify and name shapes, sides, vertices and diagonals. 	<ul style="list-style-type: none"> Direct Instruction Activity Method 	<ul style="list-style-type: none"> Chart of 'Diagonals and Vertices' drinking straws 	TB: Pg. 4 (Try this, TMB) WB: Pg. 2 (Q. 7-12)	WB: Pgs. 1, 2 (Q. 4, 5, 6) WB: Pgs. 2, 3 (Q. 13-16)	

Written Work																							
Section	Q.1	Q.2	Q.3	Q.4	Q.5	Q.6	Q.7	Q.8	Q.9	Q.10	Q.11	Q.12	Q.13	Q.14	Q.15	Q.16	Q.17	Q.18	Q.19	Q.20	Q.21	Q.22	Comp. Qs. Total Qs.
A																							
B																							
C																							

Checklist for textbook/workbook implementation

Space for the teacher to write how to handhold/challenge learners

Names		Teacher's Notes	
Handhold Learners			
Challenge Learners			

Indicates the current day out of the total days allotted for the chapter

Indicates the textbook/workbook page number(s)

All the important words covered in the last class or on that day

Suggested ways to teach the concept effectively using the teaching strategies provided in the Teaching Strategies section of this book

Indicates the pages of the book where the teacher can spend more time than suggested when needed

Indicates the pages of the book that the teacher can speed up when needed

Quick questions to check learners' understanding

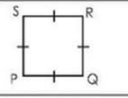
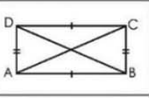
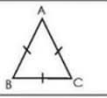
Annual Day: 3/64	Day: 3/6	Actual Date: _____	Page: 3, 4	Important Words <ul style="list-style-type: none"> Last class: sides, vertex, diagonal Today: equal sides 	Duration: 1 min
----------------------------	--------------------	------------------------------	----------------------	---	------------------------

The given triangle has 3 sides named as AB, BC and CA. We can also name them as BA, CB and AC.

The different number of markings on the sides of the triangle show that the lengths of all the 3 sides are different.




If all the sides have the same number of markings, we can say that the lengths of all the 3 sides are the same.

Let us now find the number of sides of a few 2D shapes and name them.

Shape			
Name of the shape	Square	Rectangle	Triangle
Number of sides	4 (All sides are equal.)	4 (Opposite sides are equal.)	3 (All sides are equal in this case.)
Names of sides	PQ, QR, RS, SP	AB, BC, CD, DA	AB, BC, CA

We find objects of various shapes around us.

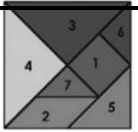
Complete in the following table by writing the basic shapes, number of the vertices and diagonals of the given objects.

Object			
Basic shape			
Number of vertices			
Number of diagonals			

Tangram

A tangram is a Chinese geometrical puzzle. It consists of a square that is cut into pieces as shown in the given figure.

To create different shapes, we arrange these tangram pieces with their sides or vertices touching one another.



Teaching Transaction Peer Learning (20 min): <ul style="list-style-type: none"> Use TB: Pg. 3, 4 to show how to label equal sides of 2D shapes by using small lines. Have learners read and discuss the first table given in the TB: Pg. 4. Have each learner make a table of their own, using different shapes in the first column, without labels. Learners trade tables with their partners. Each learner will fill out the remaining columns of their partner's table. They will label vertices and equal sides, and write shape names, number of sides and names of sides. Guided Learning (7 min): <ul style="list-style-type: none"> Show some everyday objects and ask learners to give the basic shape of each one. Ask learners to complete the second table given in TB: Pg. 4. 	Duration: 27 min
--	-------------------------

Class Pulse Check 1) What is the shape of the wall of classroom? 2) How many diagonals are there for a carrom board?	Duration: 2 min
---	------------------------

Questions to test the key concept(s) on suggested days or for revising the concepts taught

Space for the teacher to write approximately how many learners answered correctly










Space to track TB and WB completion; also to reflect on the learners' understanding of a concept

Space for the teacher to write the names of learners who need handholding or learners who need to be challenged

Helps the teacher identify if the concept is to be retaught, revised or practised for exams

C – Exit Assessment

	Suggested questions to test the key concept(s)	Key Concept(s)	Number of learners who answered correctly
1	How many curved lines does a rectangle have? (Ans. zero)	Day 1 - identifying 2D shapes with straight and curved lines	
2	How many diagonals does a circle have? (Ans. zero)	Days 2, 3 - identifying sides, corners and diagonals	
3	How many diagonals does a square have? How many vertices? (Ans. 2, 4)	Day 4 - making a tangram	
4	What is the shape of a face of a cuboid? (Ans. rectangle)	Day 5 - recognising 3D shapes and their faces and edges	
5	Which 3-D figure can you make using six square-shaped cards of the same size? (Ans. cube)	Day 5 - recognising 3D shapes and their faces and edges	

Post-lesson Reflection					
TB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	WB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Enthusiastic participation		<input type="checkbox"/>		<input type="checkbox"/>	
Concept clarity in the classroom		<input type="checkbox"/>		<input type="checkbox"/>	
Concept clarity through the workbook		<input type="checkbox"/>		<input type="checkbox"/>	

	Handhold Learners	Challenge Learners
Names		
Exam Revision Strategy	Reteach <input type="checkbox"/> Revise <input type="checkbox"/>	Practise <input type="checkbox"/>
App Report	Number _____	Signature _____

Teaching Strategies

Practising

What?

- ✓ Enables learning and skill-building through repetitive practice to ensure that the learners practise independently

Why?

To help in building independent mastery of the skill taught, reinforce the development of skills through repetition and improve problem-solving and critical thinking abilities

Teacher

How to use?

- ✓ State the learning outcomes/skills that the learners will practise.
- ✓ Instruct the step-by-step method to solve/learn a skill.
- ✓ Let each learner independently practise by solving a similar sum or applying a skill.
- ✓ Make sure that all learners are able to solve the problems independently.
- ✓ Provide help individually to learners during the practice.

Learners

- ✓ Understand the sum to solve/skill to develop while the teacher is instructing.
- ✓ Follow the same instructions to solve the problems independently.
- ✓ Ask questions to clarify doubts.

Sample

- Discuss number names of 4-digit numbers as shown in the textbook.
- Ask the learners to work through the examples independently, checking the solution in the textbook.
- Closely look into how each learner is solving and correct their mistakes if any.
- Conclude by saying, 'We have learnt to write the number names of 4-digit numbers.'

Activity Method

What?

- ✓ Helps learners explore and learn by designing role plays, dramas, games, songs and so on

Why?

To provide learners a classroom environment which encourages them to participate actively, collaborate and learn; facilitates multisensory learning of concepts

Teacher

- ✓ Plan for the type of activity based on the learning outcome.
- ✓ Arrange the resources, if required.
- ✓ Arrange the classroom so that it is convenient to conduct the activity.
- ✓ State the purpose of the activity by writing it on the blackboard.
- ✓ Ensure all learners participate and have hands-on experience while conducting the activity.
- ✓ Summarise the activity by clearly stating what the learners did, what they observed and the learning from it.

How to use?

Learners

- ✓ Organise for the activity as per the instructions.
- ✓ Understand the rules and the purpose of the activity.
- ✓ Participate in the activity and note down the observations/results.
- ✓ Relate the activity to the concept to be learnt.

Sample

Learning outcome: To mark the angles in the different letters of the alphabet; name the angles and their types

- Before class, arrange for chart paper and markers. Ask the learners to bring their protractors.
- Use an example from the textbook (different angles marked on letters of the alphabet).
- Ask learners to make charts showing different letters of the alphabet.
- Then, instruct learners to:
 - show the angles made by the vertices in each letter,
 - measure the angles,
 - name the types of angles.

Using Concrete Material

What?

- ✓ Makes learning engaging by using objects and teaching materials to get a hands-on understanding of a concept

Why?

To help learners better understand an abstract concept by seeing, touching and feeling

Teacher

How to use?

Learners

- ✓ Decide the type of concrete material for a particular concept. For example, counting blocks, place value board, geoboard, etc.
- ✓ Based on the concrete material, group the learners. (Consider: How many items are available? How much space is needed?)
- ✓ Distribute the concrete material to groups, pairs or individual learners.
- ✓ Tell students how to use the material. E.g., measure, move, count, etc.
- ✓ Help them make the connection to the mathematical concept involved.
- ✓ Conclude/Summarise by connecting the concrete material to the expected learning outcomes.

- ✓ Use the concrete material as per the teacher's instructions.
- ✓ Make the connection between concrete material and abstract concepts.
- ✓ Ask relevant questions to develop a better understanding.

Sample

Learning outcome: To measure and learn—sum of the 3 interior angles of a triangle equals 180 degrees.

- Prepare cutouts of different types of triangles in paper/chart for every learner and protractor.
- Distribute cutouts of triangles, one for every learner. Include different types (acute, obtuse and right triangles).
- Group learners into pairs.
- Ask each learner to measure all the angles of one triangle using a protractor and then find the sum of all three angles.
- Let each learner in the pair share the measures of the angle and their sum.
- To conclude, use an example from the textbook to discuss and explain how the sum of all the interior angles of a triangle is 180 degrees.

Direct Instruction

What?

- ✓ Uses straightforward and explicit instructions, usually to teach a specific skill or introduce a new concept

Why?

To help learners understand the correct approach/procedure to solve sums or build a skill

Teacher

How to use?

Learners

- ✓ Introduce the topic with a motivating question or idea (For example, read the 'I Think' section of TB).
- ✓ Relate it to prior knowledge.
- ✓ Instruct clearly about the concept/skill that you want the learners to know/understand, i.e., what you are doing and why you are doing it.
- ✓ Ensure the instructions are explained step-by-step.
- ✓ Ask questions in between to check for understanding.
- ✓ Set the pace of the instruction to ensure all learners understand.
- ✓ After the direct instruction, ask learners to independently demonstrate the skills or solve the sums using the steps you have shown.

- ✓ Be alert and listen to the teacher's explicit instructions.
- ✓ Write down the steps.
- ✓ When in doubt, ask questions.
- ✓ Solve/Answer questions.

Sample

- Use a geoboard to make figures as shown in the textbook. Show how angles are formed by two rays.
- Draw the same figures on the blackboard and show how to name an angle.
- Draw several intersecting line segments as given in the textbook on the blackboard and show the different angles made by the lines at the intersection.
- Show how to name and identify the different angles.
- Explain step by step how to draw and label the angles and how to identify the type of an angle.
- Have learners draw three intersecting lines and label all the angles.

Guided Learning

What?

- ✓ Facilitates and guides the learners to try new skills with teacher support; crucial for lower age groups

Why?

To build the basic skills of solving sums and understanding concepts; helps in transitioning from direct instruction to independent learning

Teacher

How to use?

Learners

- ✓ Plan the learning for the entire class or in groups.
- ✓ Play the lead role in the class.
- ✓ Introduce the skill/concept or the sum to be solved.
- ✓ Ensure the learners follow the instructions and repeat the teacher actions as directed.
- ✓ Be aware of learners who need more support and focus on them.
- ✓ To conclude, call a few learners to the blackboard and make them repeat the skill/concept learnt.

- ✓ Listen to the instructions and follow the teacher.
- ✓ Repeat the action as instructed by the teacher.
- ✓ Answer questions.

Sample

- Use your arm to show the different types of angles given in the textbook—acute, right, obtuse and straight angles.
- Let each learner repeat the angle that you have shown using their arms.
- Now make each angle using your arm, and name the type of angle. Let each learner repeat it after you.
- Bring a few learners to the front. Guide them to make the angles using their arms and name them.
- Conclude by drawing different types of angles, marking the rays and also naming them.
- Let each learner note them down in their books.

Interactive Discussion

What?

- ✓ Engages learners in a discussion to share their inputs

Why?

To involve learners in a conversation to discuss the concept/related example/scenario with the class

Teacher

How to use?

Learners

- ✓ Ask questions to check previous knowledge.
- ✓ Introduce a new concept by asking questions/sharing an example/describing a scenario.
- ✓ Initiate a discussion among learners either in groups, pairs or individually.
- ✓ Capture learners' responses on the blackboard using appropriate graphic organisers, where applicable.
- ✓ Conclude the discussion by arriving at the expected learning outcome.

- ✓ Respond to the questions.
- ✓ Have doubts clarified.

Sample

- Display a calendar page for the month of March in class.
- Explore why the different patterns emerge in the calendar through an interactive discussion:
 - Ask how many Fridays occur in a month with 31 days.
 - Show how Saturday appears every 7 days. It is a growing pattern with the rule of 'adding 7'.
 - Ask the learners explain how that pattern is made.
- Show a few patterns made by the dates as shown in the textbook.
- Have learners discuss the rules followed by the different patterns.
- Conclude the discussion by categorising the patterns that were observed.

Peer Learning

What?

- ✓ Encourages learners to interact with each other and learn from each other

Why?

To engage and involve all types of learners and build cooperative learning, in order to collaborate, work in a team and build confidence among learners

Teacher

How to use?

Learners

- ✓ Frame the specific learning outcome for a concept/problem to be solved/tasks to be completed for peer learning.
- ✓ Group learners as a team or a pair with complementary strengths.
- ✓ Tell the groups about the expected outcome, what to do, and the time frame in which it has to be completed.
- ✓ Supervise and moderate the discussions/work in the groups.
- ✓ Ensure that learners have learnt from their peers by asking questions, helping them write, or solving the problems in the notebooks or on the blackboard.

- ✓ Understand the question to be solved and the learner's role in peer learning.
- ✓ Contribute according to the learner's individual strength in the group.
- ✓ Help all the members to understand and learn.
- ✓ Present information as asked in the notebook/on the blackboard to demonstrate learning.

Sample

- Group the learners in pairs.
- Let each of them read and discuss the table of geometrical features of shapes from the textbook.
- Ask all learners to make a table of their own using different shapes in the first column but without labels.
- Let each of the learners share the tables with their partners.
- Each partner must complete the table, including labelling vertices and equal sides, shape names, number of sides and names of sides.
- Conclude the learning by telling learners about labelling and naming shapes.

Questioning

What?

- ✓ Asks questions during the teaching-learning process to prompt learners to think about what is being taught and also assess the learning levels

Why?

To adjust the instructions/pace of the teaching-learning process to achieve the learning outcomes and allow the teacher to assess the class mastery in a fun and quick way.

Teacher

How to use?

Learners

- ✓ Frame different types of questions at various stages of the teaching-learning process.
- ✓ Ask questions at different intervals during the teaching-learning process.
- ✓ Based on the responses, pace the teaching-learning process.
- ✓ Change the questioning technique to build curiosity and add variety.
- ✓ Avoid yes/no type of questions.
- ✓ Use quiz as a questioning technique at the end of the chapter to know how much the learners have learnt.

- ✓ Be attentive to the instructions and the questions.
- ✓ Answer only if the learner knows the answer.
- ✓ Participate in the quiz.

Sample

- Show some everyday objects such as a book, a scale, the top of a table and so on.
- Ask the learners to tell the basic shape of each of the objects shown.
- Question the learners about each shape:
 - the number of sides
 - the number of vertices
 - the number of diagonals
- Ask the questions individually to every learner.
- Record the answers on the blackboard for every shape.
- Summarise by telling learners about the shapes and their properties.

Summarising

What?

- ✓ Presents the most important ideas in the chapter/concept in short, often in the form of a graphic organiser using keywords or key phrases

Why?

To help learners to remember and understand the most important information, and integrate the central ideas in a meaningful way

Teacher

How to use?

Learners

- ✓ Make a list of the main points for a concept, or the steps of the skill.
- ✓ Alternatively, have learners make their own list of main points.
- ✓ Ensure the keywords and phrases are highlighted.
- ✓ Where applicable, use an appropriate graphic organiser to present the information.

- ✓ Underline the keywords and phrases.
- ✓ Revise the summarised points.
- ✓ When needed, make a list of main points.

Sample

- Recall the Roman numbers from 1 to 100.
- Recall the rules for writing these Roman numerals.
- Categorise these rules by clearly stating the character and value of the Roman numeral. For example, 1 to 10.
- Show the difference between writing 4 (IV) and 6 (VI). Subtract and add with reference to 5; similarly, apply the same rule for 9 and 11 using 10 as a reference.
- Now, summarise the rules by stating the Roman values for 1, 5, 10, 50, 100 and how the other numbers are written applying the rule of adding and subtracting.
- Summarise using a mind map.

Note: Descriptions provided for samples of teaching strategies may vary from the content in the 'Transactional Tip' section of the lesson plan. Teachers need to plan on the same lines.

Graphic Organisers (Blackboard Information Organising Tips)

- Graphic organisers mostly use words or phrases and drawings at times. They help learners see and think about information in a more systematic and connected way.
- Different organisers serve different functions. Describing processes, comparing, sequencing, arranging, showing relationships are some of the functions that graphic organisers have.
- Using these helps learners to process, store and recall information and discover new relationships.

Mind map

Word splash

KWL chart

Tip chart

Table

Venn diagram

**Bubble
diagram**

Star diagram

Timeline

Process chart

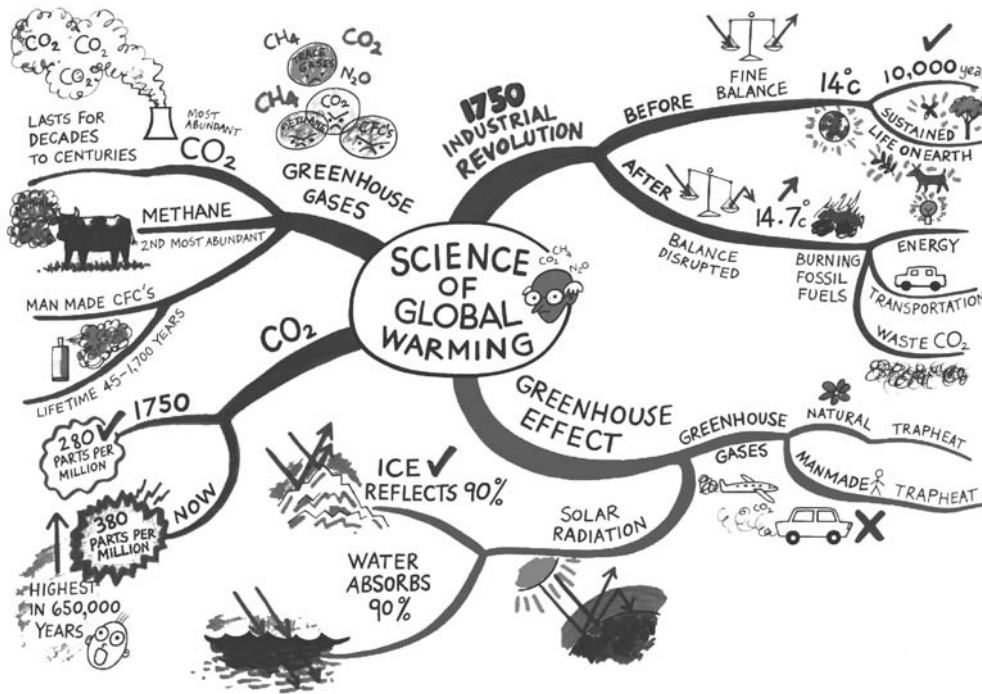
Cycle chart

Tree diagram

**Spider
diagram**

**Layered
triangle/
Pyramid**

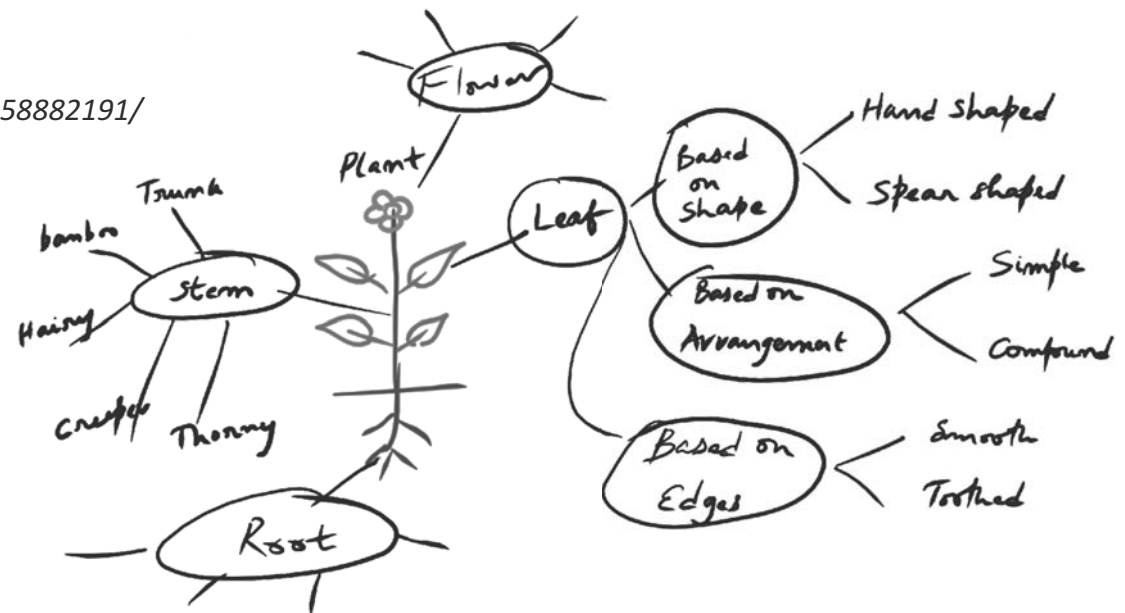
Mind map



- Useful to build connections between concepts
- Helps in understanding information and discovering new relationships

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Sample blackboard illustration:



Word splash

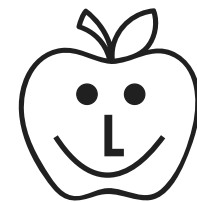
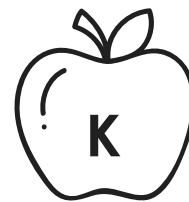


- Makes learning terminology easier for learners
- Helps make connections
- Keywords discussed can be written on the board and learners can be asked to make the connections

KWL chart

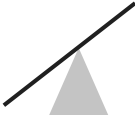
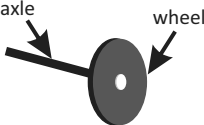


Builds outcome orientation and help learners/teachers to organise information before, during and after a lesson/activity



I know	I want to know	I have learned
Air is everywhere.	Why do we need air?	<ul style="list-style-type: none"> • We need air to breath. • Air helps in burning.

TIP chart

<u>T</u> erm	<u>I</u> nformation	<u>P</u> icture
Lever	A lever is a bar, rod or platform that can move about a fixed point.	
Wheel and axle	Wheel and axle make work easier by reducing friction. A wheel helps things to move. The axle helps the wheel turn.	



Helps learners to remember and understand complex terms with the help of pictures and information

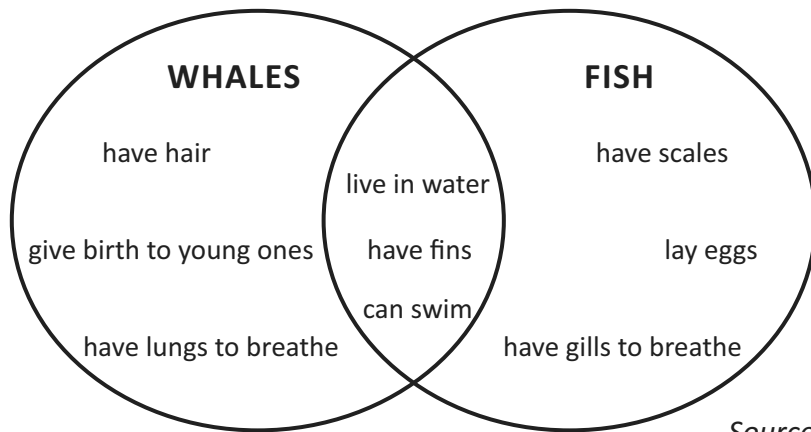
Table



- Useful to note down information after discussions and clearly bring out points about different things from different perspectives
- Helps build modular thinking ability in learners

Planet	Key Feature	No. of Moons	Position from the Sun
Mercury	Smallest planet	Zero	1 st
Venus	---	---	---
Earth	---	---	---

Venn diagram



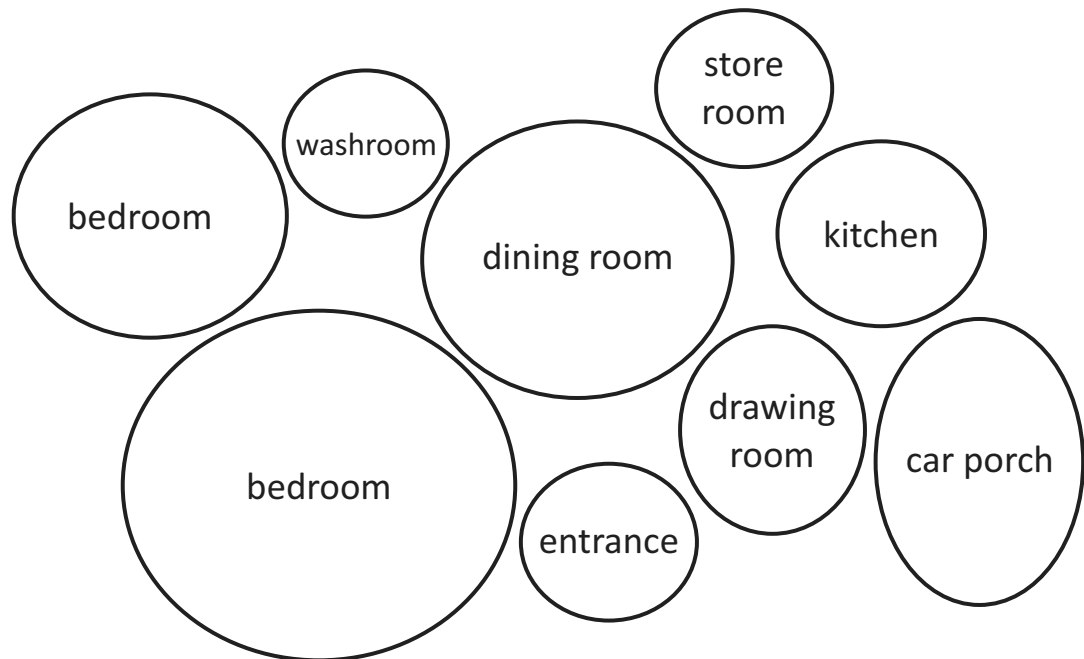
- Useful for remembering logical relationships between groups of things
- Can be used to indicate what is common and what is different between two things or groups of things

Source: <http://www.learnnc.org/lp/pages/2646>

Bubble diagram



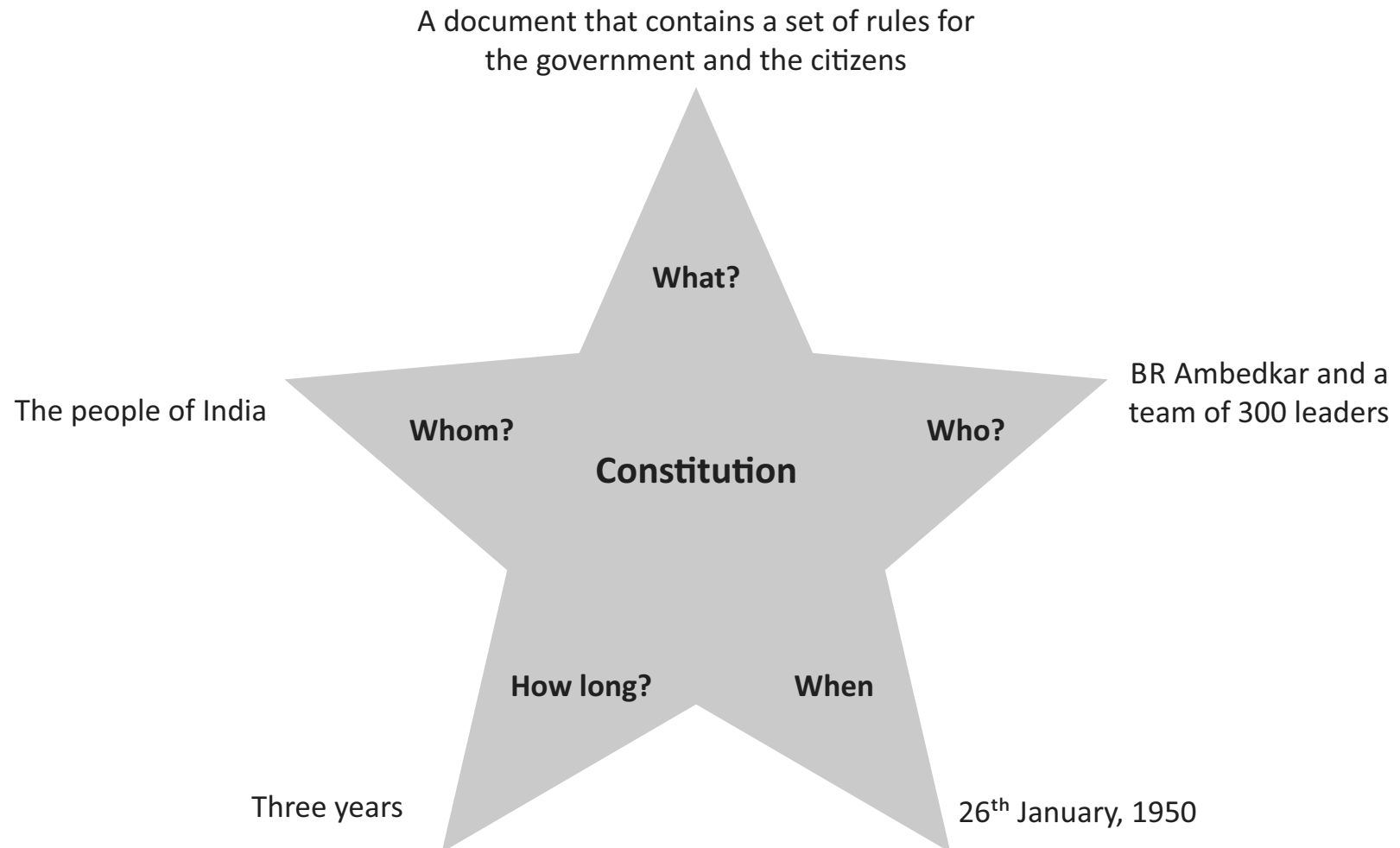
Can be used to visualise the components of a concept along with their relative sizes, quantity and connections between them



Star diagram



Can be used to describe the key points of a story or event using the 5Ws

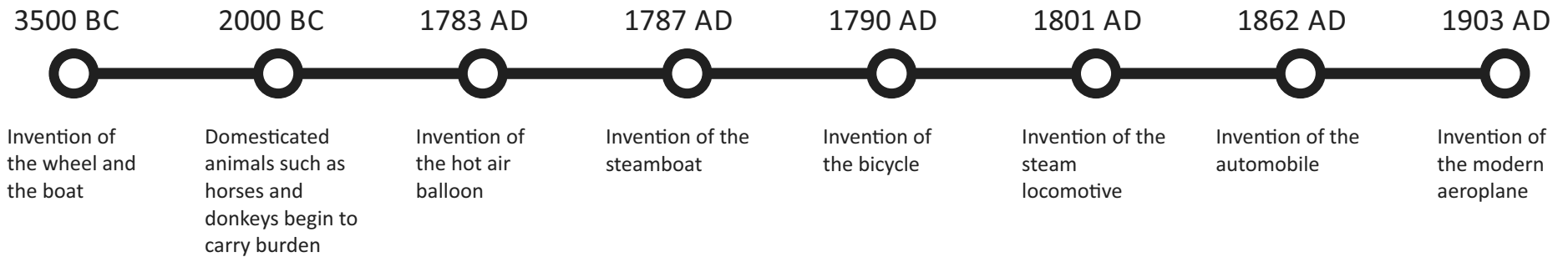


Timeline

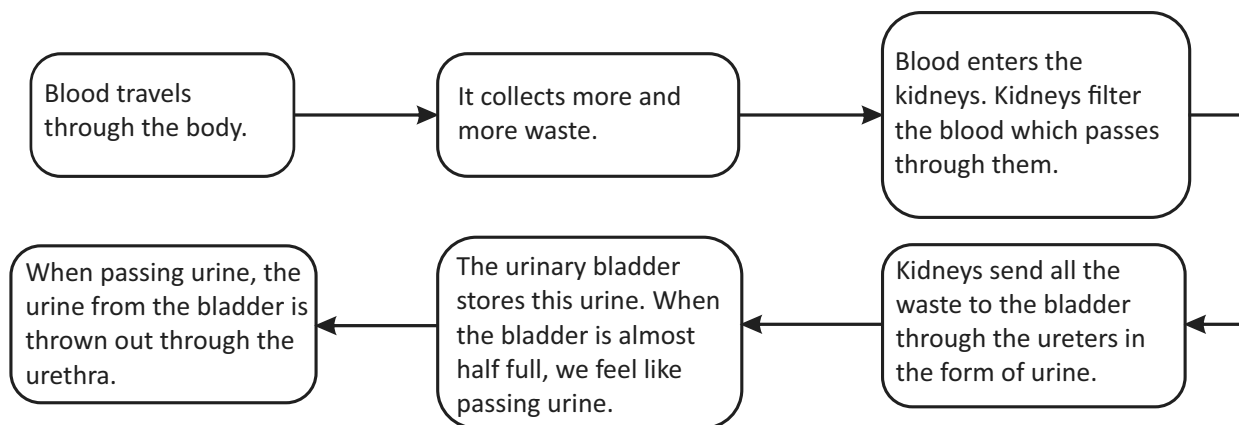


Useful to recall events in chronological order with dates

Timeline of evolution of transportation

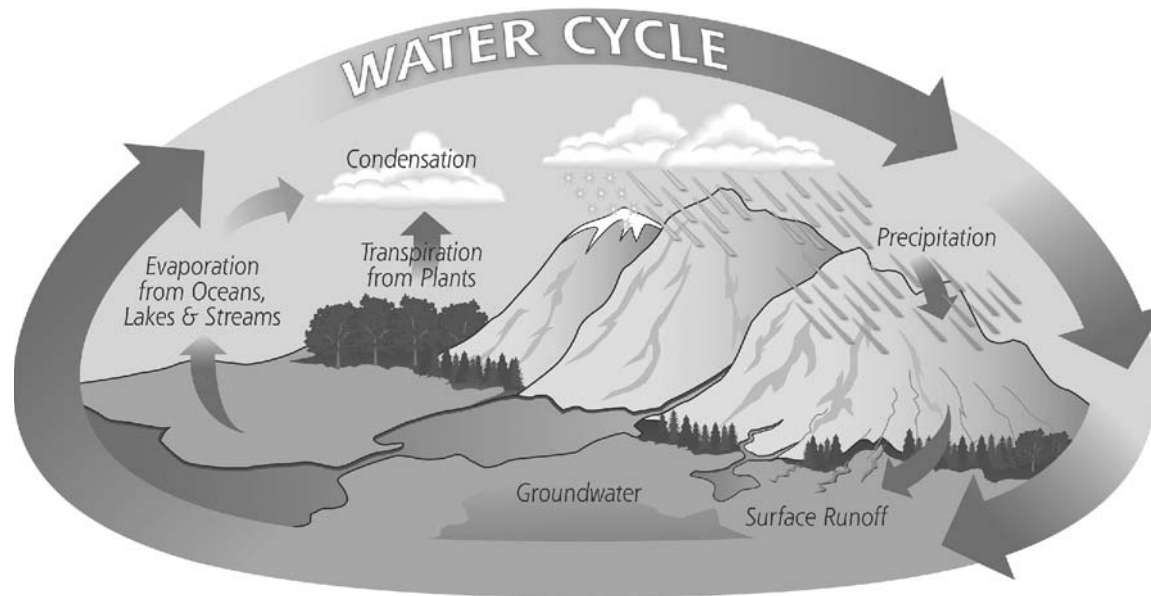


Process chart



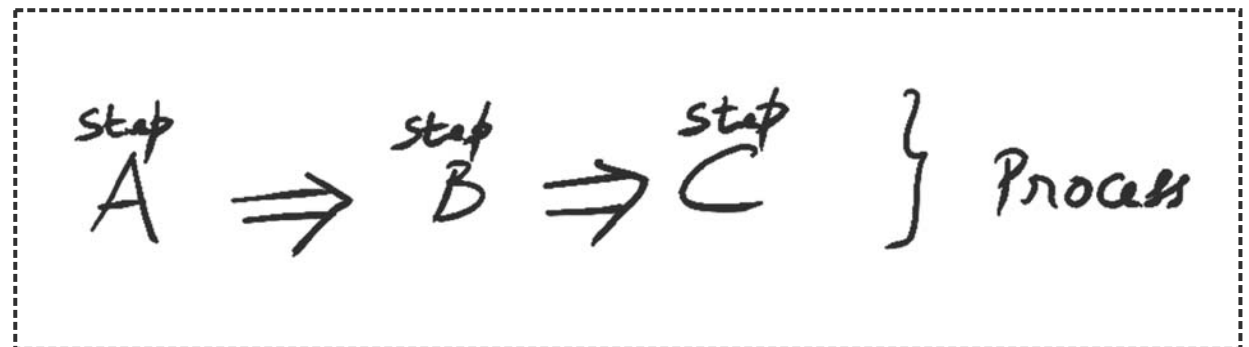
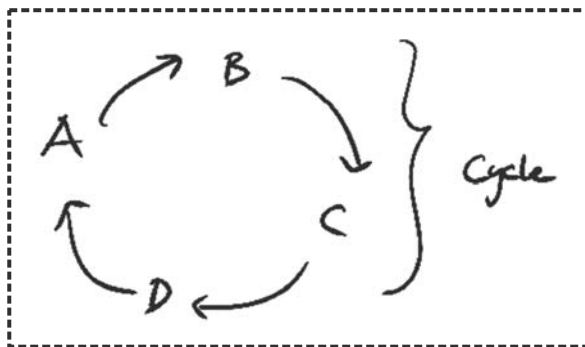
Useful to represent and remember information that follows a particular sequence

Cycle chart

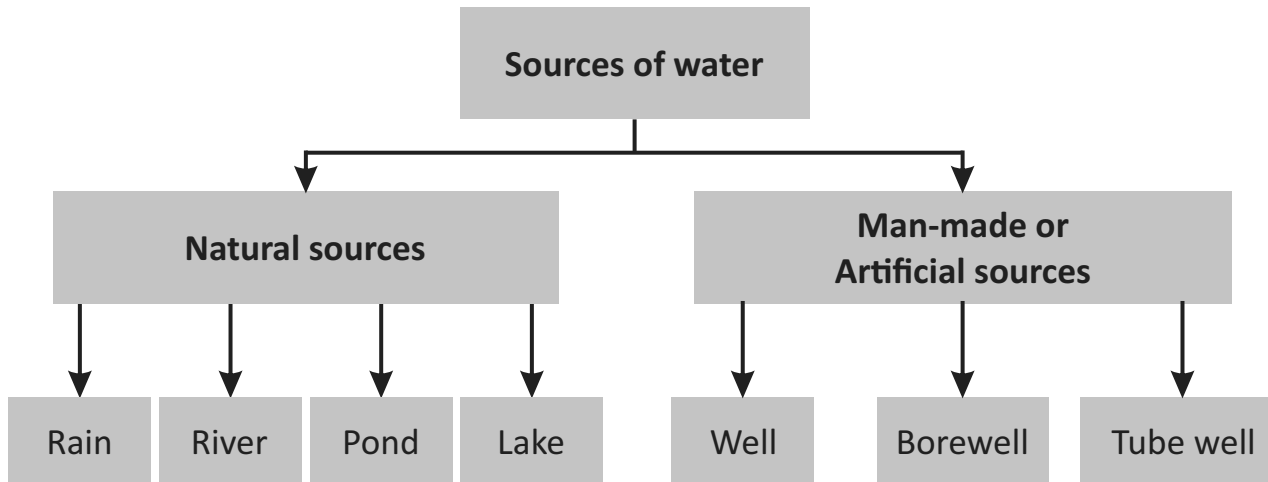


- Useful to represent and remember information that follows a particular sequence
- Both open-ended simple process or closed cycles can be used

Sample blackboard illustrations:



Tree diagram

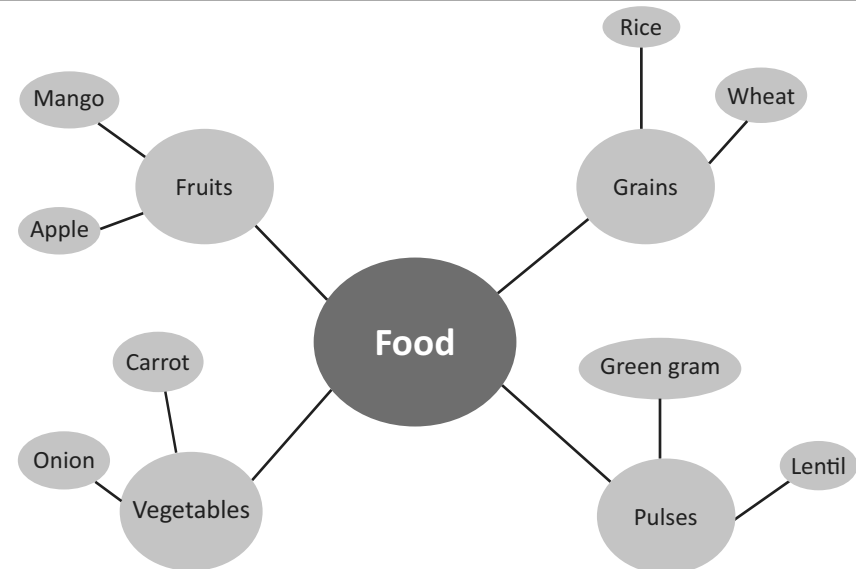


Helps in classifying or categorising information

Spider diagram



- Useful to represent and remember complex topics
- Useful to build connections within a concept or between concepts

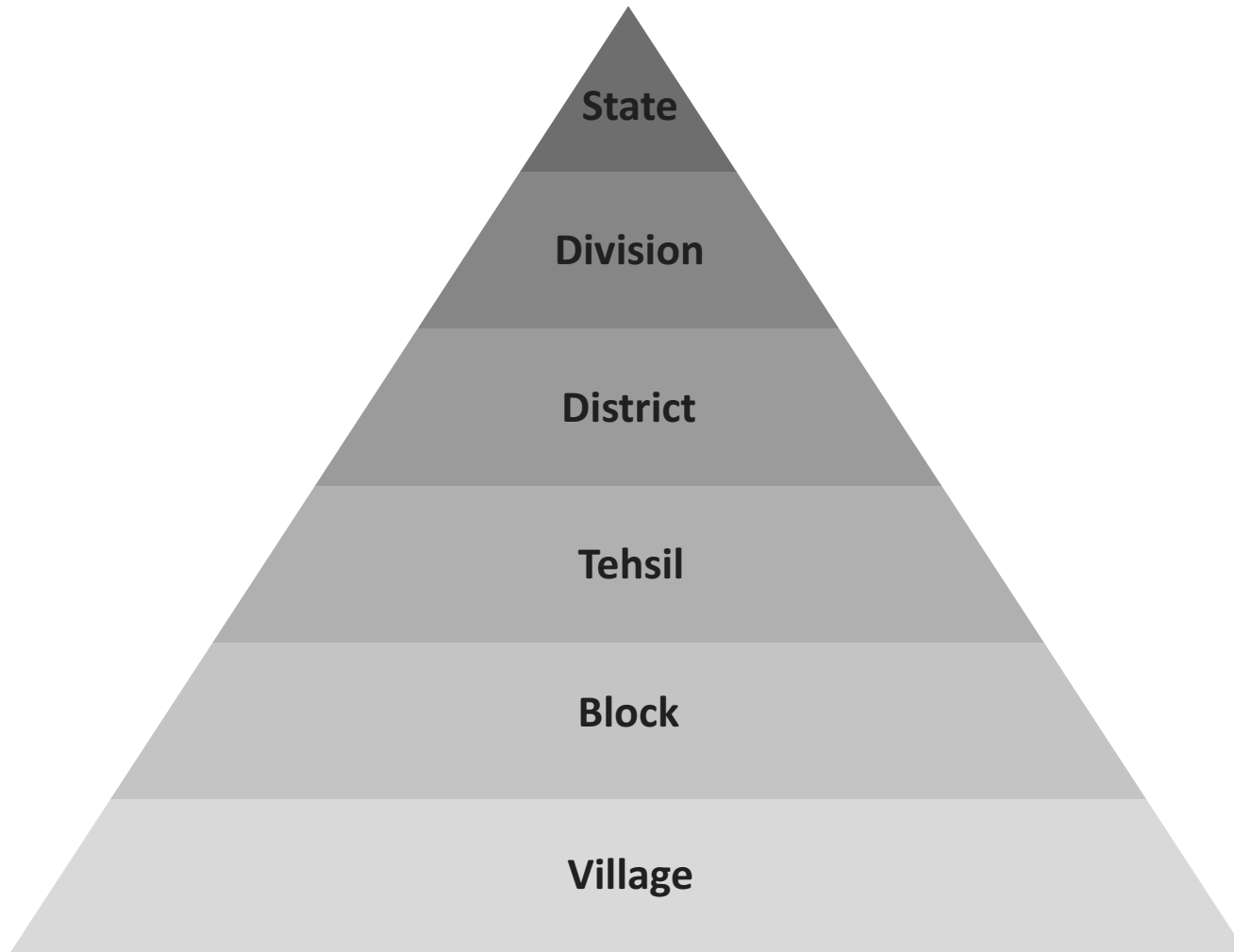


Layered triangle/Pyramid

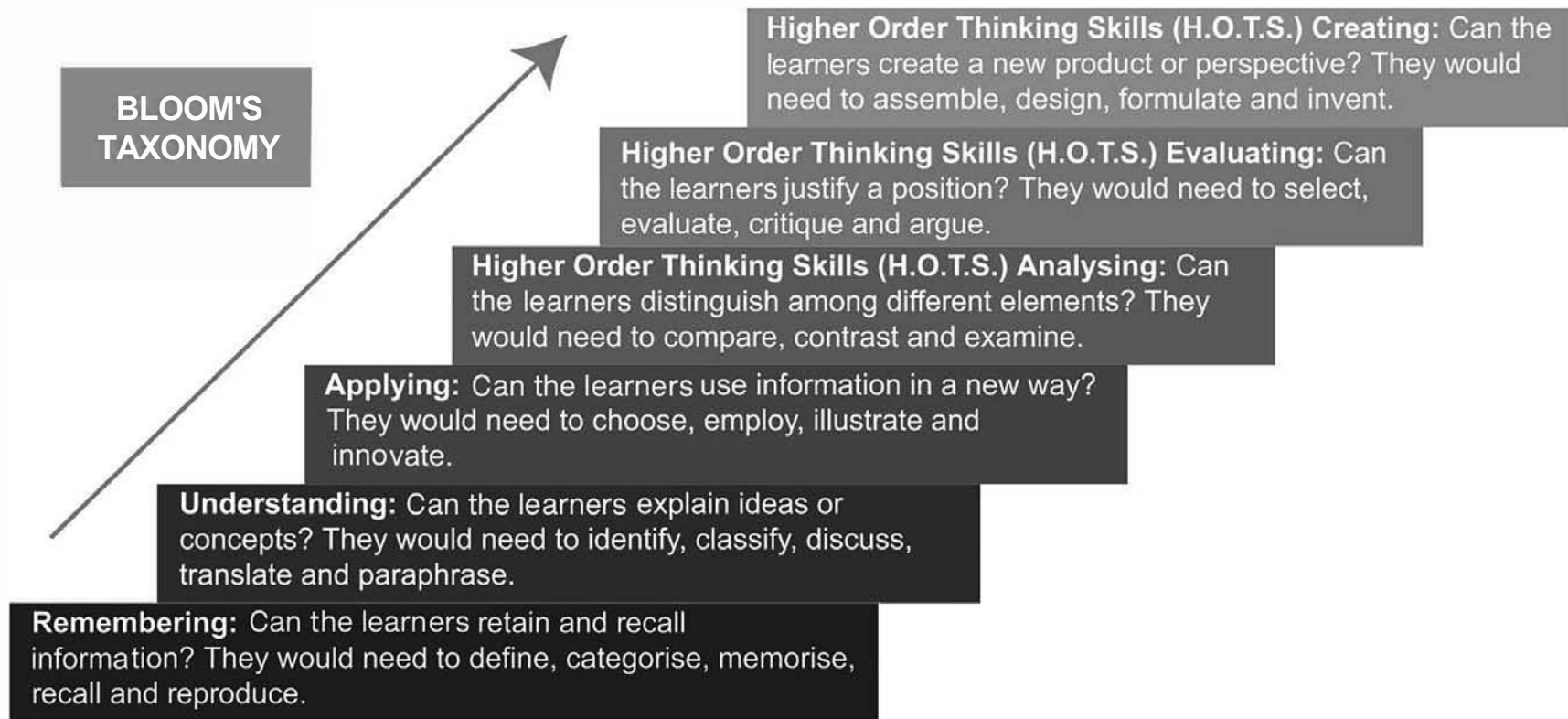


- Can be used to start with a broad topic and move to a more focussed or complex topic
- Can be used to start with a basic topic and move to a more evolved/complex topic

Structure of State Administration



Bloom's Taxonomy in Class



Grade 5 Maths 2 Part								
Part	Chapter No.	Chapter Name	Concept Number	Concept Name	Teaching Days	Exam Syllabus		
						FA Coverage	SA Coverage	PA Coverage
1	1	Shapes	1.1	Identify and Classify Angles	5	FA1	SA1	PA1
1	1	Shapes	1.2	Nets and Views of Solids	4	FA1	SA1	PA1
1	2	Patterns	2.1	Patterns in Rotation	4	FA1	SA1	PA1
1	2	Patterns	2.2	Patterns in Numbers	3	FA1	SA1	PA1
1	3	Large Numbers	3.1	Indian and International Systems of Numeration	6	FA1	SA1	PA1
1	3	Large Numbers	3.2	Roman Numerals	5	FA2	SA1	PA1
1	4	Addition and Subtraction	4.1	Add and Subtract Large Numbers	3	FA2	SA1	PA1
1	5	Multiplication	5.1	Multiply Large Numbers	6	FA2	SA1	X
1	6	Division	6.1	Divide Large Numbers	7	FA2	SA1	X
1	6	Division	6.2	Factors and Multiples	6	X	SA1	X
1	6	Division	6.3	H.C.F. and L.C.M.	6	X	SA1	X
1	7	Time	7.1	Convert Time	3	X	SA1	X
1	7	Time	7.2	Add and Subtract Time	3	X	SA1	X
2	8	Money	8.1	Unitary Method in Money	3	FA3	SA2	PA2
2	9	Fractions - I	9.1	Equivalence of Fractions	3	FA3	SA2	PA2
2	9	Fractions - I	9.2	Fraction in its Lowest Terms	4	FA3	SA2	PA2

Notes:

1) SA1 = MYA, SA2 = AA

2) Please utilise available classroom time for practice on MathBuddy to provide additional and engaging maths practice to students.

This will also facilitate their performance during assessment.

Grade 5 Maths 2 Part								
Part	Chapter No.	Chapter Name	Concept Number	Concept Name	Teaching Days	Exam Syllabus		
						FA Coverage	SA Coverage	PA Coverage
2	9	Fractions - I	9.3	Compare Unlike Fractions	3	FA3	SA2	PA2
2	9	Fractions - I	9.4	Add and Subtract Unlike Fractions	4	FA3	SA2	PA2
2	10	Fractions - II	10.1	Add and Subtract Mixed Fractions	4	FA3	SA2	PA2
2	10	Fractions - II	10.2	Multiply Fractions	4	FA4	SA2	PA2
2	10	Fractions - II	10.3	Reciprocals of Fractions	4	FA4	SA2	PA2
2	11	Decimal - I	11.1	Like and Unlike Decimals	4	FA4	SA2	X
2	11	Decimal - I	11.2	Compare and Order Decimals	5	FA4	SA2	X
2	11	Decimal - I	11.3	Add and Subtract Decimals	5	FA4	SA2	X
2	12	Decimal - II	12.1	Multiply and Divide Decimals	5	X	SA2	X
2	12	Decimal - II	12.2	Percentages	6	X	SA2	X
2	13	Measurements	13.1	Perimeter, Area and Volume	5	X	SA2	X
2	14	Data Handling	14.1	Circle Graphs	3	X	SA2	X

Notes:

1) SA1 = MYA, SA2 = AA

2) Please utilise available classroom time for practice on MathBuddy to provide additional and engaging maths practice to students. This will also facilitate their performance during assessment.

Annual Planning Tool for Teachers (to be filled as per Term/Semester)

Month	No of Working Days in School	Assessments (If Any)	Other Non-Teaching Events if Any	No of Teaching Days in School	No of "Teaching Periods" based on the Subject Time-Table (Referred to as "Teaching Days" going forward)	Lesson/Concept List to be Covered	CK Teaching Days Total	Days Allocated for CK PRS	Buffer Days
Sample Month	20	None	Opening PTM (1 Day)	19	25	1, 2, 3	16	7	2
April									
May									
June									
July									
August									
September									
October									
November									
December									
January									
February									
March									

Assessment Blueprint - Maths - Beginner FA_20M

Question Source	Summary
DIRECT	Direct questions from TB/WB
DIRECT PLUS	DIRECT questions with minor changes.
MODIFIED	DIRECT questions with changes in skill and/or question type
MODIFIED PLUS	MODIFIED questions with increased difficulty
TWISTED	NEP/BOARD question types based on TB/WB content

Maths - Class 5

			<i>Beginner</i>	<i>Values</i>
			20M	
<i>Section Name</i>	<i>Section Heading</i>	<i>Question Source</i>	No. of Questions	Marks
A	Multiple Choice Questions	DirectPlus	2	2
		Modified		
B	Very Short Answer Questions	DirectPlus	5	5
		Modified		
C	Short Answer Questions	DirectPlus	1	2
		Modified	2	4
D	Long Answer Questions	Modified	2	4
E	Graphic Organisers	Modified	1	3
Grand Total			13	20

1. This exam blueprint is for reference only. Actual exam pattern may vary slightly.
2. In most cases, there is external choice for long answers type questions.

Assessment Blueprint - Maths - Beginner PA_40M

Maths - Class 5

			<i>Beginner</i>	<i>Values</i>
			40M	
<i>Section Name</i>	<i>Section Heading</i>	<i>Question Source</i>	No. of Questions	Marks
A	Multiple Choice Questions	DirectPlus	3	3
B	Very Short Answer Questions	DirectPlus	7	7
C	Short Answer Questions	DirectPlus	4	8
		Modified	1	2
D	Graphic Organisers	Modified	2	8
E	Long Answer Questions	Modified	6	12
Grand Total			23	40

1. This exam blueprint is for reference only. Actual exam pattern may vary slightly.
2. In most cases, there is external choice for long answers type questions.

Assessment Blueprint - Maths - Beginner MYA/AA_40M

Maths - Class 5

			<i>Beginner</i>	<i>Values</i>
			40M	
<i>Section Name</i>	<i>Section Heading</i>	<i>Question Source</i>	<i>No. of Questions</i>	<i>Marks</i>
A	Multiple Choice Questions	DirectPlus	3	3
		Modified	1	1
B	Very Short Answer Questions	DirectPlus	6	6
		Modified	2	2
C	Short Answer Questions	DirectPlus	5	10
		Modified	3	6
D	Graphic Organisers	Modified	1	4
E	Long Answer Questions	Modified	4	8
Grand Total			25	40

1. This exam blueprint is for reference only. Actual exam pattern may vary slightly.
2. In most cases, there is external choice for long answers type questions.

Assessment Blueprint - Maths - Beginner MYA/AA_50M

Maths - Class 5

			<i>Beginner</i>	<i>Values</i>
			50M	
<i>Section Name</i>	<i>Section Heading</i>	<i>Question Source</i>	No. of Questions	Marks
A	Multiple Choice Questions	DirectPlus	5	5
B	Very Short Answer Questions	DirectPlus	9	9
C	Short Answer Questions	DirectPlus	5	10
		Modified	1	2
D	Graphic Organisers	Modified	2	8
E	Long Answer Questions	Modified	8	16
Grand Total			30	50

1. This exam blueprint is for reference only. Actual exam pattern may vary slightly.
2. In most cases, there is external choice for long answers type questions.

Assessment Blueprint - Maths - Beginner MYA/AA_80M

Maths - Class 5

			<i>Beginner</i>	<i>Values</i>
			80M	
<i>Section Name</i>	<i>Section Heading</i>	<i>Question Source</i>	<i>No. of Questions</i>	<i>Marks</i>
A	Multiple Choice Questions	DirectPlus	6	6
		Modified	4	4
B	Very Short Answer Questions	DirectPlus	10	10
		Modified	4	4
C	Short Answer Questions	DirectPlus	7	14
		Modified	5	10
D	Graphic Organisers	Modified	3	12
E	Long Answer Questions	DirectPlus	2	4
		Modified	4	8
		ModifiedPlus	4	8
Grand Total			49	80

1. This exam blueprint is for reference only. Actual exam pattern may vary slightly.
2. In most cases, there is external choice for long answers type questions.

Assessment Blueprint - Maths - Proficient FA_20M

Maths - Class 5

			<i>Proficient</i>	<i>Values</i>
			20M	
<i>Section Name</i>	<i>Section Heading</i>	<i>Question Source</i>	<i>No. of Questions</i>	<i>Marks</i>
A	Multiple Choice Questions	DirectPlus	1	1
		Modified	1	1
		Twisted	1	2
B	Very Short Answer Questions	DirectPlus	2	2
		Modified	2	2
C	Short Answer Questions	DirectPlus	1	2
		Modified	1	2
D	Long Answer Questions	ModifiedPlus	4	8
Grand Total			13	20

1. This exam blueprint is for reference only. Actual exam pattern may vary slightly.
2. In most cases, there is external choice for long answers type questions.

Assessment Blueprint - Maths - Proficient PA_40M

Maths - Class 5

			<i>Proficient</i>	<i>Values</i>
			40M	
<i>Section Name</i>	<i>Section Heading</i>	<i>Question Source</i>	No. of Questions	Marks
A	Multiple Choice Questions	DirectPlus	1	1
		Modified	2	2
		ModifiedPlus	1	1
		Twisted	1	4
B	Very Short Answer Questions	DirectPlus	2	2
		Modified	5	5
		ModifiedPlus	1	1
C	Short Answer Questions	DirectPlus	2	4
		Modified	2	4
D	Long Answer Questions	DirectPlus	2	4
		ModifiedPlus	6	12
Grand Total			25	40

1. This exam blueprint is for reference only. Actual exam pattern may vary slightly.
2. In most cases, there is external choice for long answers type questions.

Assessment Blueprint - Maths - Proficient MYA/AA_40M

Maths - Class 5

			<i>Proficient</i>	<i>Values</i>
			40M	
<i>Section Name</i>	<i>Section Heading</i>	<i>Question Source</i>	<i>No. of Questions</i>	<i>Marks</i>
A	Multiple Choice Questions	DirectPlus	1	1
		Modified	1	1
		ModifiedPlus	2	2
		Twisted	1	4
B	Very Short Answer Questions	DirectPlus	6	6
		Modified	2	2
C	Short Answer Questions	DirectPlus	2	4
		Modified	2	4
D	Long Answer Questions	Modified	3	4
		ModifiedPlus	5	12
Grand Total			25	40

1. This exam blueprint is for reference only. Actual exam pattern may vary slightly.
2. In most cases, there is external choice for long answers type questions.

Assessment Blueprint - Maths - Proficient MYA/AA_50M

Maths - Class 5

			<i>Proficient</i>	<i>Values</i>
			50M	
<i>Section Name</i>	<i>Section Heading</i>	<i>Question Source</i>	<i>No. of Questions</i>	<i>Marks</i>
A	Multiple Choice Questions	DirectPlus	3	3
		Modified	1	1
		Twisted	1	4
B	Very Short Answer Questions	DirectPlus	5	5
		Modified	2	2
		ModifiedPlus	1	1
C	Short Answer Questions	DirectPlus	3	6
		Modified	3	6
		ModifiedPlus	1	2
D	Long Answer Questions	Modified	3	8
		ModifiedPlus	7	12
Grand Total			30	50

1. This exam blueprint is for reference only. Actual exam pattern may vary slightly.
2. In most cases, there is external choice for long answers type questions.

Assessment Blueprint - Maths - Proficient MYA/AA_80M

Maths - Class 5

			<i>Proficient</i>	<i>Values</i>
			80M	
<i>Section Name</i>	<i>Section Heading</i>	<i>Question Source</i>	<i>No. of Questions</i>	<i>Marks</i>
A	Multiple Choice Questions	DirectPlus	3	3
		Modified	2	2
		ModifiedPlus	1	1
		Twisted	1	4
B	Very Short Answer Questions	DirectPlus	5	5
		Modified	8	8
		ModifiedPlus	1	1
C	Short Answer Questions	DirectPlus	6	12
		Modified	7	14
		ModifiedPlus	5	10
D	Long Answer Questions	Modified	4	8
		ModifiedPlus	6	12
Grand Total			49	80

1. This exam blueprint is for reference only. Actual exam pattern may vary slightly.
2. In most cases, there is external choice for long answers type questions.

Teaching Aids List (For Planning)

Type of Teaching Aid	Name of the Teaching Aid	Concept Used in
KLO Resource	Geoboard chart of Angles	1.1: Identify and Classify Angles
	Place Value Cards	3.1: Indian and International Systems of Numeration
	Place Value Board	3.1: Indian and International Systems of Numeration
	chart of Multiplication Table	5.1: Multiply Large Numbers
	chart of Solid Figures	1.2: Nets and Views of Solids
Learners to bring	protractor, scale, scissors	1.1: Identify and Classify Angles
Teacher to arrange	cut-outs of different types of triangle, rubber bands (for Geoboard)	1.1: Identify and Classify Angles
	cut-outs of shapes, nets of cubes, cuboids, cylinders and cones, Glass, notebook	1.2: Nets and Views of Solids
	cut-outs from magazines of some symmetric and asymmetric pictures and alphabets, playing cards, cut-out of a battery, pebbles/stones, calendar	2.1: Patterns in Rotation
Storyweaver resource	How Old is Muttajji? https://storyweaver.org.in/stories/4772-dum-dum-a-dum-biryani	4.1: Add and Subtract Large Numbers
	The Fascinating Fibonacci https://storyweaver.org.in/stories/5619-the-fascinating-fibonaccis	2.2: Patterns in Numbers

Teaching Aids List (For Planning)

Type of Teaching Aid	Name of the Teaching Aid	Concept Used in
Online Resource	Flash cards of Fractions	9.4: Add and Subtract unlike fractions
	Number Strip	9.4: Add and Subtract unlike fractions 10.1: Add and Subtract Mixed Fractions 10.2: Multiply Fractions 10.3: Reciprocals of Fractions 11.3: Add and Subtract Decimals
	Grid Board	9.4: Add and Subtract unlike fractions 10.1: Add and Subtract Mixed Fractions 10.2: Multiply Fractions 10.3: Reciprocals of Fractions
	Decimal System Chart	11.1: Like and Unlike Decimals 11.2: Compare and Order Decimals
	Geoboard	13.1: Perimeter, Area and Volume
	Area, Perimeter, Volume and Nets chart	13.1: Perimeter, Area and Volume
Teacher to arrange	Flash cards with fraction and reciprocals	10.3: Reciprocals of Fractions
	Rubik's Cube	13.1: Perimeter, Area and Volume
Storyweaver resource	Dum Dum-a-Dum Biryani! https://storyweaver.org.in/stories/4772-dum-dum-a-dum-biryani	12.1: Multiply and Divide Decimals



LESSON PLANS AND TEACHER REFERENCE MATERIAL

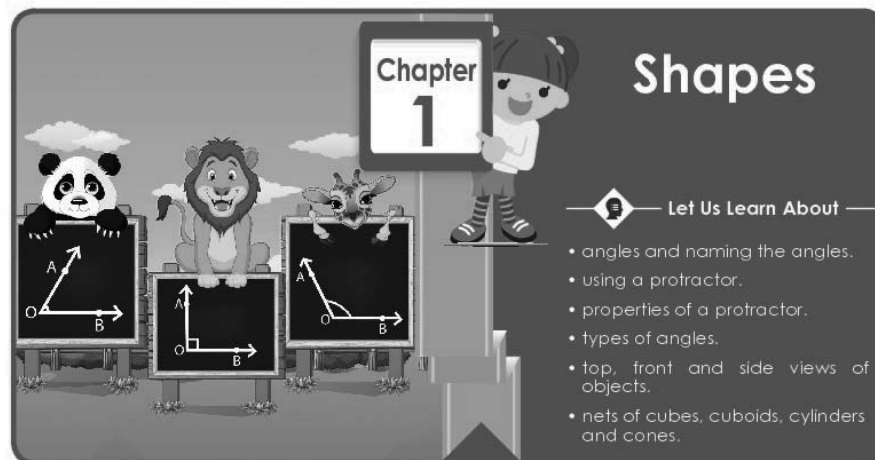
A – Curriculum to Learning Objectives: Geometry

Prior Knowledge		• <i>basic shapes and figures, vertices</i>				
Class	Ch. No.	Chapter Name	C. No.	Concept Name	L. Obj. No.	Learning Objectives
1	1	Shapes	1.1	Understand Spatial Words	1.1.a	• basic flat and solid figures
					1.1.b	• corners and sides of objects/figures
					1.1.c	• outlines of the bases of the objects
2	1	Shapes	1.1	Identify the Geometrical Features of Objects	1.1.a	• lines, open figures and closed figures
					1.1.b	• drawing figures using lines
					1.1.c	• basic flat and solid figures
					1.1.d	• flat figures as outlines of the surfaces of solid figures
3	1	Shapes	1.1	Vertices and Diagonals of Two-dimensional Shapes	1.1.a	• identifying 2D shapes with straight and curved lines
					1.1.b	• identifying sides, corners and diagonals
					1.1.c	• making a tangram
					1.1.d	• recognising 3D shapes and their faces and edges
4	1	Shapes	1.1	Circle and its Parts	1.1.a	• circle and its parts
			1.2	Reflection and Symmetry	1.1.b	• drawing a circle
					1.2.a	• reflection and symmetry in figures
					1.2.b	• tessellation and tiling
5	1	Shapes	1.1	Identify and Classify Angles	1.1.a	• angles and naming the angles
					1.1.b	• using a protractor
					1.1.c	• properties of a protractor
					1.1.d	• types of angles

B – Vision-to-Action Plan: 1.1 Identify and Classify Angles

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
1 DD/MM/YYYY	1, 2 – THK, RCL	1.1.a	<ul style="list-style-type: none"> Recall the terms – point, line, line segment and ray. Make a geoboard to show various 2-dimensional figures. 	<ul style="list-style-type: none"> Activity Method 	<ul style="list-style-type: none"> geoboard 	–	–	
2 DD/MM/YYYY	2, 3 – REM/UND	1.1.a	<ul style="list-style-type: none"> Show different angles made by intersecting lines using geoboard. Identify an angle and name different angles. 	<ul style="list-style-type: none"> Activity Method Guided Learning 	<ul style="list-style-type: none"> geoboard rubber bands 	WB: Pg. 2 (Q. 7-9)	WB: Pg. 1 (Q. 1-3)	
3 DD/MM/YYYY	3-6 – REM/UND	1.1.b, 1.1.c, 1.1.d	<ul style="list-style-type: none"> Measure angles using a protractor. Identify different types of angles. 	<ul style="list-style-type: none"> Peer Learning Guided Learning 	<ul style="list-style-type: none"> protractor Chart of Angles 	TB: Pg. 4 (Example 2) WB: Pg. 2 (Q. 10- 12, 14)	WB: Pg. 1 (Q. 4-6)	
4 DD/MM/YYYY	6, 7 – APP	1.1.d	<ul style="list-style-type: none"> Identify and measure angles in real-life objects. Measure different angles made by letters of the alphabet series and hands of a clock. 	<ul style="list-style-type: none"> Using Concrete Material Activity Method 	<ul style="list-style-type: none"> Protractor 	TB: Pgs. 6, 7 (Examples 4, 5) WB: Pg. 2 (Q. 13)	WB: Pgs. 3, 4 (Q. 15-17) WB: Pgs. 5, 6 (Q. 18-20)	

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
5 DD/MM/YYYY	7, 8 – HOTS, Drill Time	1.1.d	<ul style="list-style-type: none"> Calculate the sum of the angles of a triangle. 	<ul style="list-style-type: none"> Using Concrete Material Questioning 	<ul style="list-style-type: none"> cut-outs of different types of triangles 	TB: Pgs. 7, 8 (Examples 6, 7) TB: Pg. 15, (Drill Time, Q. 1, 2)	WB: Pg. 7 (Q. 21, 22)	



Concept 1.1: Identify and Classify Angles

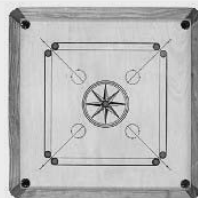


Think

Pooja was playing carrom with her friends. Each time she struck a coin, Pooja observed that the striker followed a straight path.

She wondered if there is any way she could use her knowledge of mathematics to master the game.

Do you also want to know?



Recall

Let us recall what we have learnt in the previous class.

Important Words

Duration: 1 min

- **Today:** point, line segment, ray, line, one-dimensional figure

Transactional Tip(s)

Duration: 27 min



Activity Method:

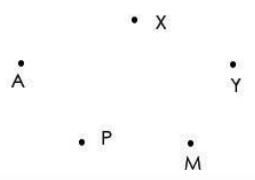
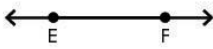

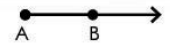
- Instruct learners to use the Classklap geoboards. Otherwise, arrange for materials for making a geoboard.
- Explain the steps involved in making a geoboard. Demonstrate each step to the class.
- Ask learners to show the 2-dimensional figures from TB: Pg. 2 on the geoboard. E.g., 1 pin is a point. Rays and lines extend to the edge to show infinite length.
- Discuss the terms – 'point', 'line', 'ray', 'line segment' and 'one-dimensional'.

Class Pulse Check

Duration: 2 min



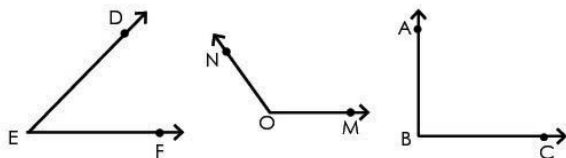
- 1) What is the difference between a line and a line segment?
- 2) What is the difference between a line segment and a ray?

Object	Features	Representation
Point	A point is an exact location in space. It has no length, width or thickness. A point is denoted by a capital letter of the English alphabet. For example, A, X, Y, P and M are points.	
Line	Many points, placed close to each other in a straight path, form a line. It has no thickness or breadth. It has only length. So, it is called a one-dimensional figure . A line has no end points. It can be extended on both the sides.	 <p>We mark two points E and F on a line and write it as \overleftrightarrow{EF} or \overleftrightarrow{FE}. It is read as line EF.</p>
Line segment	A line segment is a part of a line. It has two end points. A line segment has a definite length.	 <p>We write a line segment AB as \overline{AB}. It is read as segment AB, or BA.</p>
Ray	A ray is a part of a straight line which has a starting point called the initial point but no end point. It can be extended only in one direction.	 <p>We write ray AB as \overrightarrow{AB}. It is read as ray AB. We cannot read it as ray BA.</p>



Remembering and Understanding

Consider the following figures.



These figures are formed by two rays with the same initial point. Such figures are called **angles**.

Important Words

Duration: 1 min

- **Last class:** point, line segment, ray, line, one-dimensional figure
- **Today:** angle

Transactional Tip(s)

Duration: 15 min



Activity Method:

- Use an Classklap geoboard and rubber bands to make figures as shown in TB: Pg. 2, 3,
- 'Remembering and Understanding'. Show how angles are formed by two rays.
- Now draw the same figures on the blackboard and show how to name an angle.
- Draw several intersecting line segments on the blackboard as given in TB: Pg. 2. Show the different angles made by the lines at the intersection. Ask learners to name and denote the angles verbally and also note down in their notebooks.
- Solve and discuss WB: Pg. 2, Q. 7-9.

Class Pulse Check

Duration: 2 min



- 1) When two line segments meet each other at a point what is formed between the line segments?
- 2) The common initial point of the two rays is called

Angle: The figure form by two rays sharing common initial point is called an **angle**. Angles are also formed when two line segments cut each other.

The common initial point of the two rays is called its **vertex**. The two rays are called the **arms** of the angle.

Naming an angle

Consider the angle shown.

The symbol of an angle is \angle . In the given angle, the common point is E.

So, the angle is denoted as $\angle DEF$, $\angle FED$ or $\angle a$.

Example 1: Name any nine angles in the figure.

Solution: In the given figure, any nine angles are:

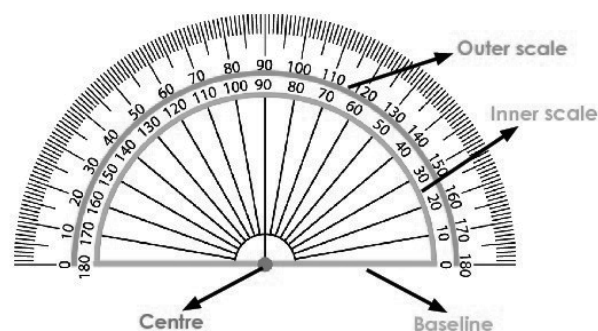
$\angle POQ$, $\angle QOS$, $\angle SOR$, $\angle ROT$, $\angle TOP$, $\angle POS$, $\angle POR$, $\angle SOT$, $\angle QOR$

The unit used to represent the measure of an angle is the **degree**. It is denoted using the symbol $^\circ$.

We can also consider an angle as the movement of a ray (called the **initial ray**, OA) through some distance to another position (called the **final ray**, OB).

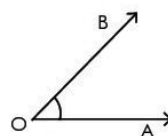
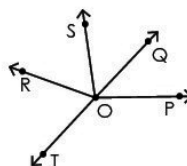
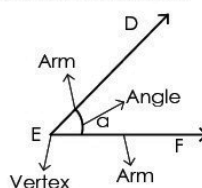
In other words, the distance through which a ray moves from an initial position to the final position is called an **angle**.

Protractor



We use a protractor to measure angles. Let us first observe the protractor and understand how to measure angles.

The protractor has markings from 0 to 180 from the left and the right. The distance between 0 and 180 is divided into 180 small divisions. Each division is called a **degree**.



Important Words

Duration: 1 min

- Today:** degree, initial ray, final ray, measure of angle, vertex, arms

Transactional Tip(s)

Duration: 10 min



Guided Learning:

- Explain the different parts of an angle. Point out the vertex and the arms of an angle.
- Explain angles and naming of angles using TB: Pg. 2, 3.
- Ask learners to name different angles drawn on the blackboard via random calling.
- Show how to write the angle name using the correct symbol as shown in TB: Pg. 3, Example 1.

Class Pulse Check

Duration: 1 min



- Name the unit used to represent the measure of an angle.

So, we can measure angles from 0° to 180° using a protractor.

The horizontal line on the protractor joining 0° and 180° is called the **baseline**. The mid-point of the base line is called the **centre** of the protractor.

The **outer scale** has 0° to 180° marked in clockwise direction.

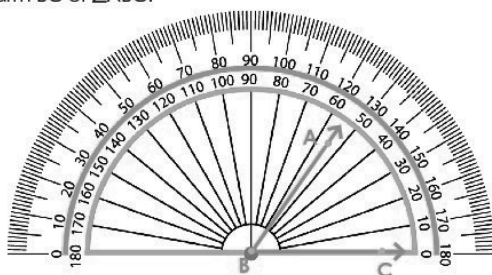
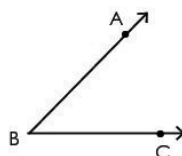
The **inner scale** has 0° to 180° marked in anticlockwise direction.

Let us understand how to measure an angle using a protractor, with the help of an example.

Example 2: Measure $\angle ABC$ using a protractor.

Solution: To measure the given angle, follow these steps.

Step 1: Place the protractor on the given angle such that its centre lies on the vertex B and the baseline lies exactly on the arm BC of $\angle ABC$.



Step 2: Observe where the arm BC points to 0. In this angle, it is on the inner scale.

Step 3: Note the reading on the outer scale through which the other arm BA of $\angle ABC$ passes. In this case, it is the 5th mark after 50.

Thus, the measure of the given angle is 55° .

Note: Always remember to measure on the scale where the arm coinciding with the baseline points to 0° .

Types of angles

The measure of an angle lies between 0° and 360° .

These angles of different measures are given different names. Let us learn about them in detail.

Important Words

Duration: 1 min

- **Last class:** angle, degree, initial ray, final ray, measure of angle, vertex, arms
- **Today:** baseline, centre, inner scale, outer scale

Transactional Tip(s)

Duration: 11 min



Peer Learning - Pair/Group:

- Show learners how a protractor looks and explain all its characteristics – inner scale, outer scale, baseline and centre.
- With the help of examples on TB: Pgs. 3, 4, show how to measure angles using a protractor.
- Ask learners to draw different angles. They will exchange their books with their partners who will measure the angles, using a protractor.
- Use TB: Pg. 4, Example 2 to show how we choose which scale (inner or outer) to use. As the angle is less than 90° , we use the scale that gives us measures less than 90° .

Class Pulse Check

Duration: 1 min




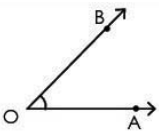
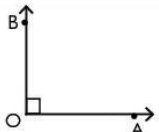
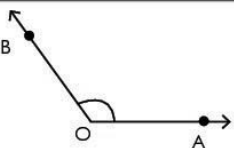
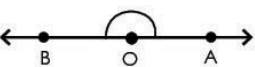
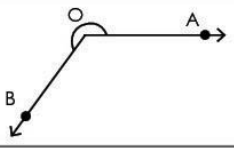

- 1) Explain and show the following features of a protractor: inner scale, outer scale, baseline and centre.

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Angles	Representation
1) Zero angle: If the initial ray does not move to any distance, no angle is formed. It is called a zero angle . It has a measure of 0° .	
2) Acute angle: If the initial ray moves to a distance such that the final ray lies between 0° and 90° , the angle formed is called an acute angle .	
3) Right angle: If the final ray lies on 90° , the angle formed between the initial ray and the final ray is called a right angle . It has a measure of 90° .	
4) Obtuse angle: If the final ray lies between 90° and 180° , the angle formed between the initial ray and the final ray is called an obtuse angle .	
5) Straight angle: If the final ray lies on 180° , the angle formed between the initial ray and the final ray is called a straight angle .	
6) Reflex angle: If the measure of angle between the initial ray and the final ray is greater than 180° , then the angle is called a reflex angle .	
7) Complete angle: If the initial ray moves to a distance and comes back to its original position, the angle formed is called a complete angle . It has a measure of 360° .	

Example 3: Identify the following angles as acute, obtuse, right, zero or straight.

65°	120°	40°	90°	135°	45°
0°	150°	50°	180°	75°	60°

Important Words

Duration: 1 min

- Today:** zero angle, acute angle, right angle, obtuse angle, straight angle, reflex angle, complete angle

Transactional Tip(s)

Duration: 14 min



Guided Learning:

- Use your arm to define and demonstrate the different types of angles as given in TB: Pg. 5 – acute, right, obtuse and straight angles. Keep one arm constant and increase the distance from the other to show acute angle, right angle, obtuse angle, straight angle, reflex angle and complete angle.
- To explain reflex and complete angles, show the Classklap Chart of Angles.
- Ask learners to name the different angles made by the minute and hour hands of a clock at different times. E.g., 4:00 a.m., 12:00 a.m., 9:25 a.m., etc.
- Ask learners to look around and find objects that make certain angles and try measuring them using protractor. E.g., corners of the desk make a right angle, an open door can make an acute, right or zero angle.
- Solve and discuss :
 - TB: Pgs.5, 6, Example 3,
 - WB: Pg. 2, Q. 11, 12, 14.

Class Pulse Check

Duration: 2 min



- What is the maximum degree of an angle that can be measured using a protractor?
- Name the different types of angles.

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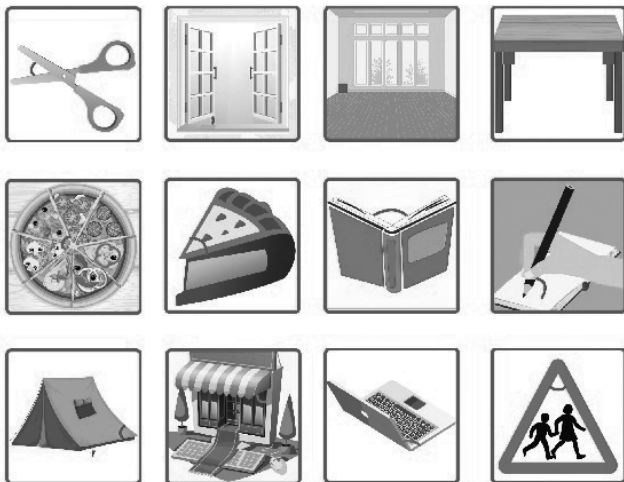
Solution:

65°	120°	40°	90°	135°	45°
Acute angle	Obtuse angle	Acute angle	Right angle	Obtuse angle	Acute angle
0°	150°	50°	180°	75°	60°
Zero angle	Obtuse angle	Acute angle	Straight angle	Acute angle	Acute angle



Application

Now that we have learnt about different types of angles, let us try to identify them in real-life objects. Here are a few pictures in which angles are marked. Identify the types of angles in these items.



Example 4: Identify the types of angles formed by the hands of each clock.

Important Words

Duration: 1 min

- **Last class:** baseline, centre, inner scale, outer scale, zero angle, acute angle, right angle, obtuse angle, straight angle, reflex angle, complete angle
- **Today:** –

Transactional Tip(s)

Duration: 15 min



Using Concrete Material:

- Before the class begins, prepare a set of everyday objects which have measurable angles. These will be used as props for the lesson. E.g., compass, scissors, tiffin box, etc.
- Ask learners to identify the angles given in TB: Pg. 6, 'Application'.
- Ask learners to measure and record the different angles made by different objects.
- Categorise each of the angles measured into zero angle/acute angle/straight angle/straight angle.
- Solve and discuss WB: Pg. 2, Q. 13.

Class Pulse Check

Duration: 1 min



- 1) If two rays make an acute angle on one side, what type of an angle is made on the other side of the acute angle?

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Important Words

–



a)



b)



c)



d)



e)



f)

Solution:

a) Acute angle

b) Obtuse angle

c) Straight angle

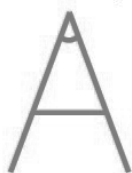
d) Right angle

e) Acute angle

f) Zero angle

Example 5:

Identify the different types of angles marked in these letters of the English alphabet.



a)



b)



c)



d)



e)

Solution:

a) Acute angle

b) Right angles

c) Acute angle and right angle

d) Straight angle

e) Acute angle and obtuse angle



Higher Order Thinking Skills (H.O.T.S.)

Let us see a few more examples of measuring angles.

Example 6:

What is the angle covered by an hour hand from 2 p.m. to 4 p.m.?

Transactional Tip(s)

Duration: 11 min



Activity Method:

- Before the class begins, arrange for chart paper and markers. Learners will need protractors.
- Use TB: Pgs. 6, 7, Examples 4, 5 (different angles marked on letters of the alphabet) as the basis for a class activity.
- Learners will make charts showing different letters of the alphabet.
- They will show the angles made by the vertices in each letter, marking the measurement and noting the type.

Class Pulse Check

Duration: 1 min



- 1) Which letter makes no angle?
- 2) What angle is formed by the hands of a clock at 9:00 p.m.?

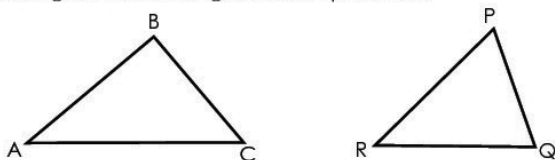
Solution: In 12 hours, the hour hand goes around the clock and so completes 360° .

In one hour, the angle covered by the hour hand = $\frac{360^\circ}{12} = 30^\circ$

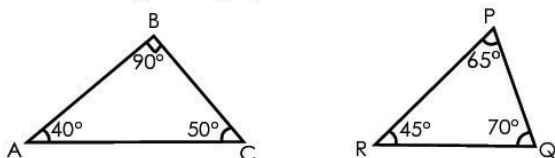
So, in two hours, the angle covered by the hour hand is $30^\circ \times 2 = 60^\circ$.

Therefore, the angle covered by the hour hand from 2 p.m. to 4 p.m. is 60° .

Example 7: In $\triangle ABC$ and $\triangle PQR$ given, find the measures of all the angles. Find the sum of the angles in each triangle and compare them.



Solution: Measure the angles using a protractor and mark them as shown in the figures.



In triangle ABC, $\angle A = 40^\circ$, $\angle B = 90^\circ$, $\angle C = 50^\circ$.

Sum of the angles = $40^\circ + 90^\circ + 50^\circ = 180^\circ$

In triangle PQR, $\angle P = 65^\circ$, $\angle Q = 70^\circ$, $\angle R = 45^\circ$.

Sum of the angles = $65^\circ + 70^\circ + 45^\circ = 180^\circ$

Comparing the sum of angles in the two triangles, we see that they are equal.

Concept 1.2: Nets and Views of Solids



Think

Pooja saw a figure in a pamphlet. It looked like the one shown here. She was curious to know how a house was drawn on a sheet of paper. Do you also want to know?



Important Words

–

Transactional Tip(s)

Duration: 29 min



Using Concrete Material:

- Before the class begins, cut triangles out of paper, one for every learner. Include different types (acute, obtuse and right triangles).
- Give two cut-outs of different types of triangles to each pair of learners.
- Ask each learner to measure all the angles of one triangle using a protractor, then find the sum of all the three angles.
- Have learners trade triangles and repeat the process.
- Learners will share and discuss their results in pairs.
- Use TB: Pg. 8, Example 7 to discuss and explain how the sum of all the interior angles of a triangle is 180 degrees.

Questioning:

- Discuss TB: Pg. 7, 8 Example 6 by drawing a clock.
- Learners answer the first few questions by drawing the hands accordingly and measuring the results, using the blank clock faces on their chart paper.
- Discuss and solve TB: Pg. 15, Drill Time, Q. 1, 2.










Class Pulse Check

Duration: 1 min



- 1) Can a triangle have more than one right angle?

C – Exit Assessment

Post-lesson Reflection							
TB completed		Yes	No	WB completed		Yes	No
Enthusiastic participation			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Concept clarity in the classroom			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Concept clarity through the workbook			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

A – Curriculum to Learning Objectives: Geometry

Prior Knowledge		• 3D shapes				
Class	Ch. No.	Chapter Name	C. No.	Concept Name	L. Obj. No.	Learning Objectives
1	1	Shapes	1.1	Understand Spatial Words	1.1.a	• basic flat and solid figures
					1.1.b	• corners and sides of objects/figures
					1.1.c	• outlines of the bases of the objects
2	1	Shapes	1.1	Identify the Geometrical Features of Objects	1.1.a	• lines, open figures and closed figures
					1.1.b	• drawing figures using lines
					1.1.c	• basic flat and solid figures
					1.1.d	• flat figures as outlines of the surfaces of solid figures
3	1	Shapes	1.1	Vertices and Diagonals of Two-dimensional Shapes	1.1.a	• identifying 2D shapes with straight and curved lines
					1.1.b	• identifying sides, corners and diagonals
					1.1.c	• making a tangram
					1.1.d	• recognising 3D shapes and their faces and edges
4	1	Shapes	1.1	Circle and its Parts	1.1.a	• circle and its parts
					1.1.b	• drawing a circle
5	1	Shapes	1.1	Identify and Classify Angles	1.1.a	• angles and naming the angles
					1.1.b	• using a protractor
					1.1.c	• properties of a protractor
					1.1.d	• types of angles
			1.2	Nets and Views of Solids	1.2.a	• nets of cubes, cuboids, cylinders and cones
					1.2.b	• top, front and side views of objects

B – Vision-to-Action Plan: 1.2 Nets and Views of Solids

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
1 DD/MM/YYYY	8-10 – THK, RCL	1.2.a	<ul style="list-style-type: none"> Recall 2D and 3D shapes. Define the net of a solid. 	<ul style="list-style-type: none"> Questioning Using Concrete Material 	<ul style="list-style-type: none"> box nets of cubes, cuboids, cylinders and cones 	WB: Pg. 8 (Q. 1-3)	WB: Pg. 8 (Q. 4, 5, 7, 8)	
2 DD/MM/YYYY	10, 11 – REM/UND	1.2.a	<ul style="list-style-type: none"> Form given shapes/objects using the correct nets. 	<ul style="list-style-type: none"> Using Concrete Material Activity Method 	<ul style="list-style-type: none"> Chart of Solid Figures Chart of Area, Perimeter, Volume and Nets scissors and ruler 	WB: Pg. 9 (Q. 9-11)	WB: Pg. 10 (Q. 15, 16)	
3 DD/MM/YYYY	12 – APP	1.2.b	<ul style="list-style-type: none"> Draw the top, side and front views of the given solid objects. 	<ul style="list-style-type: none"> Using Concrete Material 	<ul style="list-style-type: none"> Cut-outs the shapes Glass Notebook 	WB: Pg. 9 (Q. 12-14) WB: Pg. 9 (Q. 6)	WB: Pg. 11 (Q. 17-20)	
4 DD/MM/YYYY	13-15 – APP, HOTS, Drill Time	1.2.b	<ul style="list-style-type: none"> Identify top view, side view and front view of different solids. 	<ul style="list-style-type: none"> Practising 	–	TB: Pgs. 12-15 (Example 8-11) TB: Pg. 15 (Drill Time Q. 1, 2) WB: Pgs. 14, 15 (Q. 21, 22)	–	

Solution:

In 12 hours, the hour hand goes around the clock and so completes 360° .

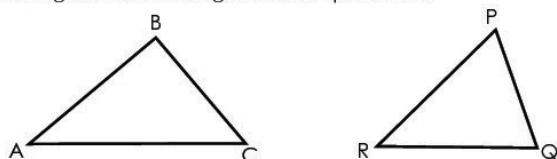
In one hour, the angle covered by the hour hand = $\frac{360^\circ}{12} = 30^\circ$

So, in two hours, the angle covered by the hour hand is $30^\circ \times 2 = 60^\circ$.

Therefore, the angle covered by the hour hand from 2 p.m. to 4 p.m. is 60° .

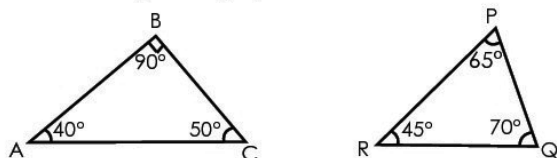
Example 7:

In $\triangle ABC$ and $\triangle PQR$ given, find the measures of all the angles. Find the sum of the angles in each triangle and compare them.



Solution:

Measure the angles using a protractor and mark them as shown in the figures.



In triangle ABC, $\angle A = 40^\circ$, $\angle B = 90^\circ$, $\angle C = 50^\circ$.

Sum of the angles = $40^\circ + 90^\circ + 50^\circ = 180^\circ$

In triangle PQR, $\angle P = 65^\circ$, $\angle Q = 70^\circ$, $\angle R = 45^\circ$.

Sum of the angles = $65^\circ + 70^\circ + 45^\circ = 180^\circ$

Comparing the sum of angles in the two triangles, we see that they are equal.

Concept 1.2: Nets and Views of Solids



Think

Pooja saw a figure in a pamphlet. It looked like the one shown here. She was curious to know how a house was drawn on a sheet of paper. Do you also want to know?



Transactional Tip(s)

Duration: 29 min



Questioning:

- Use TB: Pg. 8, 'Think' to question the class about showing 3D objects on 2-dimensional paper.
- Show a box in class. Then show two different pictures of the same box shape, but from different perspectives. Ask why the same object can be drawn in two different ways.

Class Pulse Check

Duration: 1 min

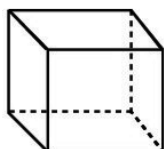


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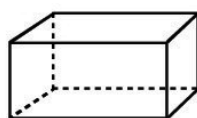


Recall

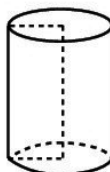
Let us recall some 3D shapes or solids. Cube, cuboid, cylinder and cone are a few 3D objects. Let us observe the faces of these 3D objects.



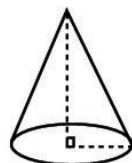
cube



cuboid



cylinder



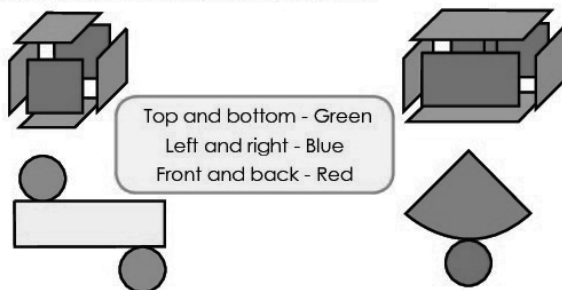
cone

We observe that their faces are made up of 2D figures or shapes. So, we can represent a 3D solid as a 2D figure.



Remembering and Understanding

Let us see the solids with their faces separated as shown.



We observe that each 3D shape can be opened up into a 2D shape. The 2D framework of a 3D solid is called its **net**. It is a flat shape which when folded results in the solid.

Let us now understand to identify the nets of solids such as cube, cuboid, cylinder and cone.

Net of a cube: We know that all the faces of a cube are squares. So, the net of a cube has six squares. It is drawn in such a way that on folding it, we get a cube. Depending on how a cube is unfolded; there can be many nets of a cube.

Important Words

Duration: 1 min

- **Today:** nets, net of cube, 3D objects, cylinder, cone, cube, cuboid

Transactional Tip(s)

Duration: 23 min



Using Concrete Material:

- Ask learners to recall the 3D shapes shown in TB: Pg. 9, 'Recall'.
- Before the class commences, prepare nets of cubes, cuboids, cylinders and cones, as detailed in TB: Pg. 10.
- Colour the faces of the cuboid net in matching pairs, as shown in TB: Pg. 9.
- In class, explain the meaning of net. Explain that nets can be made for many different 3D shapes. Show the nets for cubes, cuboids, cylinders and cones.
- Show the net for a cube, cuboid, cylinder and cone and fold it into 3D shapes. Show how the sides facing each other match.
- Solve and discuss WB: Pg. 8, Q. 1-3.

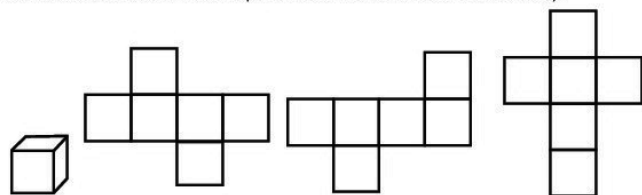
Class Pulse Check

Duration: 1 min



- 1) What are the top and front views of a duster and a notebook?

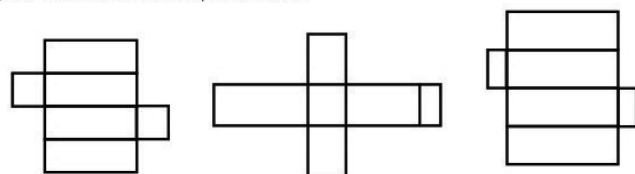
These are some nets of a cube. The flaps on the net hold the faces firmly.



Try this!

Collect some cubical boxes and unfold each of them carefully in different ways. Draw the nets so obtained.

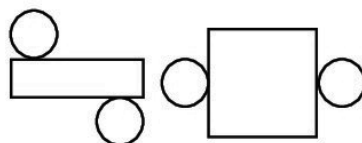
Net of a cuboid: We know that all the faces of a cuboid are rectangles. Some cuboids have four rectangular faces and two square faces.



Try this!

Collect some cuboidal boxes and unfold each of them carefully in different ways. Draw the nets so obtained.

Net of a cylinder: A cylinder has two circular ends and a curved surface. So, its net has a rectangle (or square) and two circles.



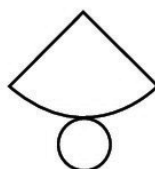
Try This!

Collect cylindrical cans and cut them carefully to obtain their nets.

Net of a cone: A cone has a circular base and a curved surface. The net of a cone is as shown.

Try this!

Get a conical birthday hat. Cover the open part with a circular sheet. Then cut the hat with scissors carefully to get the net of the cone.



Important Words

Duration: 1 min

- **Last class:** nets, net of cube, 3D objects, cylinder, cone, cube, cuboid
- **Today:** net of cuboid, net of cylinder, net of cone

Transactional Tip(s)

Duration: 18 min



Using Concrete Material:

- Show learners the Classklap Chart of Solid Figures and Classklap Chart of Area, Perimeter, Volume and Nets and ask them to identify their 3D solid shapes.
- Show the net and demonstrate how it forms a 3D shape. For example, a cylinder is formed of a rectangle and 2 circles.
- Divide the class into 4 groups and assign one 3D shape to each group (cube, cuboid, cylinder, cone).
- Provide the required coloured paper, scissors and ruler to make the nets to each group. Assist learners to cut the nets for the assigned shape, as shown in the TB.
- Show the nets made by each group and how each 3D shape is made.
- Solve and discuss WB: Pg. 9, Q. 10, 11.

Class Pulse Check

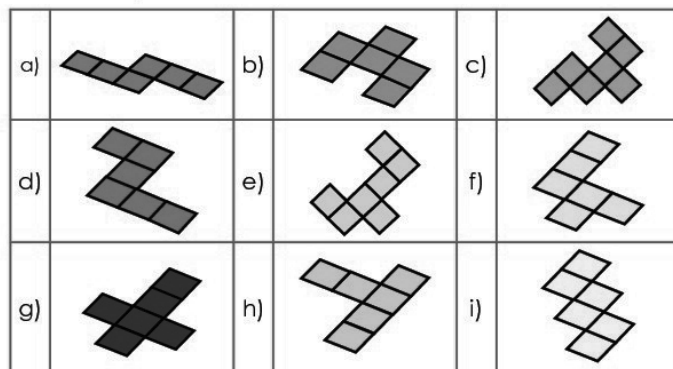
Duration: 2 min



- 1) What the shape of the top view of a bottle cap?
- 2) What the side/front view of the bottle cap?

Activity:

Trace and cut these shapes. Which of these can be folded to form cubes?



Perspective

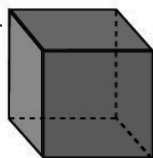
We see that the railway tracks appear to be wider at our end, but appear to be narrower at the other end. Similarly, roads and bridges too appear to be broader at our end and narrower at the other end.



Such a view is known as the **perspective view**. It is widely used in art and architecture.

Objects look differently when viewed from different sides.

Observe this cube.



Top view:



Side view:



Front view:



From all the sides, the cube looks like a square.

Important Words

–

Transactional Tip(s)

Duration: 9 min



Activity Method:

- Let learners draw and cut out the shapes given in TB: Pg. 11, Activity. Ask them to fold each cut-out to make a cube and see which shape makes a perfect cube.
- Help them to complete the activity in the classroom.

Class Pulse Check



1) -

Annual Day:
8/61

Day:
3/4

Actual Date:

Page(s)
12

Now, observe this cuboid.



Top view:





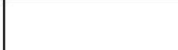
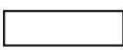








Side view:



Front view:



Let us observe some objects from different views.


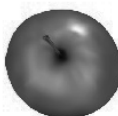

Object	Front view	Top view	Side view
			
			
			



Application

Let us now see a few real-life examples based on the different views of solid objects.

Example 8: Write the top view and the side view of the objects whose front views are given.
One has been done for you.

S.No.	Front view	Top or side view	
a)			
		Top view	Side view

Important Words

Duration: 1 min

- **Last class:** net of cuboid, net of cylinder, net of cone
- **Today:** perspective view

Transactional Tip(s)

Duration: 27 min



Using Concrete Material:

- Explain the concept of 'perspective view' by discussion.
- Take a glass and ask learners to identify the shapes when observed from the side and from the top.
- Note down their observations and help them reach the correct answer if they are incorrect.
- Again, show them a water bottle and tell them to draw the side view and the top.
- Learners will assess each other's answers.
- Solve and discuss :
 - WB: Pg. 9, Q. 12-14,
 - WB: Pg. 9, Q. 6.

Class Pulse Check

Duration: 2 min



- 1) Is there any difference between the top view and the bottom view of a cylindrical shape?
- 2) What is the top view of a sphere?

Annual Day:
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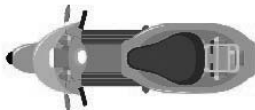



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Page(s)
13,14,15





Important Words

Duration: 1 min

- Last class: perspective view
- Today: –

S.No.	Front view	Top or side view	
b)			
c)			

Example 9: Draw the objects which have the given views.

S. No.	Top	Side	Front
a)			
b)			

Solution: Many objects have the given views.

The following are a few examples.



Transactional Tip(s)

Duration: 29 min



Practising:

- Ask learners to solve TB: Pgs. 12-15, Examples 8-11 and discuss the solutions in class.
- Solve and discuss TB: Pg. 15, 'Drill Time', Q. 1, 2.

Class Pulse Check

1) -



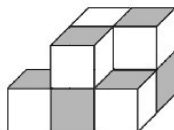


Higher Order Thinking Skills (H.O.T.S.)

Let us now study a few solids made of unit cubes and identify their top, front and side views.

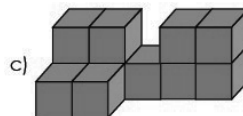
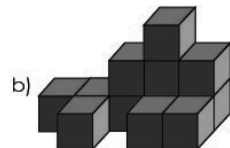
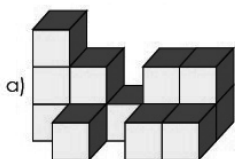
Example 10: Draw the top, front and side views of the given solid.

Solution: The top, front and side views of the given solid are as follows:



Top view	Front view	Side view

Example 11: Draw the top, front and side views of the given solids.



Solution:

	Object	Top view	Front view	Side view
a)				
b)				

Important Words

–

Transactional Tip(s)

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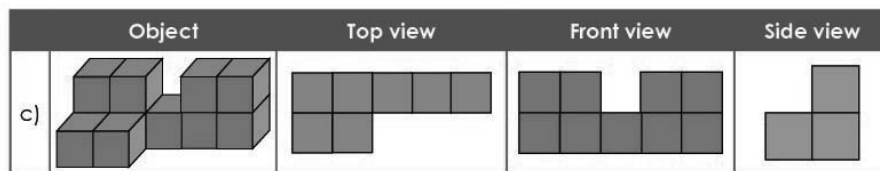
Class Pulse Check

1) –



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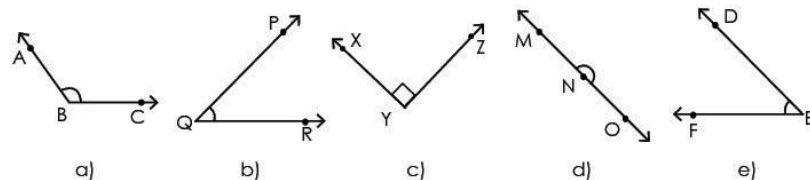
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Drill Time

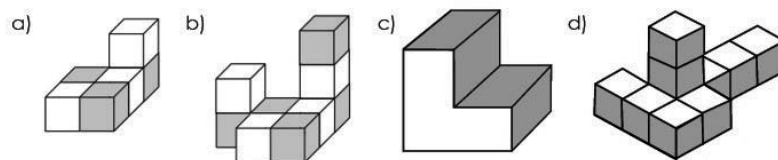
Concept 1.1: Identify and Classify Angles

- 1) Measure these angles using a protractor. Then mention what type of angle each of these figures represent.



Concept 1.2: Nets and Views of Solids

- 2) Draw the top, side and front views of these solids.



Class Pulse Check

- 1) -





C – Exit Assessment

	Suggested questions to test the learning objective(s)	Learning objective(s)	Number of learners who answered correctly
1	Give real-life examples for: 1) cube 2) cylinder (Ans. Learners responses, e.g.: die, pipe)	Period 1 - nets of cubes, cuboids, cylinders and cones	
2	Name the 3D shape of: 1) textbook 2) birthday cap (Ans. Cuboid, cone)	Period 2 - nets of cubes, cuboids, cylinders and cones	
3	How many rectangular shapes will you get when a cuboidal box is unfolded? (Ans. 6)	Period 3 - nets of cubes, cuboids, cylinders and cones	
4	What is the shape of a football? (Ans. Sphere)	Period 3 - nets of cubes, cuboids, cylinders and cones	

Post-lesson Reflection						
TB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	WB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
<hr/>						
Enthusiastic participation		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Concept clarity in the classroom		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Concept clarity through the workbook		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

	Handhold Learners	Challenge Learners
Names		
Exam Revision Strategy	Reteach <input type="checkbox"/>	Revise <input type="checkbox"/> Practise <input type="checkbox"/>
App Report	Number _____	Signature _____

Teacher Reference: Textbook

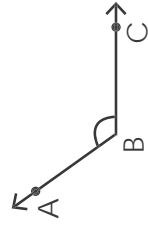
Note to teacher: The Workbook Teacher Reference shows step-by-step solutions with extra detail, to help teachers guide students. While supporting learners to solve sums, teachers should not look for language that exactly matches the 'Teacher Reference'. Instead, teachers should check if the learners have followed the correct steps to find the solution.

Chapter 1: Shapes

Concept 1.1: Identify and Classify Angles

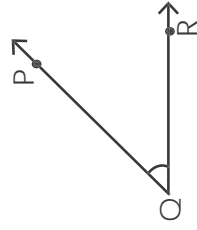
Drill Time

- 1) Measure these angles using a protractor. Then mention what type of angle each of these figures represent.



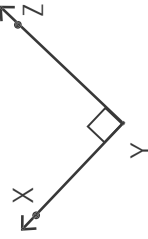
a)

Solution: a) 125° ; Obtuse angle



b)

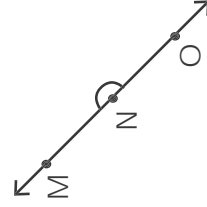
d) 180° ; straight angle



c)

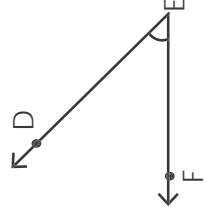
b) 45° ; Acute angle

e) 45° ; Acute angle



d)

c) 90° ; Right angle



e)

Teacher Reference: Textbook

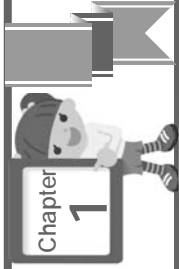
Chapter 1: Shapes

Concept 1.2: Nets and Views of Solids

Drill Time

- 2) Draw the top, side and front views of these solids.

	Front view	Side view	Top view
a)			
b)			
c)			
d)			



Shapes

Concept 1.1: Identify and Classify Angles



Recall

Multiple Choice Questions

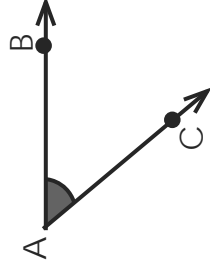
- 1) How many end points does a line segment have? [C]
(A) 4 (B) 3 (C) 2 (D) 1
- 2) \overrightarrow{AB} is read as _____. [A]
(A) ray AB (B) line AB (C) point AB (D) segment AB
- 3) \overleftrightarrow{XY} is read as _____. [A]
(A) line XY (B) ray XY (C) points XY (D) segment XY



Remembering and Understanding

Multiple Choice Questions

- 4) Which of the following is an acute angle? [B]
(A) 100 degrees (B) 60 degrees (C) 90 degrees (D) 180 degrees
- 5) The angle between the directions North and East is a/an _____. [A]
(A) right angle (B) obtuse angle (C) acute angle (D) zero angle
- 6) The name of this angle is _____. [C]



- (A) $\angle ACB$ (B) $\angle CBA$ (C) $\angle BAC$ (D) $\angle B$

Fill in the Blanks

- 7) The figure formed by two rays with the same initial point is called a/an _____ **angle** _____.
- 8) The unit used to represent the measure of an angle is _____ **degree** _____.
- 9) Angles are measured using a _____ **protractor** _____.

Very Short Answer Questions

- 10) What is the measure of a complete angle?

Solution: **360°**

- 11) Arrange the following angles from smallest to largest.

Reflex	Acute	Obtuse	Zero	Straight	Right
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Solution: Zero angle, Acute angle, Right angle, Obtuse angle, Straight angle and Reflex angle.

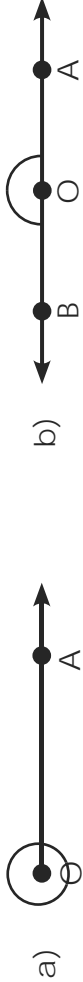
- 12) The measures of some angles are given. Which of them are acute angles?

0°, 20°, 45°, 90°, 120°, 150°, 180°, 210°, 270°

Solution: **20° and 45°**
.....

Short Answer Questions

- 13) What is the measure of the angle at point O in each of the figures given?



What are these angles called?

Solution: a) The measure of the angle at point O is 0°. There is no movement of the initial ray OA through any distance. So, the angle formed is 0°. It is called zero angle.
b) The measure of the angle is 180° at point O. The final ray lies opposite to the initial ray and so, the angle formed between the initial ray and the final ray is 180°. It is called straight angle.

- 14) Classify the following angles.

95°	133°	0°	82°	29°	90°
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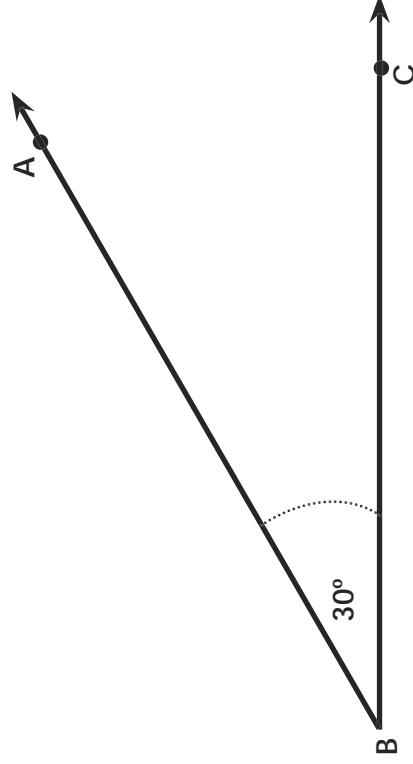
Solution: 95° = Obtuse angle
 135° = Obtuse angle
 0° = Zero angle
 82° = Acute angle
 29° = Acute angle
 90° = Right angle

Long Answer Questions

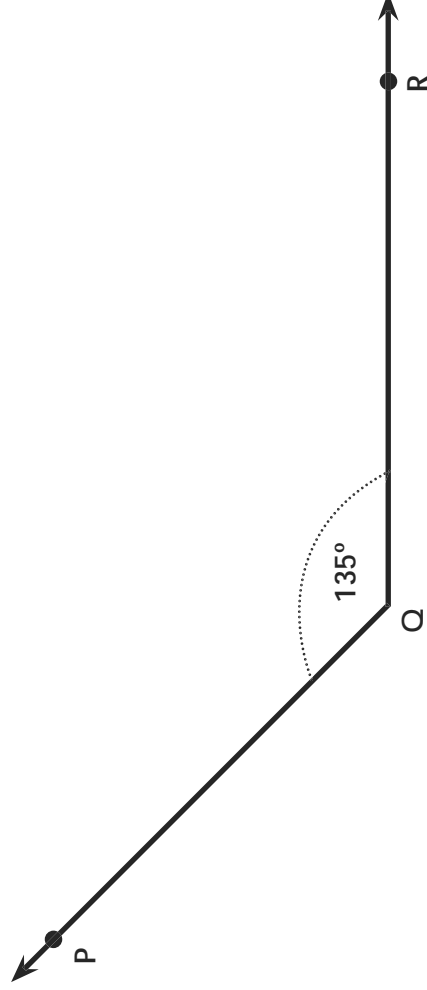
- 15) Draw the following angles.

a) 30° b) 135°

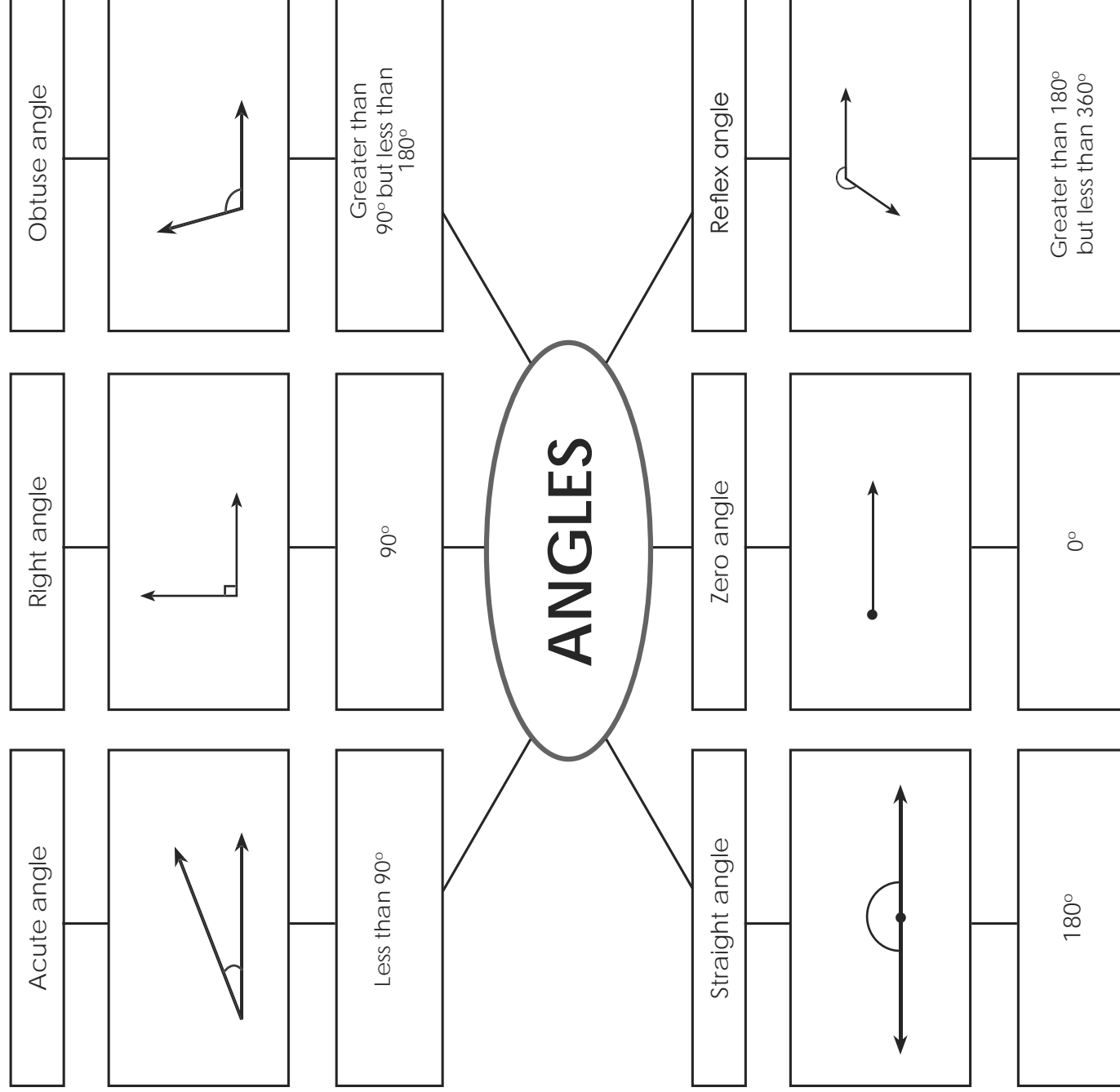
Solution: a)



b)



16) Fill in the following mind map. (Two have been done).

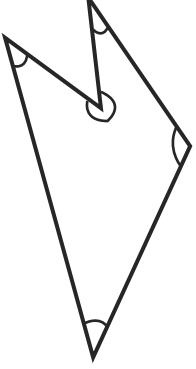




Application

Short Answer Questions

- 17) Count the number of acute, obtuse and reflex angles formed inside the given figure.



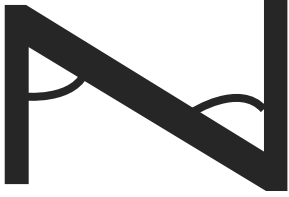
Solution: Acute angle = 3

Obtuse angle = 1

Reflex angle = 1

.....

- 18) Identify and explain the different types of angles marked in the letter Z of the English alphabet.



Solution: Both the angles marked in the letter Z are acute angles. They are acute angles

because their measures are less than 90°

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Long Answer Questions

19) Write the types of angles made by the hands of the clocks. (Consider only non-reflex angles.)



Solution: a) Obtuse angle
b) Right angle
c) Obtuse angle
d) Acute angle
.....
.....
.....

20) By what angle does the hour hand move when it goes from 3 p.m. to 8 p.m.?

Solution: The hour hand moves 360° in 12 hours.

In one hour it will move $= 360^\circ \div 12 = 30^\circ$

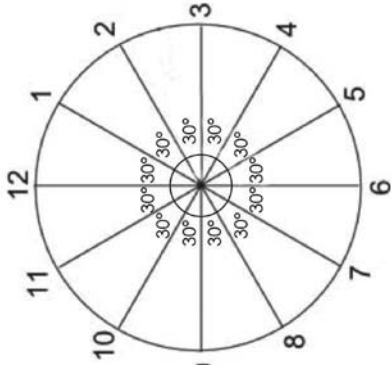
The number of hours between

3 p.m. and 8 p.m. is $8 \text{ p.m.} - 3 \text{ p.m.} = 5$

Therefore, the angle through which the hour hand

moves is $30^\circ \times 5 = 150^\circ$

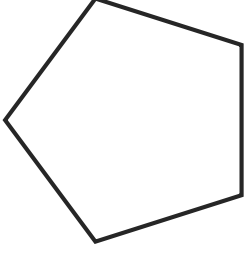
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Short Answer Question

- 21) Measure the angles of the given figure. What is the sum of all its angles?

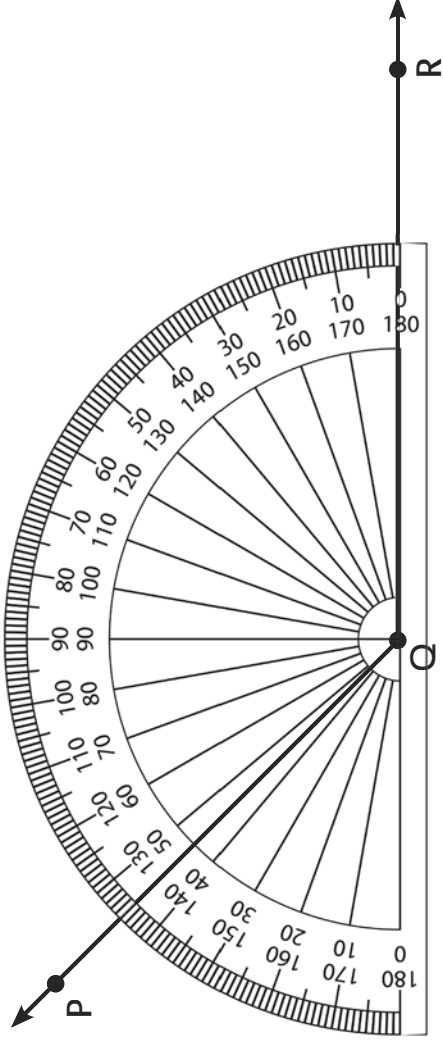


Solution: Measuring each angle with a protractor, we see that each angle measures 108° .

The sum of angles is 5 times $108^\circ = 540^\circ$.

Long Answer Question

- 22) Measure and write the angle given using a protractor. Write the steps you followed.



Solution: Steps:

- 1) Place the protractor on the given angle such that the base line coincides with one arm of the angle and the centre coincides with the vertex.
- 2) Note the marking on which the other arm lies.
- 3) Write the measure as angle PQR = the measure in step 2.

As the measure of the angle is 135° , it is an obtuse angle.

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



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Concept 1.2: Nets and Views of Solids



Recall

Multiple Choice Questions

- 1) The 2D face of  is _____. [C]
 (A)  (B)  (C)  (D) 
- 2) A cube looks like a _____ when represented on paper. [B]
 (A) cuboid (B) square (C) rectangle (D) cone
- 3) A figure with only two pairs of equal opposite sides is a _____. [B]
 (A) line (B) rectangle (C) triangle (D) circle



Remembering and Understanding

Multiple Choice Questions

- 4) The net of a cube has _____ square faces. [C]
 (A) 12 (B) 5 (C) 6 (D) 4
- 5) The solid shape which has six rectangular faces is a _____. [D]
 (A) cone (B) cylinder (C) cube (D) cuboid

- 6) The respective numbers on the top, front and side views of the given die are _____.
[B]



- (A) 6, 4, 2 (B) 2, 4, 6 (C) 6, 2, 4 (D) 4, 6, 2

Fill in the Blanks

- 7) The 2D framework of a 3D solid is called its _____ **net** _____.
- 8) All the faces of a cube are _____ **squares** _____.
- 9) Perspective view is used in art and _____ **architecture** _____.

Very Short Answer Questions

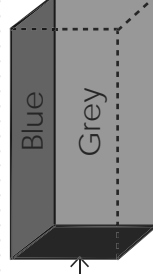
- 10) How many circular ends does the net of a cylinder have?

Solution: Two circular ends

- 11) How many circular ends does the net of a cuboid have?

Solution: No circular ends

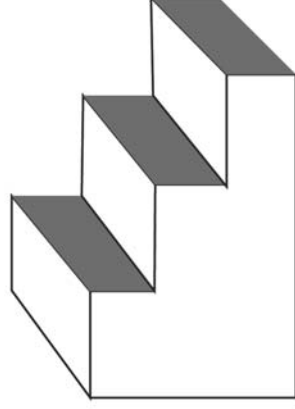
- 12) What is the colour of the top view of the given cuboid?



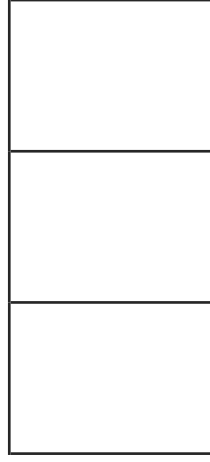
Solution: Blue

Short Answer Questions

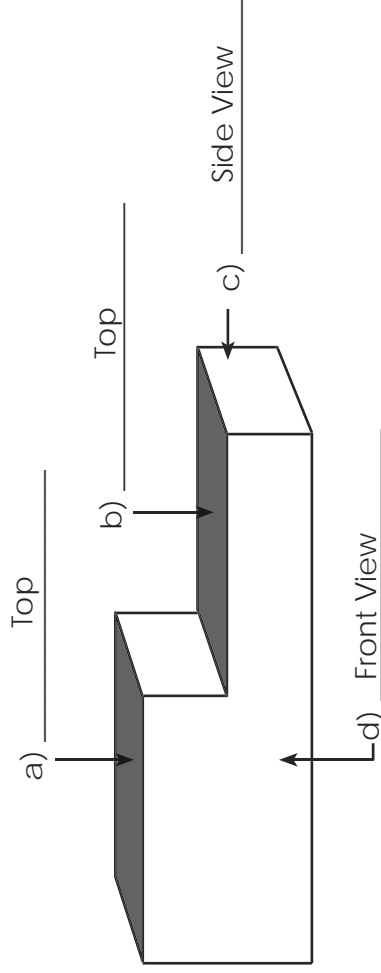
- 13) Draw the top view of the given figure.



Solution:



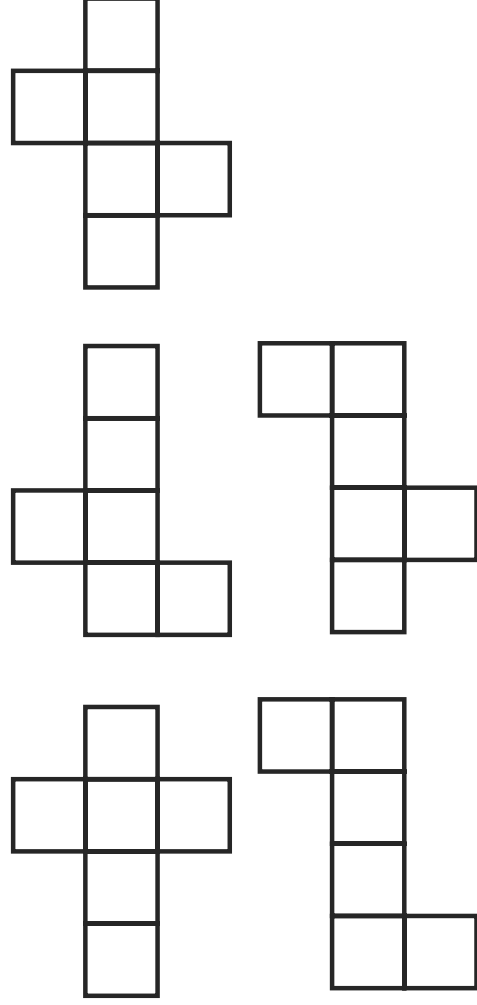
- 14) Label the views of this solid in the blanks given.



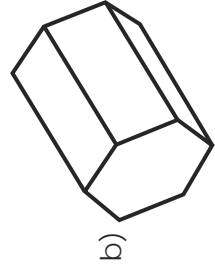
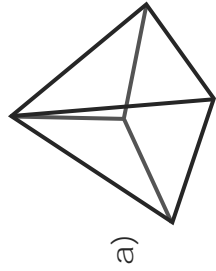
Long Answer Questions

- 15) Draw any five nets of a cube.

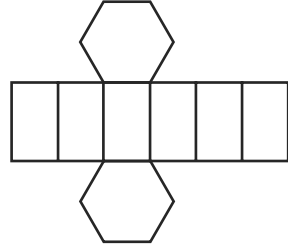
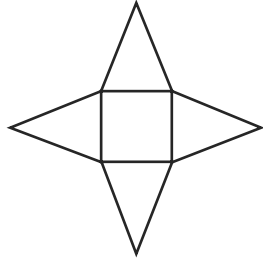
Solution: Learner's response



16) Draw the nets of the following 3D figures.



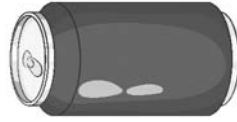
Solution:



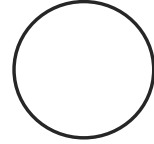
Application

Short Answer Questions

17) Draw the top and front views of:



Solution:



Top view

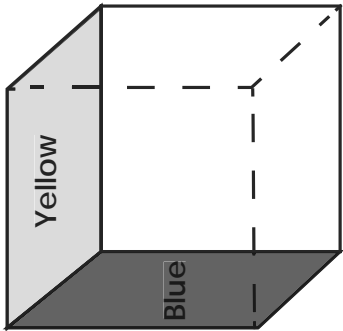


Front view

18) Colour the given cube as follows:

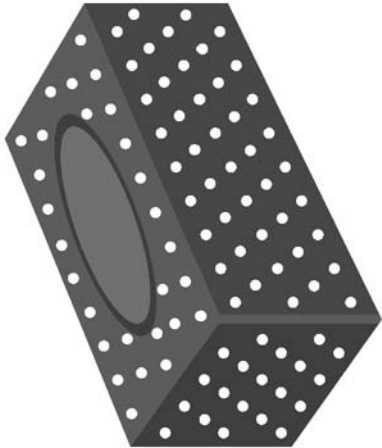
Side face: Blue

Top face: Yellow



Long Answer Questions







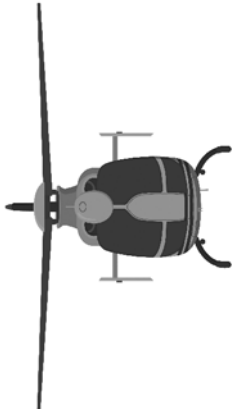
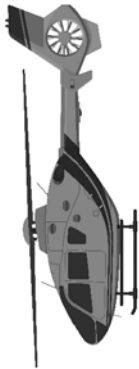

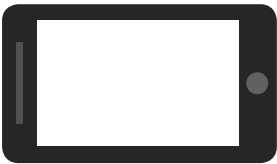


19) Draw the top, front and side views of the solid given. Then draw the net.



Solution:

Top view	Front view	Side view
	or	or

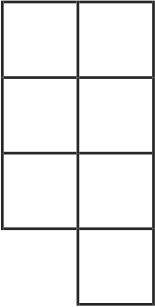
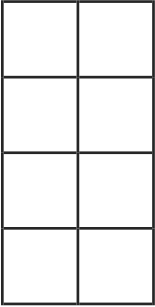
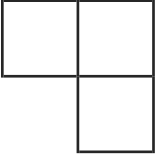
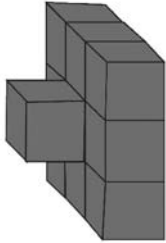
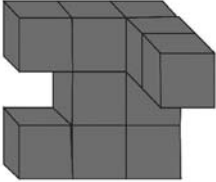
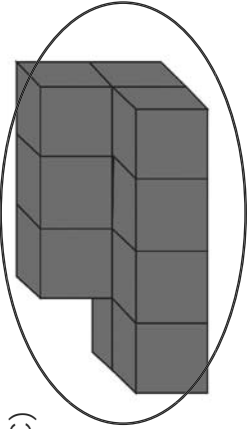
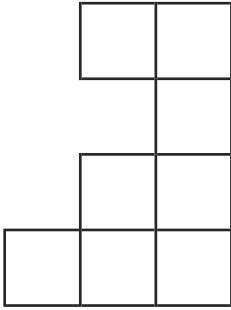
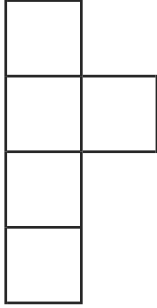
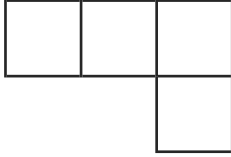
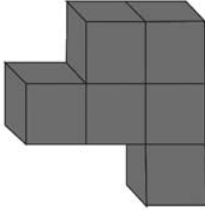
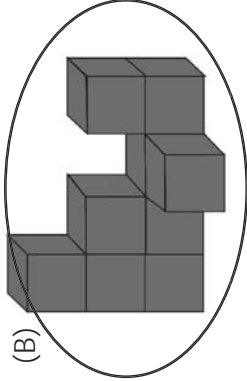
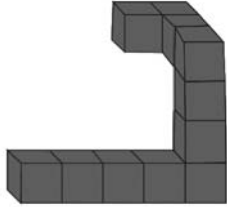
20) Tick the top view and cross the side view of the given objects whose front view is given.

Front view		Top or side view	
			<input checked="" type="checkbox"/>
			<input checked="" type="checkbox"/>
			<input checked="" type="checkbox"/>
			<input checked="" type="checkbox"/>



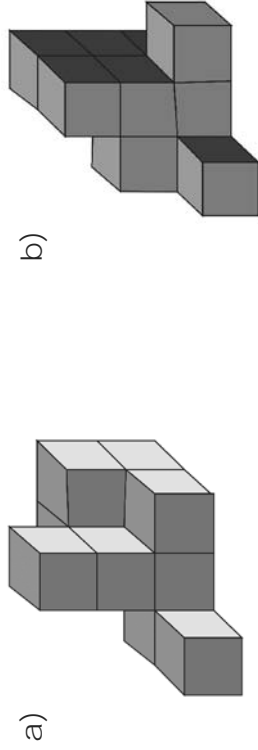
Short Answer Question

- 21) Circle the correct solid based on its given views.

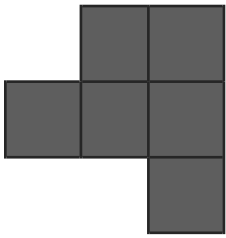
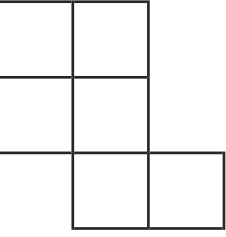
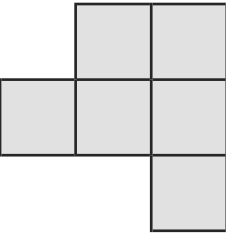
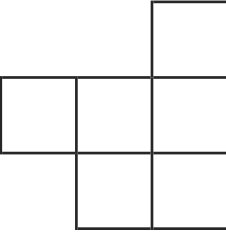
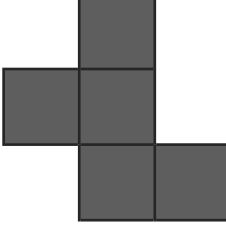

	Front view	Top view	Side view
a)			
	(A) 	(B) 	(C) 
b)			
	(A) 	(B) 	(C) 

Long Answer Question

- 22) Draw the front, top and side views of the given solids. Two are done for you.



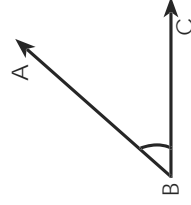
Solution:

	Front view	Top view	Side view
a)			
b)			



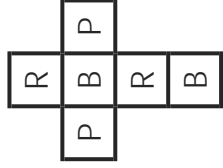
Practice Questions

- 1) Name the angle shown here.

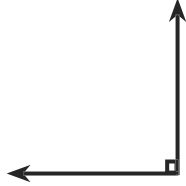
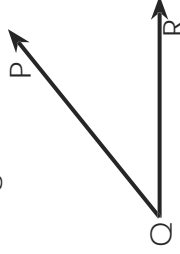


- 2) The top, front and side views are shown in the given die. Write the appropriate numbers in a net of the die. (Hint: The sum of the opposite faces of the die is 7.)
- 3) Which 3D shape (cone, cuboid or cylinder) has a rectangle as its top view?
- 4) What is the shape of the top view of a 40-inch TV?
- 5) What is the side view of an orange?

- 6) Look at the following net of a cube. Draw its cube and colour the faces according to the given map. (P = pink, B = blue and R = red)



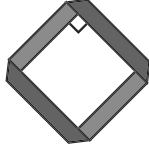
- 7) What is the measure of the given angle?
- 8) If the front view of a cube is a square, what is the shape of its side view?
- 9) What is the type of the given angle?



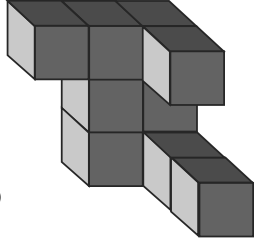
- 10) Draw the top view of the given object.



- 11) If the front view of a box is a rectangle, what will be its top view?
- 12) What is the type of angle made by the curves of the letter 'D'?
- 13) Identify the angle marked in the shape.



- 14) Is a cone a flat shape?
- 15) How many cubes are there in this figure?

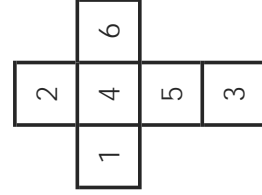


Chapter 1: Shapes



Practice Questions

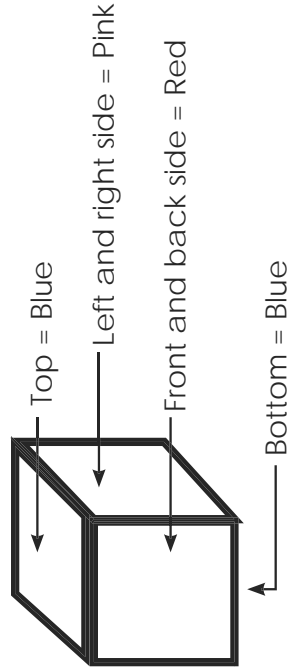
1) $\angle ABC$ or $\angle CBA$



3) cuboid

4) rectangle

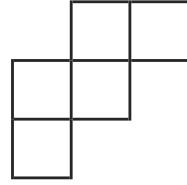
5) circle



7) 40°

8) square

9) right angle



11) rectangle

12) acute angle

13) right angle

14) no

15) 10 cubes

A – Curriculum to Learning Objectives: Patterns

Prior Knowledge		• Shapes				
Class	Ch. No.	Chapter Name	C. No.	Concept Name	L. Obj. No.	Learning Objectives
1	2	Patterns	2.1	Patterns in Our Surroundings	2.1.a	• patterns in shapes
					2.1.b	• patterns in numbers
2	2	Patterns	2.1	Patterns Using Shapes	2.1.a	• identifying basic shape(s) in a pattern
					2.1.b	• creating patterns using objects, shapes and numbers
3	2	Patterns	2.1	Patterns in Shapes and Numbers	2.1.a	• identifying and creating patterns in shapes and numbers
					2.1.b	• tiling of the given shape
4	2	Patterns	2.1	Patterns based on Symmetry	2.1.a	• patterns in lines and shapes
					2.1.b	• number patterns
					2.1.c	• line and axis of symmetry
					2.1.d	• growing and reducing patterns
5	2	Patterns	2.1	Patterns in Rotation	2.1.a	• rotation of shapes
					2.1.b	• arranging figures and shapes to form patterns
			2.2	Patterns in Numbers	2.2.a	• patterns in numbers

B – Vision-to-Action Plan: 2.1 Patterns in Rotation

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
1 DD/MM/YYYY	16, 17 – THK, RCL	2.1.a	<ul style="list-style-type: none"> Recall axis of symmetry and line of symmetry. 	<ul style="list-style-type: none"> Activity Method Using Concrete Material 	<ul style="list-style-type: none"> Cut-outs from magazines of some symmetric and asymmetric pictures and alphabets playing cards 	–	WB: Pg. 17 (Q. 1-3) WB: Pg. 18 (Q. 7)	
2 DD/MM/YYYY	17, 18 – REM/UND	2.1.a	<ul style="list-style-type: none"> Observe different rotations of an object. 	<ul style="list-style-type: none"> Activity Method 	<ul style="list-style-type: none"> cut-out of a battery 	WB: Pg. 18 (Q. 8, 9)	–	
3 DD/MM/YYYY	18-20 – REM/UND	2.1.b	<ul style="list-style-type: none"> Identify designs of rotational patterns. 	<ul style="list-style-type: none"> Practising 	—	TB: Pg. 18 (Examples 1-4) WB: Pgs. 18, 19 (Q. 10-12)	WB: Pgs. 17, 18 (Q. 4-6) WB: Pgs. 19, 20, 21 (Q. 13-16)	

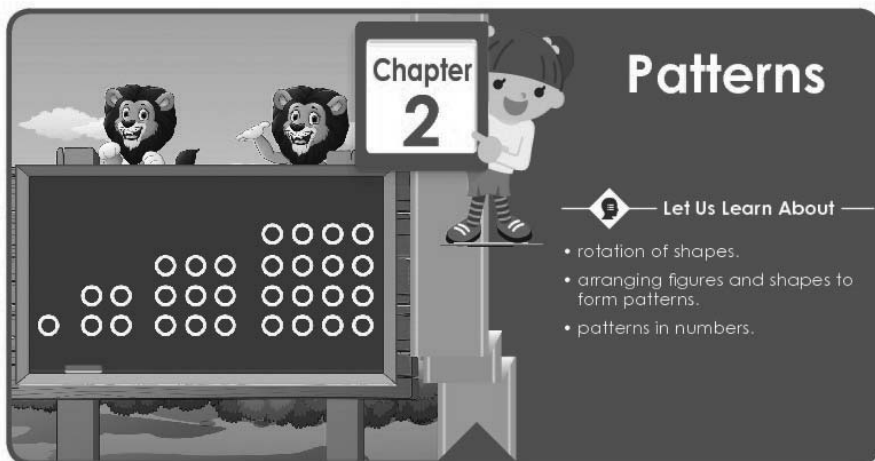
Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
4 DD/MM/YYYY	20-23, 30, 31 – APP, HOTS, Drill Time	2.1.b	<ul style="list-style-type: none"> Observe and practice the pattern of various objects and designs. Identify defects in the pattern and design. 	<ul style="list-style-type: none"> Guided Learning Interactive Discussion 		TB: Pg. 20 (Examples 5, 6) TB: Pgs. 21-23 (Example 7, 8) TB: Pgs. 30, 31 (Drill Time Q. 1-3) WB: Pgs. 23, 24 (Q. 21, 22)	WB: Pgs. 21, 22 (Q. 17, 18) WB: Pgs. 22, 23 (Q. 19, 20)	

Annual Day:
10/61

Day:
1/4

Actual Date:

Page(s)
16



Concept 2.1: Patterns in Rotation



Think

Pooja had some playing cards. She picked up the aces of the cards and arranged them as shown. Pooja's friend Vidur turned them to the right as shown.

Pooja and Vidur were happy to note the change in the shapes on the cards. What would happen if the cards are again turned right?



Recall

In class 4, we have learnt about reflection and symmetry. Objects or shapes are said to be symmetrical if they can be divided into two identical parts about a given line. Let us recall them.

The line that divides a shape into symmetrical halves, is called the **axis of symmetry** or **line of symmetry**.

Important Words

Duration: 1 min

- **Today:** axis of symmetry, line of symmetry, symmetrical

Transactional Tip(s)

Duration: 27 min



Using Concrete Material:

- Bring cut-outs from magazines of some symmetric and asymmetric pictures and letters.
- Show learners, the axis of symmetry or line of symmetry by folding the pictures at the centre. Show how to check if a picture has multiple lines of symmetry by folding the image vertically, horizontally and diagonally.
- Using this technique, show learners, symmetric and asymmetric pictures.

Activity Method:

- On the noticeboard, pin up four playing cards in a line. Place the pin at the centre of each card as shown in TB: Pg. 16, 'Think'.
- Turn the cards 90 degrees to the right.
- Discuss what learners noticed when the cards were turned.

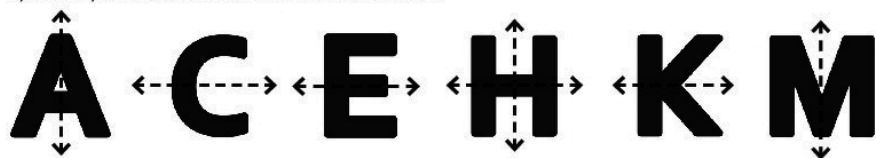
Class Pulse Check

Duration: 2 min



- 1) How many lines of symmetry does the letter X have?
- 2) Can a line of symmetry be drawn on your palm?

Symmetry can be vertical or horizontal or both.



Shapes or objects that are not symmetrical are said to be asymmetrical.

The following letters are asymmetrical.



We cannot draw a line of symmetry for such asymmetrical figures. The shape alone does not decide its symmetry. The details in it also must be divided exactly.



Remembering and Understanding

Each half of a symmetrical figure is a reflection of the other, about the line of symmetry. Patterns can be formed by turning a given shape clockwise or anticlockwise by a complete turn, half turn, quarter turn, and so on.

For example, a complete turn of  as  or  is .

Turning a shape, letter or figure in the clockwise or anticlockwise directions is called the **rotation** of shapes.

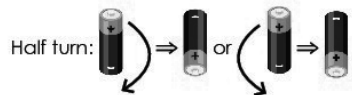
Quarter turn = 90° rotation

One-third turn = 120° rotation

Half turn = 180° rotation

One turn = 360° rotation

Here are a few examples of turns and their symbols.



Important Words

Duration: 1 min

- **Last class:** axis of symmetry, line of symmetry, symmetrical
- **Today:** rotation, half turn, complete turn, quarter turn

Transactional Tip(s)

Duration: 27 min



Activity Method:

- Bring a cut-out of a battery and pin it to the noticeboard using a pin at the centre.
- Discuss and demonstrate TB: Pg. 17, 'Remembering and Understanding'.
- Explain the full, half, quarter and one-third rotation in the right and left directions as given in TB: Pg. 17, 18 by turning/rotating the image on the noticeboard at the centre.
- Solve and discuss WB: Pg. 18, Q. 8, 9.

Class Pulse Check

Duration: 2 min



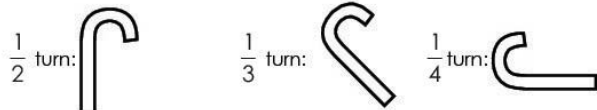
- 1) How many degrees is a quarter rotation?
- 2) How many degrees is a one-third rotation?



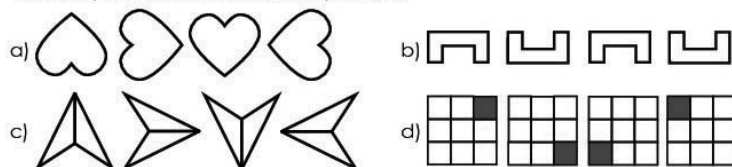
Let us consider a few examples.

Example 1: Show how the given letter looks when it is turned clockwise through a $\frac{1}{2}$ turn, $\frac{1}{3}$ turn and $\frac{1}{4}$ turn.

Solution: The way the given letter looks when rotated clockwise through the required turns is as follows:



Example 2: Identify the turn that the shape takes in each of these patterns. Draw the next two shapes in each of the given patterns.



Solution: a) In this pattern, undergoes a quarter turn clockwise. So, the next two

shapes of the pattern are and

b) In this pattern, undergoes a half turn clockwise. So, the next two shapes of the pattern are and

c) In this pattern, undergoes a quarter turn clockwise. So, the next two shapes of the pattern are and

Important Words

Duration: 1 min

- **Last class:** rotation, half turn, complete turn, quarter turn
- **Today:** –

Transactional Tip(s)

Duration: 27 min



Practising:

- Read out and solve TB: Pg. 18, Example 1, 2 in the blackboard.
- Solve and discuss :
 - TB: Pg. 18-20, Examples 3, 4,
 - WB: Pgs. 18, 19, Q. 10-12.

Class Pulse Check

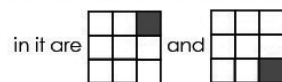
Duration: 2 min



- 1) What will happen if you rotate the letter H 180 degrees to the right?
- 2) State a shape that looks the same after one-quarter, one-half and one turn.



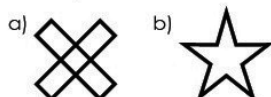
d) In this pattern, the shape undergoes a quarter turn. The green square moves clockwise leaving an alternate box in the 3×3 grid. So, the next two shapes



Example 3: Which of these shapes look the same after a $\frac{1}{4}$ turn?



Solution: The shapes that look the same after a $\frac{1}{4}$ turn are:



Example 4: Complete the table by drawing how the following shapes will look like after $\frac{1}{4}$, $\frac{1}{2}$ and 1 turns.

Shape				
-------	--	--	--	--

Solution:

Shape	$\frac{1}{4}$ turn	$\frac{1}{2}$ turn	1 turn

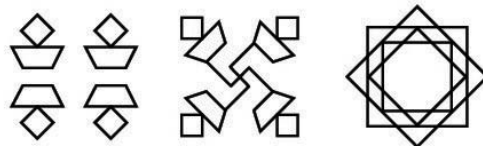
Shape	$\frac{1}{4}$ turn	$\frac{1}{2}$ turn	1 turn

From this table, we observe that after 1 turn, the shapes look the same as the given shapes.



Application

We can arrange figures and shapes to form patterns. Repeating patterns make designs on walls, floors, carpets, curtains and so on. Rangolis are the best example of patterns and designs that we make using shapes.

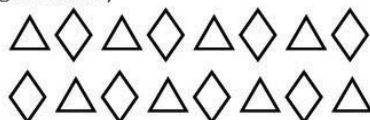


Let us see a few examples of creating designs using geometrical shapes.

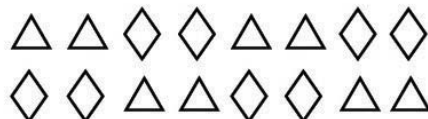
Example 5: Draw three patterns using a triangle and a diamond.

Solution: Many different patterns can be drawn using a triangle and a diamond. Some of them are as follows:

a) Repeating alternately



b) Taking two of each shape and arranging them alternately



Transactional Tip(s)

Duration: 15 min



Guided Learning:

- Ask learners to share and solve each part of TB: Pg. 20, 21, Examples 5, 6 and explain them to the class.
- Ask learners to choose make 5 different patterns by repeating and rotating.

Class Pulse Check

1) -

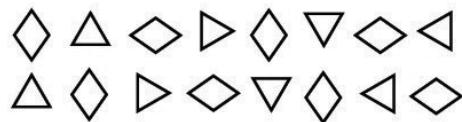


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–



c) Rotating the shapes by a quarter turn



Example 6: Draw a pattern using a circle and a square by repeating the design.

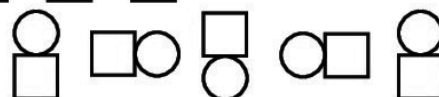
a) Repeat by giving a $\frac{1}{4}$ turn every time.

b) Create another pattern by rotating the design by $\frac{1}{2}$ turn.

Solution: Examples of patterns drawn using a circle and a square are shown below.



a) $\frac{1}{4}$ turn:



b) $\frac{1}{2}$ turn:



We observe that we get the original shape after the number of steps equal to the denominator of the turn. So, in a $\frac{1}{3}$ turn, we get the original shape after three steps. In a

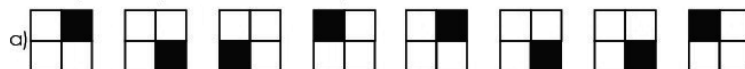
$\frac{1}{4}$ turn, we get the original shape after four steps and so on.



Higher Order Thinking Skills (H.O.T.S.)

In some designs we find that there is a missing shape or a turn which makes the design defective. Let us try to identify such defects in designs through a few examples.

Example 7: Identify the shape that breaks the pattern and circle it.



Important Words

–

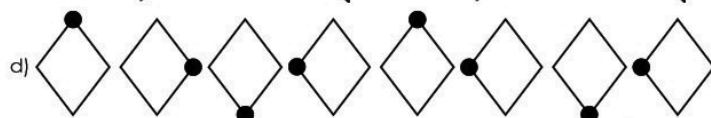
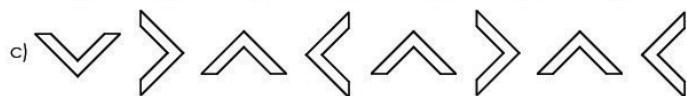
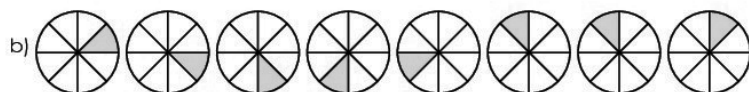
Transactional Tip(s)

Duration: 15 min

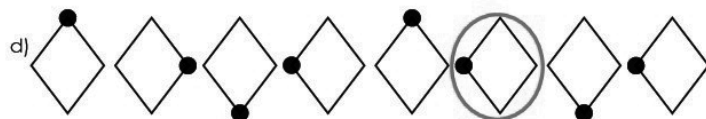
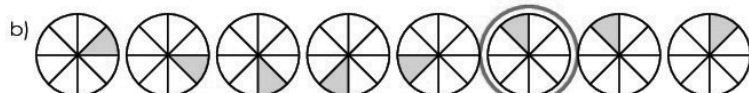
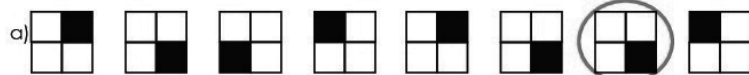


Interactive Discussion:

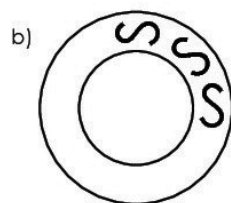
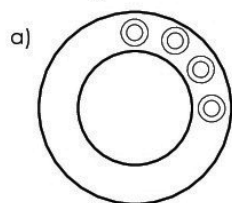
- Ask the learners to observe the patterns given in TB: Pgs. 22,23, Example 8. Encourage learners to predict the missing parts in the pattern.
- Ask any one learner to draw on the blackboard the correct shape to remove the defect from the patterns in TB: Pg. 21, 22 Example 7. Ask all learners to help and discuss the correct answer.
- Solve and discuss :
 - TB: Pg. 30, 31, Drill Time Q. 1-3.
 - WB: Pgs. 23, 24, Q. 21, 22.



Solution:



Example 8: Renu was painting ceramic plates with some designs as shown. Complete the designs.



Class Pulse Check

1) -



Annual Day:
13/61

Day:
4/4

Actual Date:

Page(s)
23

Important Words

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Transactional Tip(s)

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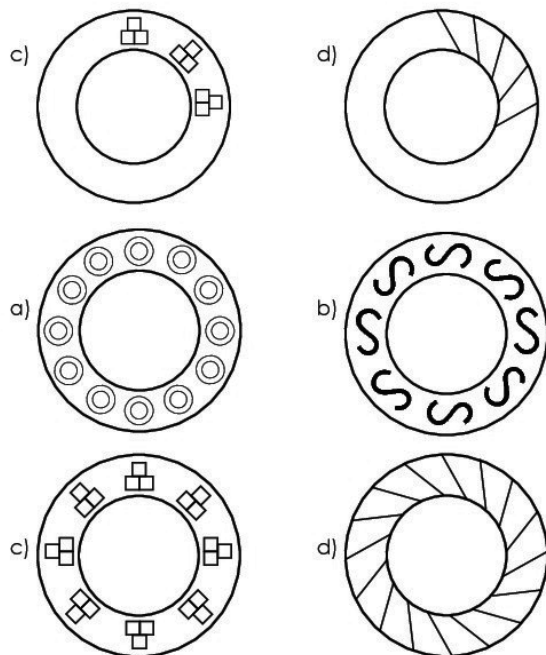


Class Pulse Check

1) -



Solution:



Concept 2.2: Patterns in Numbers







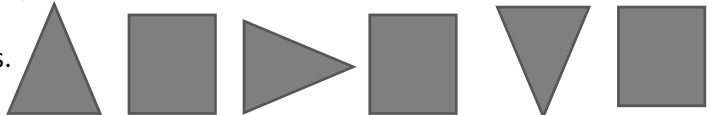
Think










Pooja learnt about even and odd numbers, multiples of 10 and 100. She observed that there is a pattern in such numbers. Pooja was curious to know if any other number patterns are possible.

Do you also want to know?



C – Exit Assessment

	Suggested questions to test the learning objective(s)	Learning objective(s)	Number of learners who answered correctly
1	Complete the shape.  (Ans. )	Period 1 - rotation of shapes	
2	Draw an asymmetric shape. (Ans. Learner's response)	Period 1 - rotation of shapes	
3	Turn the symbol '+' anti-clockwise by a quarter turn. How does it look? (Ans. +)		
4	Draw a pattern using shapes  and  . Rotate the shapes by a 1/4 turn. (Ans. )	Period 3 - arranging figures and shapes to form patterns	

Post-lesson Reflection				Handhold Learners		Challenge Learners	
TB completed Yes <input type="checkbox"/> No <input type="checkbox"/> WB completed Yes <input type="checkbox"/> No <input type="checkbox"/>				Names			
Enthusiastic participation  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>				Exam Revision Strategy		Reteach <input type="checkbox"/> Revise <input type="checkbox"/> Practise <input type="checkbox"/>	
Concept clarity in the classroom  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>				App Report		Number _____ Signature _____	
Concept clarity through the workbook  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>							

A – Curriculum to Learning Objectives: Patterns

Prior Knowledge		• Number sense, addition, subtraction, skip counting				
Class	Ch. No.	Chapter Name	C. No.	Concept Name	L. Obj. No.	Learning Objectives
1	2	Patterns	2.1	Patterns in Our Surroundings	2.1.a	• patterns in shapes
					2.1.b	• patterns in numbers
2	2	Patterns	2.1	Patterns Using Shapes	2.1.a	• identifying basic shape(s) in a pattern
					2.1.b	• creating patterns using objects, shapes and numbers
3	3	Numbers	2.1	Patterns in Shapes and Numbers	2.1.a	• identifying and creating patterns in shapes and numbers
					2.1.b	• tiling of the given shape
4	2	Patterns	2.1	Patterns based on Symmetry	2.1.a	• patterns in lines and shapes
					2.1.b	• number patterns
					2.1.c	• line and axis of symmetry
					2.1.d	• growing and reducing patterns
5	2	Patterns	2.1	Patterns in Rotation	2.1.a	• rotation of shapes
					2.1.b	• arranging figures and shapes to form patterns
			2.2	Patterns in Numbers	2.2.a	• patterns in numbers

B – Vision-to-Action Plan: 2.2 Patterns in Numbers

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
1 DD/MM/YYYY	23-26 – THK, RCL, REM/UND	2.2.a	<ul style="list-style-type: none"> Observe/Recall patterns formed by numbers. Observe patterns in sums, triangular numbers, square numbers. 	<ul style="list-style-type: none"> Questioning Using Concrete Material 	<ul style="list-style-type: none"> pebbles/ stones 	TB: Pg. 25 (Examples 9, 10) WB: Pg. 25 (Q. 7-9) WB: Pg. 26 (Q. 13, 14)	WB: Pg. 25 (Q. 1-6) WB: Pg. 25 (Q. 10-12, 15, 16)	
2 DD/MM/YYYY	26-28 –APP, HOTS	2.2.a	<ul style="list-style-type: none"> Observe and complete patterns in numbers. 	<ul style="list-style-type: none"> Peer Learning Interactive Discussion 	<ul style="list-style-type: none"> calendar 	WB: Pgs. 27, 28 (Q. 17, 19, 20) TB: Pg. 27 (Examples 11, 12)	WB: Pg. 27 (Q. 18) WB: Pgs. 28, 29 (Q. 21, 22)	
3 DD/MM/YYYY	29, 31, 32 – HOTS, Drill Time	2.2.a	<ul style="list-style-type: none"> Observe number patterns in our daily lives using examples. 	<ul style="list-style-type: none"> Interactive Discussion Practising 	–	TB: Pg. 29 (Example 14) TB: Pg. 33 (Drill Time Q. 4-6)	–	

Annual Day:
14/61

Day:
1/3

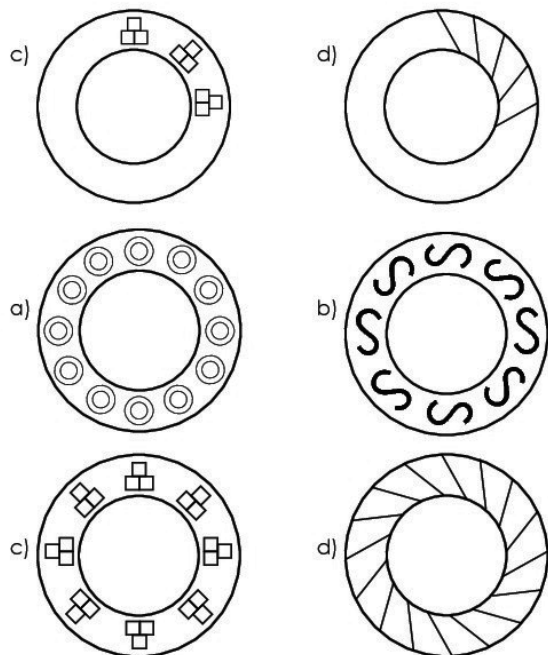
Actual Date:

Page(s)
23,24,25

Important Words

–

Solution:



Concept 2.2: Patterns in Numbers



Think

Pooja learnt about even and odd numbers, multiples of 10 and 100. She observed that there is a pattern in such numbers. Pooja was curious to know if any other number patterns are possible.

Do you also want to know?

Transactional Tip(s)

Duration: 12 min



Questioning:

- Give an example of a number pattern that increases by 2 in every step.
- Organise a quiz by dividing the class into three groups.
- Ask each group, one by one, to observe in TB: Pg. 24, 'Recall' section the and fill in the missing spaces in the patterns.
- Whichever group is unable to answer correctly loses points and the question passes to the next group.
- Solve and discuss patterns which learners could not solve.

Class Pulse Check

1) -





Recall

We have learnt that we can make patterns with numbers by repeating them in a certain sequence, increasing or decreasing the values or both.

For example, 1, 3, 5, 7, 9... is a pattern, which increases by 2 in every step.

125, 120, 115, 110, 105... is a pattern, which decreases by 5 in every step.

Let us revise the concept by completing the following patterns.

- a) 2, 5, 8, 11, _____, _____, _____.
- b) 2, 22, 222, _____, _____, _____.
- c) 3, 8, 13, 18, _____, _____.
- d) 2, 4, 8, _____, _____.
- e) 3, 6, 12, _____, _____.



Remembering and Understanding

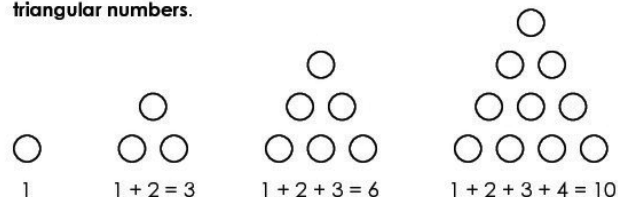
Patterns of numbers always have a fixed rule. All the numbers of a pattern follow a certain rule.

Let us now look at some patterns in sums and products of numbers.

Patterns in sums: Consider these sums:

- a) $1 + 2 + 3 = 6$
- $2 + 3 + 4 = 9$ ($6 + 3$)
- $3 + 4 + 5 = 12$ ($9 + 3$) and so on
- b) $1 + 2 + 3 + 4 = 10$
- $2 + 3 + 4 + 5 = 14$ ($10 + 4$)
- $3 + 4 + 5 + 6 = 18$ ($14 + 4$) and so on.

Triangular numbers: Numbers that can be arranged as dots to form a triangle are called triangular numbers.



Important Words

Duration: 1 min

- **Today:** triangular numbers, square numbers, fixed rule, patterns in sums

Transactional Tip(s)

Duration: 16 min



Using Concrete Material:

- Use pebbles/stones to explain the sums that involve patterns.
- Take 6 pebbles, ask the learners to write the count in their notebook, now add 3 pebbles and again ask them to write the count.
- Keep adding 3 pebbles and ask the learners to write the count each time.
- Now ask them to observe the numbers and identify the pattern.
- Use pebbles to explain triangular number pattern and square number pattern in the way explained above. Arrange the pebbles in a growing triangle or square as shown on TB: Pgs. 24, 25.
- Solve and discuss:
 - TB: Pg. 25, 26, Examples 9, 10,
 - WB: Pg. 25, Q. 7-9.

Class Pulse Check

Duration: 1 min



- 1) Give an example of perfect square number.

Annual Day:
14/61

Day:
1/3

Actual Date:

Page(s)
25

Important Words

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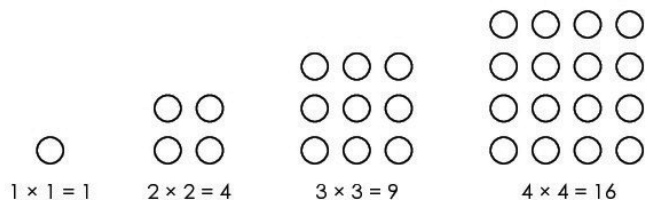
Transactional Tip(s)

–



So, the numbers 1, 3, 6, 10 and so on are **triangular numbers**.

Square numbers: Numbers that can be arranged as dots to form a square are called **square numbers**.



So, the numbers 1, 4, 9, 16, and so on are square numbers.

Let us see a few examples where numbers follow a particular rule to form a pattern.

Example 9: Complete the following pattern of numbers.
2, 5, 10, 17, __, __.

Solution:
 $(1 \times 1) + 1 = 2$
 $(2 \times 2) + 1 = 5$
 $(3 \times 3) + 1 = 10$
 $(4 \times 4) + 1 = 17$

Similarly, $(5 \times 5) + 1 = 26$ and $(6 \times 6) + 1 = 37$.

Therefore, the missing numbers are 26 and 37.

Example 10: Fill in the blanks.

a) $1 = 1 \times 1$
 $1 + 3 = 4 = 2 \times 2$
 $1 + 3 + 5 = 9 = 3 \times 3$
 $1 + 3 + 5 + 7 = 16 = 4 \times 4$
 $1 + 3 + 5 + 7 + 9 = \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$
 $\underline{\hspace{2cm}} = \underline{\hspace{2cm}} = 6 \times 6$

b) $1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 = 55$
 $11 + 12 + 13 + 14 + 15 + 16 + 17 + 18 + 19 + 20 = 155$
 $\underline{\hspace{2cm}} = 255$
 $31 + 32 + 33 + 34 + 35 + 36 + 37 + 38 + 39 + 40 = \underline{\hspace{2cm}}$

Class Pulse Check

1) -



Annual Day:
15/61

Day:
2/3

Actual Date:

Page(s)
26,27,28

Solution:

a) Looking at the pattern of the given numbers, we can say,

$$1 + 3 + 5 + 7 + 9 = 25 = 5 \times 5$$

Similarly, the next number can be obtained by adding 11

$$1 + 3 + 5 + 7 + 9 + 11 = 36 = 6 \times 6$$

b) $21 + 22 + 23 + 24 + 25 + 26 + 27 + 28 + 29 + 30 = 255$

If we look at the pattern of the sum in each step, we can see the difference between first two sums, $155 - 55 = 100$ and difference between the next two sums, $255 - 155 = 100$ and so on.

Therefore, the difference between the third and fourth sums is 100.

So, the fourth sum is $255 + 100 = 355$.



Application

One of the most common applications of patterns of numbers is used to remember the multiplication table of 9.

9x1	9x2	9x3	9x4	9x5	9x6	9x7	9x8	9x9	9x10
09	18	27	36	45	54	63	72	81	90

Look at the multiplication table of 9. We observe that in the products, the ones digit decreases from 9 to 0 and the tens digit increases from 0 to 9.

Important Words

Duration: 1 min

- **Last class:** triangular numbers, square numbers, fixed rule, patterns in sums
- **Today:** –

Transactional Tip(s)

Duration: 15 min



Peer Learning - Pair/Group:

- Divide the class in pairs.
- Ask each learner to give a rule to their partner from which they can form patterns. For example, a rule can be a pattern that begins with 3 and increases by 2.
- At the same time, the other learner of the pair will add 1 to each number of the rule and form a pattern.
- Read out and discuss TB: Pg. 26, 'Application' section. Have learners share with their partners what patterns they can find in multiplication tables.
- Solve and discuss:
 - TB: Pg. 27, Examples 11, 12,
 - WB: Pgs. 27, 28, Q. 17, 19, 20.

Class Pulse Check



1) -

We also observe pattern in numbers in our daily life. Let us look at a few examples to learn more about them.

Example 11: Jahnvi deposits ₹ 2000 in a bank. After the 1st week, her money increases to ₹ 2150. In the 2nd week, she notices that it has increased to ₹ 2300. In the 3rd week, it increases to ₹ 2450. How much money will she have after the 5th week?

Solution: From the problem, the amount of money Jahnvi has in the 1st, 2nd, 3rd and 4th weeks are ₹ 2000, ₹ 2150, ₹ 2300 and ₹ 2450 respectively.

Difference in the amounts in the 1st week and the 2nd week

$$= ₹ (2150 - 2000) = ₹ 150$$

Similarly, we can see that the difference in the amounts between any two consecutive weeks is ₹ 150.

Therefore, the money Jahnvi will have after the 5th week

$$= ₹ 2450 + ₹ 150$$

$$= ₹ 2600$$

Example 12: Complete the following patterns.

a) $1 \times 1 = 1$

$$11 \times 11 = 121$$

$$111 \times 111 = 12321$$

$$111111 \times 111111 = \underline{\hspace{2cm}}$$

b) $11 \times 11 = 121$

$$101 \times 101 = 10201$$

$$1001 \times 1001 = 1002001$$

$$100001 \times 100001 = \underline{\hspace{2cm}}$$

Solution: a) We can see that 111 has three digits in the number. The product

$$111 \times 111 = 12321, \text{ has the middle digit } 3.$$

Similarly, 11 has two digits. The product $11 \times 11 = 121$, has the middle digit 2.

Similarly, 111111 has six digits.

$$\text{Therefore, } 111111 \times 111111 = 12345654321.$$

b) If we observe the products, we see that all of them have 2 in the middle. All of them start and end with 1. The number of '0s' between 2 and 1 is equal to the number of '0s' in the number itself.

$$\text{Therefore, } 100001 \times 100001 = 10000200001.$$

Transactional Tip(s)

-



Class Pulse Check

1) -



Annual Day:
15/61

Day:
2/3

Actual Date:

Page(s)
28



Higher Order Thinking Skills (H.O.T.S.)

Patterns can be found in numbers on a calendar too. Observe the numbers in the 3×3 grids highlighted on the calendar shown here.

- 1) Sum of all the 9 numbers in the grid =

$$1 + 2 + 3 + 8 + 9 + 10 + 15 + 16 + 17 = 81$$

Product of 9 and the number at the centre of the grid = $9 \times 9 = 81$

- 2) Sum of the 9 numbers

$$= 5 + 6 + 7 + 12 + 13 + 14 + 19 + 20 + 21 = 117$$

The product of 9 and the number at the centre of the grid = $9 \times 13 = 117$

So, in the calendar, any 3×3 grid has the sum of all the 9 numbers equal to the product of 9 and the number at its centre.

March 2018						
M	T	W	Th	F	S	Su
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Example 13: A certain sample had 1 bacterium on the first day. On the 2nd day, there were 3 bacteria in the sample. On the 3rd day, there were 9 bacteria and on the 4th day, they became 27 in number. How many bacteria would be there in the sample on the 7th day?

Solution: The number of bacteria in the sample on the 1st, 2nd, 3rd and 4th days are 1, 3, 9 and 27 respectively.

If we observe the pattern, we find that

The 2nd number is thrice the 1st number: $3 = 3 \times 1$

The 3rd number is thrice the 2nd number: $9 = 3 \times 3$

The 4th number is thrice the 3rd number: $27 = 3 \times 9$

Similarly, the number of bacteria in the sample on the 5th day

$$= 3 \times 27 = 81$$

The number of bacteria in the sample on the 6th day = $3 \times 81 = 243$

Therefore, the number of bacteria in the sample on the 7th day

$$= 3 \times 243 = 729$$

Important Words

- Today: calendar

Transactional Tip(s)

Duration: 14 min



Interactive Discussion:

- Display the calendar in the class for the month of March and demonstrate a few patterns made by the dates as shown in the textbook.
- Ask learners to observe and discuss some more patterns in the calendar. Ask learners to explain how that pattern is made.
- Ask each learner to answer TB: Pg. 29, Example 13 one by one, and discuss the solution with learners.

Note: The calendar on TB: Pg. 28 is mistakenly marked as March 2018 but it actually shows March 2019.

Class Pulse Check



- 1) -

Annual Day:
16/61

Day:
3/3

Actual Date:

Page(s)
29,30,31,32

Important Words

Duration: 1 min

- Last class: calendar
- Today: –

Example 14: Look at the pattern of numbers in the given table. These numbers are from the multiplication table of 7. Find the remaining numbers which are in table of 7.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200

Solution:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200

Transactional Tip(s)

Duration: 15 min



Interactive Discussion:

- Instruct learners to observe the table given in TB: Pg. 29, Example 14.
- Ask learners what pattern they observe in the shaded boxes.
- Then instruct them to shade the remaining boxes which are multiples of 7 and discuss the solution with learners.

Class Pulse Check



1) -

Annual Day:
16/61

Day:
3/3

Actual Date:

Page(s)
30

Important Words

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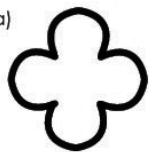


Drill Time

Concept 2.1: Patterns in Rotation

- 1) Rotate the following figures by $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$ turns and draw how they look after the turns.

a)



b)



c)



d)

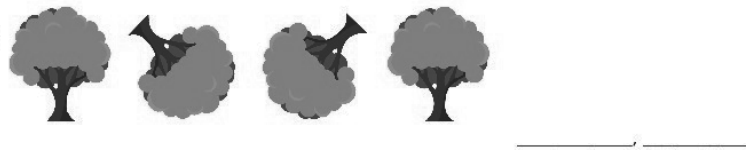


- 2) Complete these patterns.

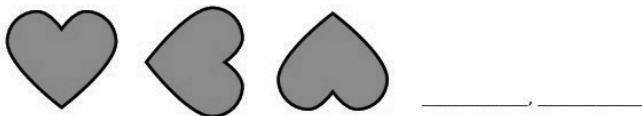
a)



b)



c)



d)



Transactional Tip(s)

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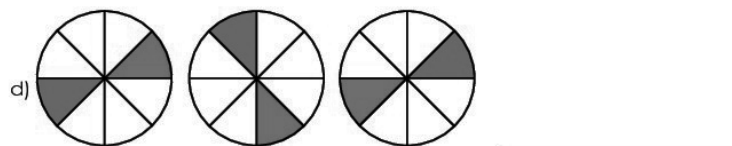
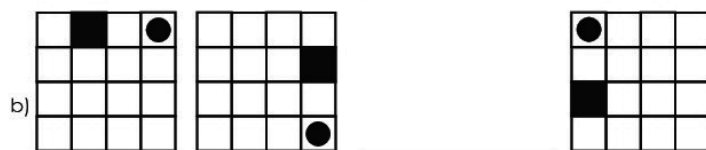
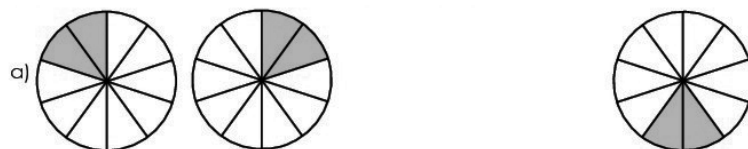


Class Pulse Check

1) -



3) Find the missing figure to complete the following patterns.



Concept 2.2: Patterns in Numbers

4) Complete the following patterns.

a) 2, 6, ____, 14, 18

b) 1, 12, 23, ____, 45

c) 17, 15, 13, 11, ____

d) 50, 41, ____, 23, 14

5) Complete the patterns given below.

a) 0, 2, 6, 12, 20, ____, 42

b) 2, 4, 8, 16, ____, 64

Transactional Tip(s)

Duration: 14 min



Practising:

- Ask learners to solve TB: Pg. 31, 32, Drill Time Q.4-6 in their notebooks and then discuss the result.
- Help learners whose result do not match with the rest of the class to understand and solve the problem.

Class Pulse Check

1) -



Annual Day:

16/61

Day:

3/3

Actual Date:

Page(s)

32

c) $22 \times 22 = 484$

$202 \times 202 = 40804$

$2002 \times 2002 = \underline{\hspace{2cm}}$

$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = 400080004$

d) $(9 - 1) \div 8 = 1$

$(98 - 2) \div 8 = 12$

$(\underline{\hspace{1cm}} - 3) \div 8 = 123$

$(9876 - 4) \div 8 = \underline{\hspace{2cm}}$

6) Word problems

a) Afzal has ₹ 1000 with him. He spends some amount while travelling to school everyday. At the end of Day 1, he has ₹ 965. Similarly, at the end of Day 2, Day 3 and Day 4 he found that he has ₹ 930, ₹ 895 and ₹ 860 respectively. How much money will Afzal have at the end of Day 5?

b) The jasmine creeper in Saritha's garden had 5 flowers on Monday, 10 flowers on Tuesday, 20 flowers on Wednesday and so on. How many flowers would bloom on the jasmine creeper on Sunday?

Important Words

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Transactional Tip(s)

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Class Pulse Check

1) -





C – Exit Assessment

	Suggested questions to test the learning objective(s)	Learning objective(s)	Number of learners who answered correctly
1	Complete the pattern: 6, 15, 24, ____, 42, 51. (Ans. 10)	Period 1 - patterns in numbers	
2	Circle the triangular number. A) 21 B) 27 C) 10 D) 15 (Ans. 27)	Period 1 - patterns in numbers	
3	Circle the square number. A) 51 B) 144 C) 101 D) 159 (Ans. 144)	Period 1 - patterns in numbers	
4	Complete the series: $(1 \times 1 + 1)$, $(2 \times 2 + 2)$, $(3 \times 3 + 3)$, _____. (Ans. $4 \times 4 + 4$)	Period 2 - patterns in numbers	
5	Complete the pattern 11, __, __, 41, __, 61. (Ans. 21, 31, 51)	Period 2 - patterns in numbers	

Post-lesson Reflection						
TB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	WB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Enthusiastic participation		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Concept clarity in the classroom		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Concept clarity through the workbook		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

	Handhold Learners	Challenge Learners
Names		
Exam Revision Strategy	Reteach <input type="checkbox"/>	Revise <input type="checkbox"/> Practise <input type="checkbox"/>
App Report	Number _____	Signature _____














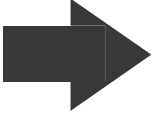
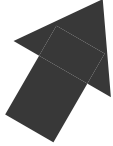

Teacher Reference: Textbook

Chapter 2: Patterns

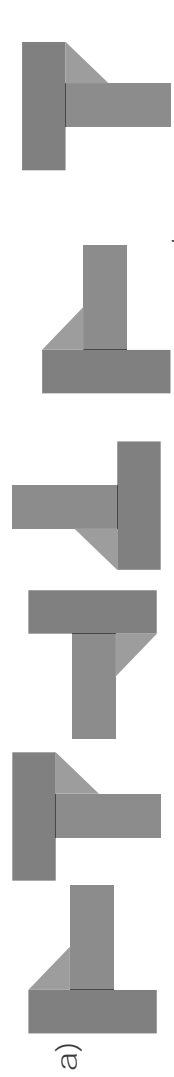
Concept 2.1: Patterns in Rotation

Drill Time

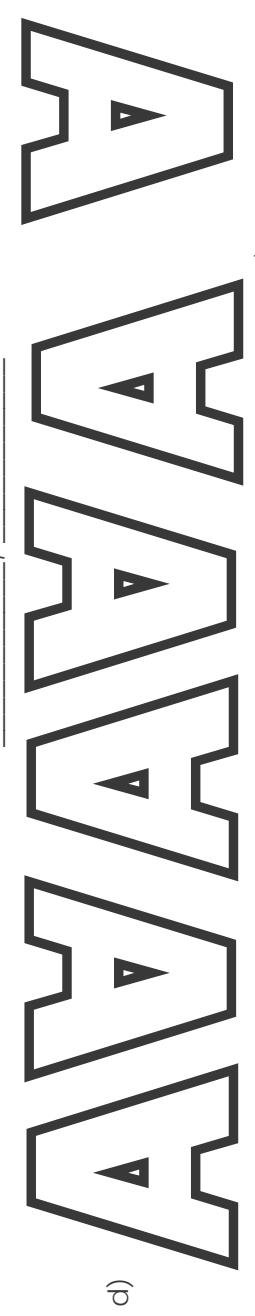
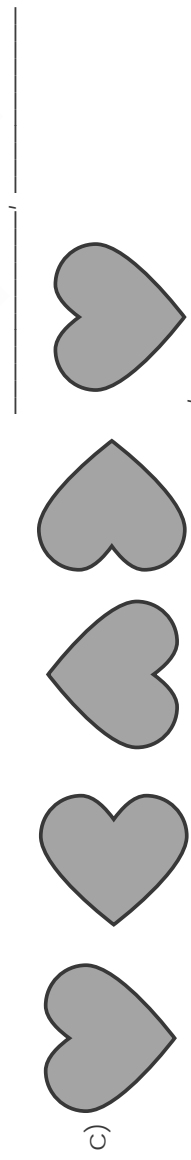
- 1) Rotate the following figures by $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$ turns and draw how they look after the turns.

Shape	$\frac{1}{2}$ turn	$\frac{1}{3}$ turn	$\frac{1}{4}$ turn
a) 			
b) 			
c) 			
d) 			

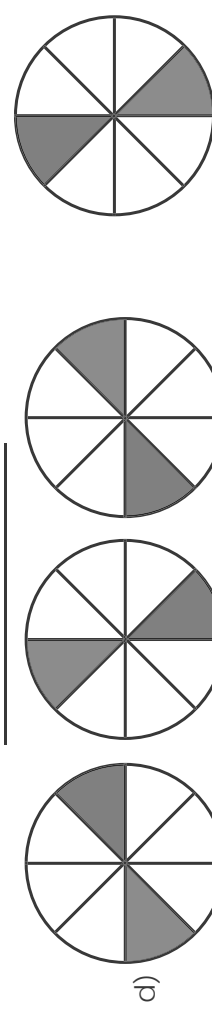
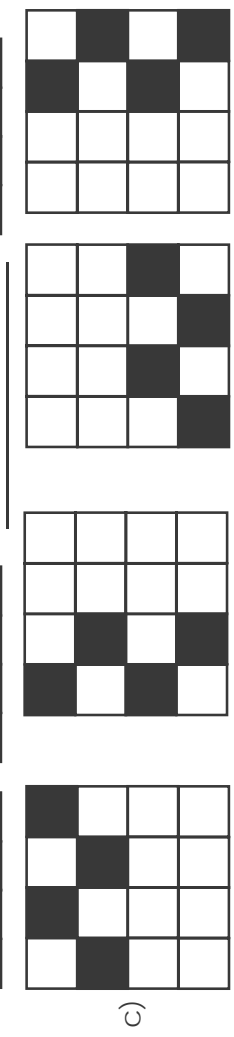
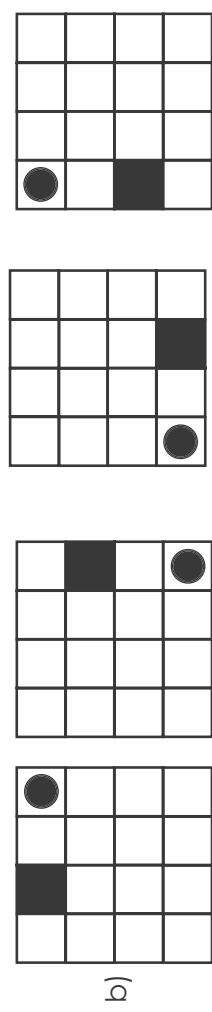
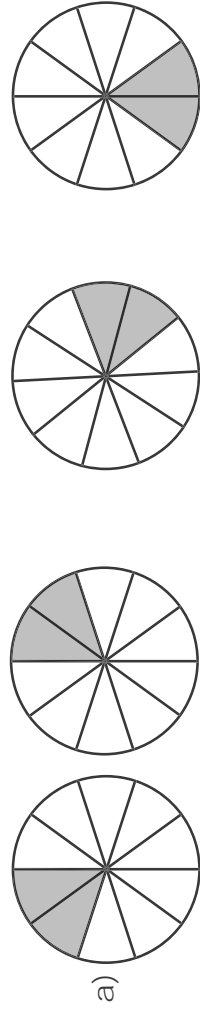
- 2) Complete these patterns:



Teacher Reference: Textbook



3) Find the missing figure to complete the following patterns.



Teacher Reference: Textbook

Chapter 2: Patterns

Concept 2.2: Patterns in Numbers

Drill Time

4) Complete the following patterns:

- a) 2, 6, 10, 14, 18 b) 1, 12, 23, 34, 45
c) 17, 15, 13, 11, 9 d) 50, 41, 32, 23, 14

5) Complete the patterns given:

a) 0, 2, 6, 12, 20, 30, 42

b) 2, 4, 8, 16, 32, 64

c) $22 \times 22 = 484$

$$202 \times 202 = 40804$$

$$2002 \times 2002 = \underline{4008004}$$

$$\underline{20002} \times \underline{20002} = 400080004$$

d) $(9 - 1) \div 8 = 1$

$$(98 - 2) \div 8 = 12$$

$$(\underline{987} - 3) \div 8 = 123$$

$$(9876 - 4) \div 8 = \underline{1234}$$

6) Word problems

a) Afzal has ₹ 1000 with him. He spends some amount while travelling to school everyday. At the end of Day 1, he has ₹ 965. Similarly, at the end of Day 2, Day 3 and Day 4 he found that he has ₹ 930, ₹ 895 and ₹ 860 respectively. How much money will Afzal have at the end of Day 5?

b) The jasmine creeper in Saritha's garden had 5 flowers on Monday, 10 flowers on Tuesday, 20 flowers on Wednesday and so on. How many flowers would bloom on the jasmine creeper on Sunday?

Solution: a) ₹ 825

b) 320 flowers

TB: Patterns



Patterns

Concept 2.1: Patterns in Rotation



Recall

Multiple Choice Questions

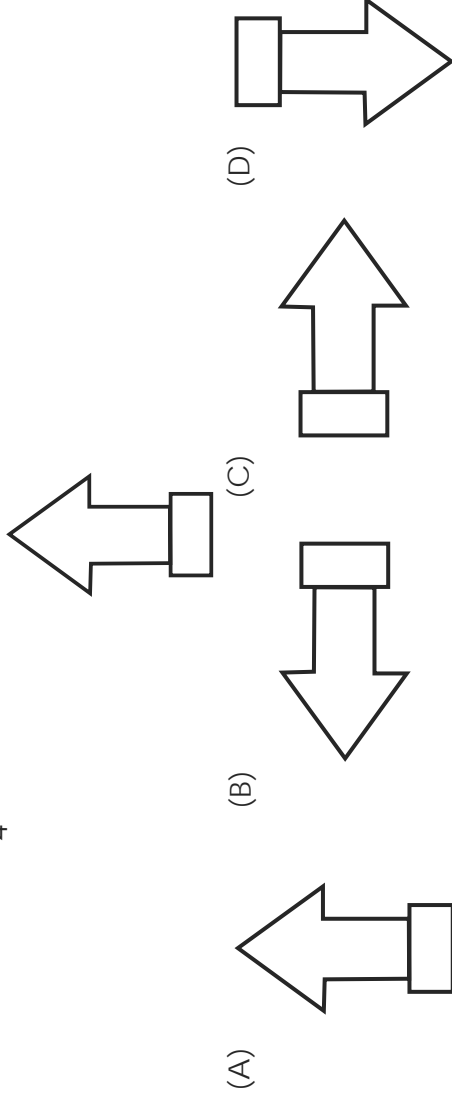
- 1) Which of the following letters is symmetrical? [B]
(A) F (B) D (C) R (D) Q
- 2) The letter ____ is symmetrical among the given letters. [B]
(A) S (B) C (C) P (D) F
- 3) The letter H has ____ line(s) of symmetry. [A]
(A) 2 (B) 3 (C) 1 (D) 0



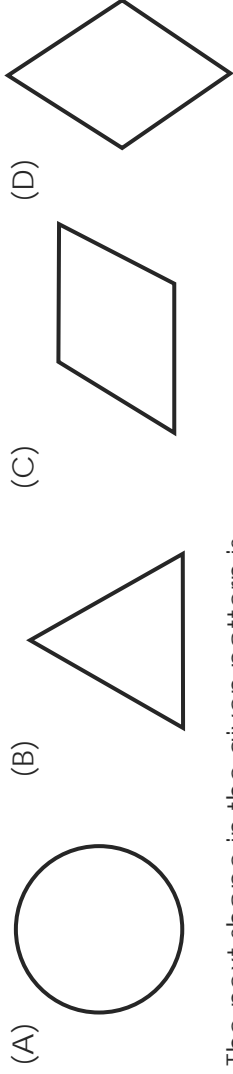
Remembering and Understanding

Multiple Choice Questions

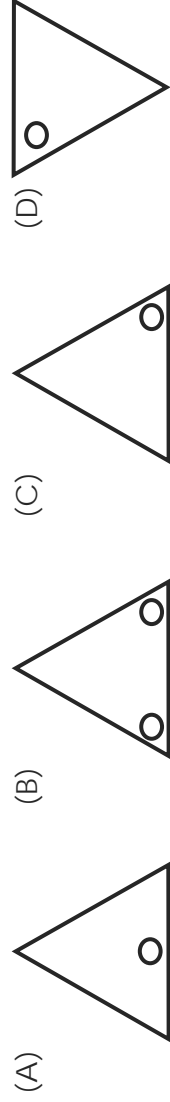
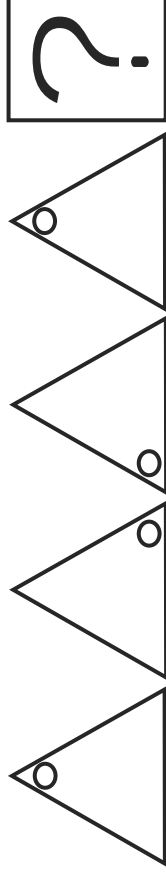
- 4) The anticlockwise $\frac{1}{4}$ turn of the given shape is _____. [B]



- 5) The shape that looks the same after $\frac{1}{4}$ turn and $\frac{1}{2}$ turn is _____. [A]



- 6) The next shape in the given pattern is _____. [C]

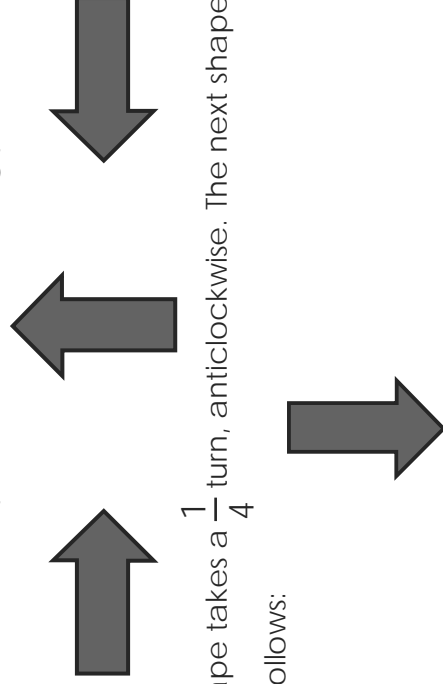


Fill in the Blanks

- 7) The line that divides a shape into symmetrical halves is called the _____ axis of symmetry.
- 8) Turning a shape in the clockwise direction is called _____ rotation _____ of the shape.
- 9) If a quarter turn is 90° rotation, then a one-third turn is _____ 120° rotation.

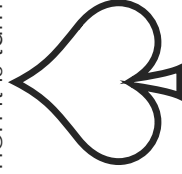
Very Short Answer Questions

- 10) Identify the turn that the shape takes in the following pattern. Draw the next shape.

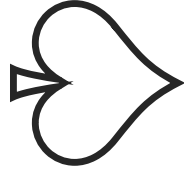


Solution: The given shape takes a $\frac{1}{4}$ turn, anticlockwise. The next shape in the pattern is as follows:

- 11) Draw how the given image looks when it is turned through $\frac{1}{2}$ turn.



Solution:



- 12) Draw how the given letter looks when it is turned through $\frac{1}{3}$ of a turn in the clockwise direction.



Solution:



Short Answer Questions

- 13) Show how the given shape looks when it is turned through $\frac{1}{2}$ turn and $\frac{1}{4}$ turn.



Solution:

$\frac{1}{2}$ turn :



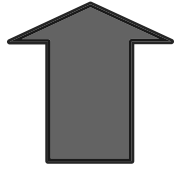
$\frac{1}{4}$ turn :



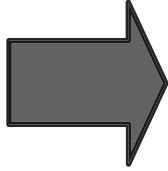
- 14) Draw the next two shapes for the following figure when it is turned through $\frac{1}{4}$ turn in the clockwise direction.

Solution:

First $\frac{1}{4}$ turn:



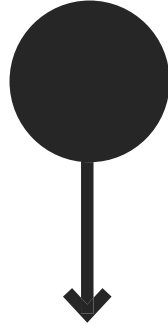
Second $\frac{1}{4}$ turn:



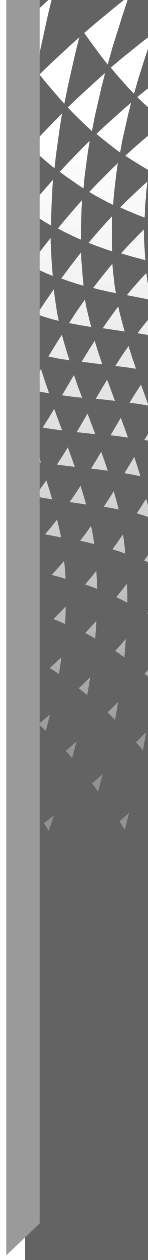
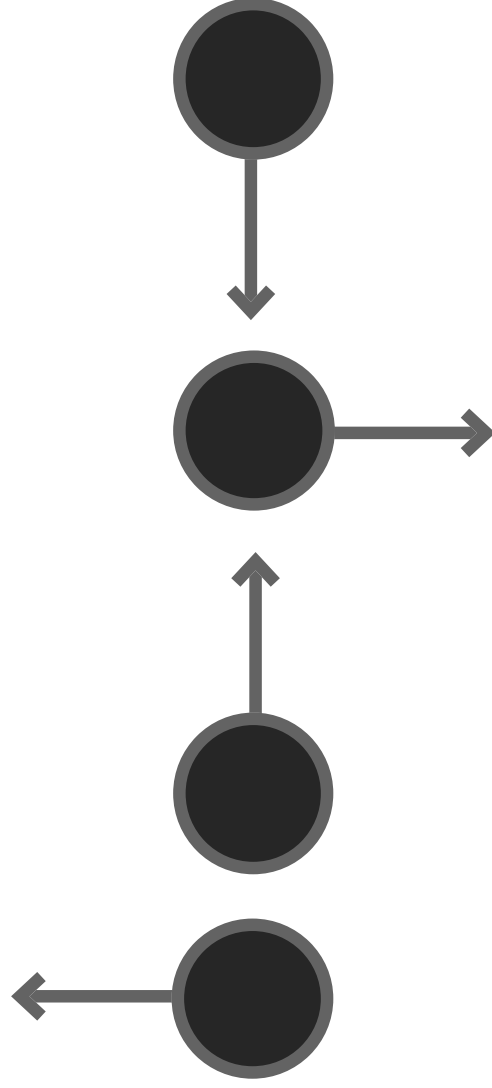
Long Answer Questions

- 15) Take the required number of $\frac{1}{4}$ turns for the given figure so that it gets back to its

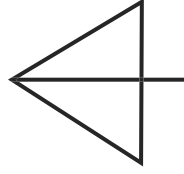
original position. Draw the shapes for each turn.



Solution:



- 16) Draw the $\frac{1}{4}$ and $\frac{1}{3}$ turns of the given figure in the clockwise and anticlockwise directions of the given figure.



Solution:

Direction of turn	$\frac{1}{4}$ turn	$\frac{1}{3}$ turn
Clockwise		
Anticlockwise		

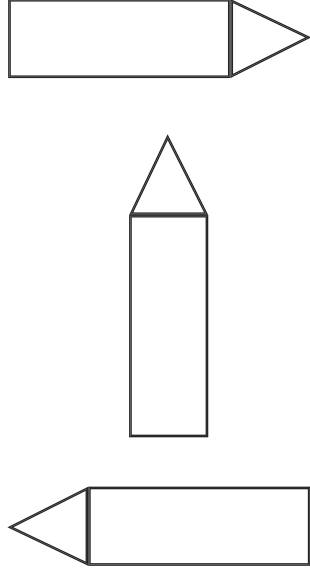


Application

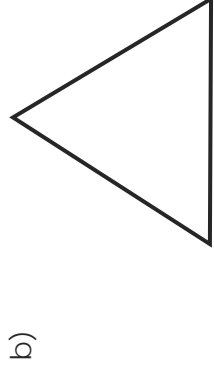
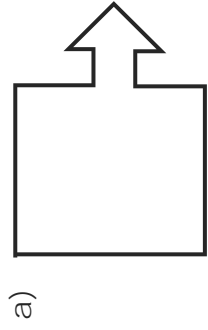
Short Answer Questions

- 17) Draw a shape using a rectangle and triangle. Repeat the shape twice by turning through $\frac{1}{4}$ turn clockwise each time.

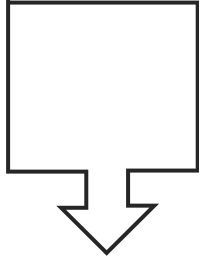
Solution: Learner's response



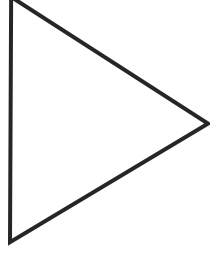
- 18) Draw the shapes after a $\frac{1}{2}$ turn of the given shapes.



Solution: . a)

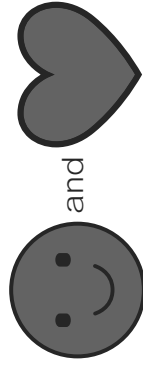


b)



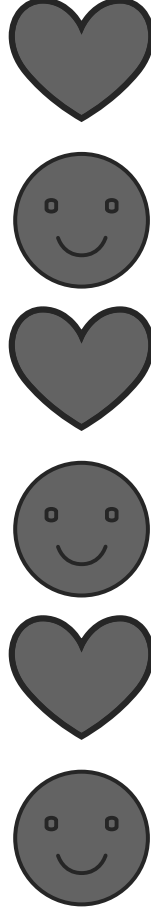
Long Answer Questions

- 19) Draw any two rotational patterns using . and .

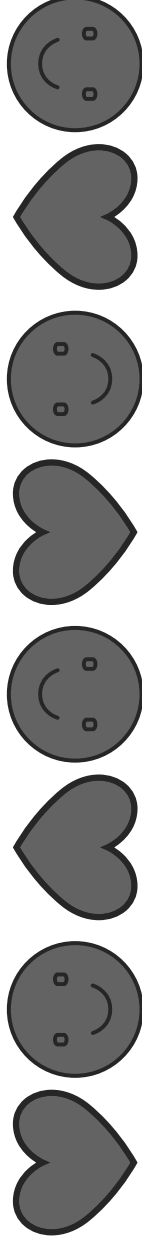


Solution: Learner's response

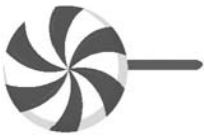







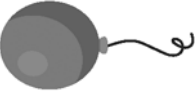




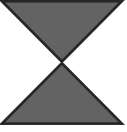


- a) By rotating in $\frac{1}{4}$ turn and repeating alternately.



- b) Rotating the shapes by half turn alternately.



- 20) Complete the table to show how the shape will look after the given number of turns in the anticlockwise direction.

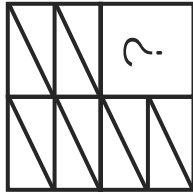
Shape	$\frac{1}{4}$ turn	$\frac{1}{2}$ turn	$\frac{1}{3}$ turn
			
			
			
			



Higher Order Thinking Skills (H.O.T.S.)

Short Answer Question

- 21) Complete the given pattern by drawing the missing piece.

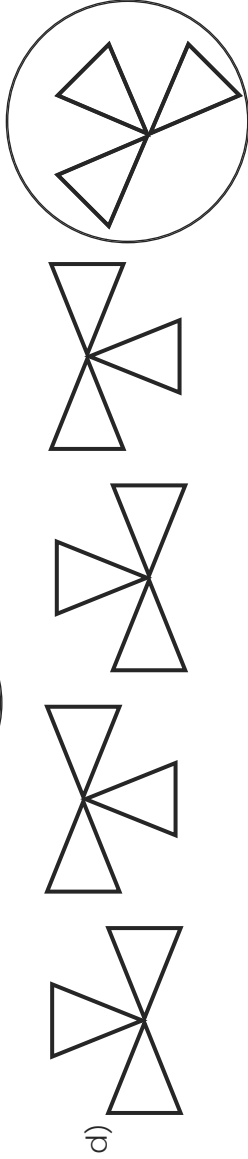
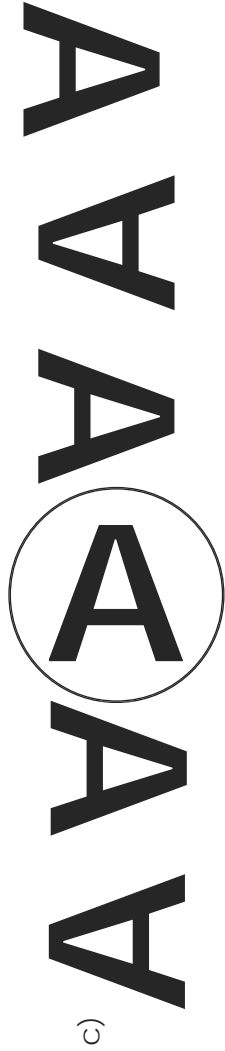
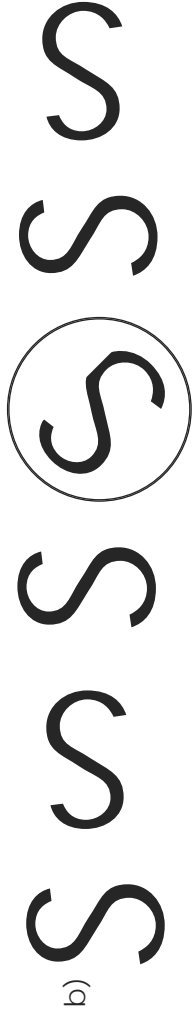
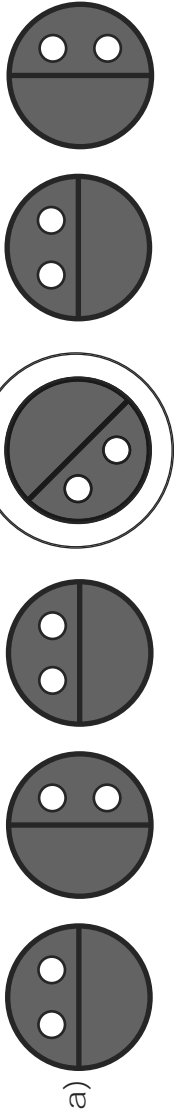


Solution:



Long Answer Question

22) Circle the shape that breaks the pattern.



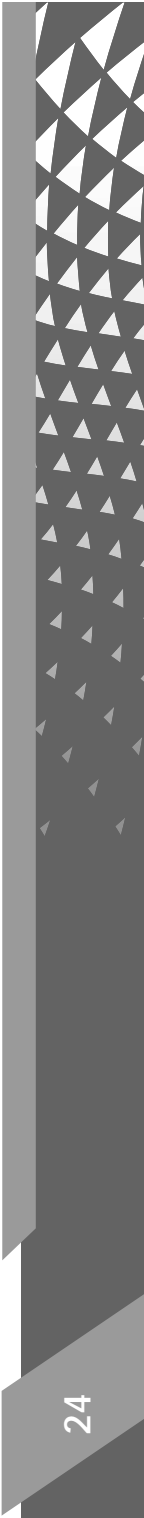
Concept 2.2: Patterns in Numbers



Recall

Multiple Choice Questions

- 1) The number that is next in the series 1, 3, 5, 7, 9... is _____. [B]
- (A) 12 (B) 11 (C) 15 (D) 13



- 2) The number that is next in the series 36, 34, 30, 28, 24... is _____. [**B**]
 (A) 20 (B) 22 (C) 18 (D) 17
- 3) The number that is next in the series 5, 10, 7, 12, 9... is _____. [**B**]
 (A) 15 (B) 14 (C) 16 (D) 13



Remembering and Understanding

Multiple Choice Questions

- 4) Find the missing term in the pattern 95, 88, 81, 74, 67, ?, 53, 46. [**B**]
 (A) 66 (B) 60 (C) 64 (D) 58
- 5) The next term in the pattern 4, 7, 10, 13... is _____. [**C**]
 (A) 24 (B) 20 (C) 16 (D) 28
- 6) The missing term in the pattern 3, 5, 8, 12, ? is _____. [**D**]
 (A) 18 (B) 24 (C) 16 (D) 17

Fill in the Blanks

- 7) 1, 12, 123, 1234, _____ **12345**
- 8) 20, 19, 17, 14, 10, _____ **5**
- 9) 13, 26, 39, _____ **52**

Very Short Answer Questions

- 10) Write the first four perfect squares.

Solution: **1, 4, 9, 16.**

- 11) Write the pattern from 25 to 100 with each of its terms increasing by 25.

Solution: **25, 50, 75, 100.**

- 12) Complete the pattern.

27, 25, 23, _____ **21** _____ **19** _____ **17** _____

Short Answer Questions

- 13) Observe the pattern and write the next two terms.

$$2 + 1 = 3$$

$$3 + 2 = 5$$

$$5 + 3 = 8$$

Solution: $8 + 4 = 12$

..... $12 + 5 = 17$

- 14) Observe the pattern and write the next two terms.

$$3 + 3 = 6$$

$$7 + 7 = 14$$

$$15 + 15 = 30$$

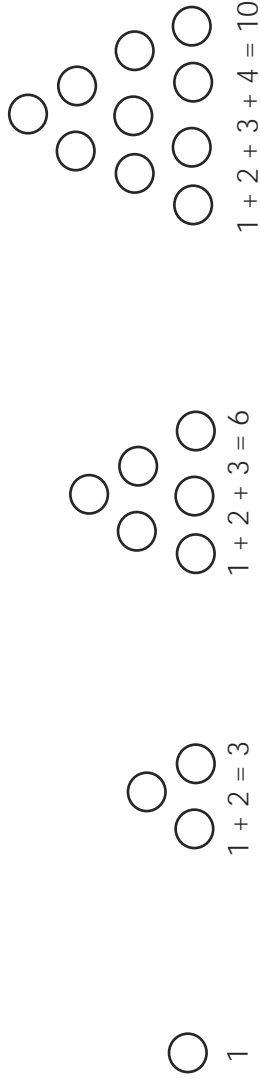
Solution: $31 + 31 = 62$

..... $63 + 63 = 126$

Long Answer Questions

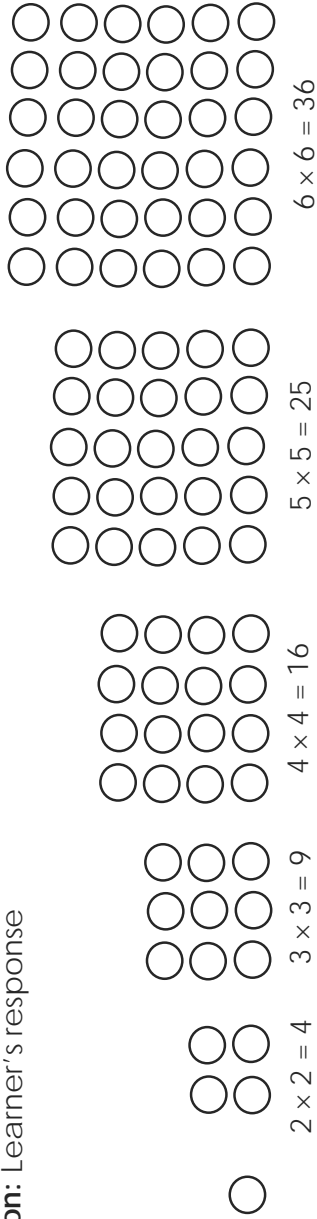
- 15) Write down the triangular numbers from 1 to 10 and show them using a diagram.

Solution: The triangular numbers from 1 to 10 are: 1, 3, 6, 10 .



- 16) Make a pattern of at least 6 square numbers.

Solution: Learner's response





Short Answer Questions

17) Complete the following patterns.

a) 5, 55, 555, 5555, 55555, 555555, 5555555, 55555555, 555555555.

b) 1, 11, 111, 1111, 11111, 111111, 1111111, 11111111.

18) The table shows the amount of money saved by Srujan every month.

₹ 56	₹ 112	₹ 224	₹ 448	₹ 896
January	February	March	April	May

If he continues to save in the same manner, what would his savings be in the month of August?

Solution: The pattern of Srujan's saving is ₹ 56, ₹ 112, ₹ 224, ₹ 448, ₹ 896, ...

We observe that every month his savings is double than that in the previous month...

₹ 112 = ₹ 56 × 2; ₹ 224 = ₹ 112 × 2 and so on.

So, his savings in June = ₹ 896 × 2 = ₹ 1792

In July, it is ₹ 1792 × 2 = ₹ 3584

In August, it is ₹ 3584 × 2 = ₹ 7168

Therefore, Srujan's savings in the month of August is ₹ 7168.

Long Answer Questions

19) Observe the pattern and write the next two terms.

a) 1, (1 + 2), (1 + 2 + 3), (1 + 2 + 3 + 4)...

b) (1 + 2) × 3, (2 + 3) × 4, (3 + 4) × 5...

Solution: a) The next two terms in 1, (1 + 2), (1 + 2 + 3), (1 + 2 + 3 + 4), ... are

..... (1 + 2 + 3 + 4 + 5) and (1 + 2 + 3 + 4 + 5 + 6).

b) The next two terms are (4 + 5) × 6, (5 + 6) × 7

.....

20) Observe the pattern and write the next two terms.

a) $9 \times 9 + 7 = 88$

$98 \times 9 + 6 = 888$

$987 \times 9 + 5 = 8888$

b) $2 + 4 + 6 + 8 = 20$

$12 + 14 + 16 + 18 = 60$

$22 + 24 + 26 + 28 = 100$

Solution: a) The next two terms are

$9876 \times 9 + 4 = 88888$ and

$98765 \times 9 + 3 = 888888$

b) The next two terms are

$32 + 34 + 36 + 38 = 140$ and

$42 + 44 + 46 + 48 = 180$



Higher Order Thinking Skills (H.O.T.S.)

Short Answer Question

21) Find the product of 5 and 4 using a pattern.

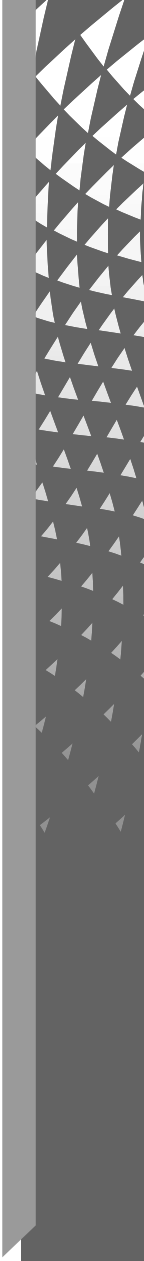
Solution: We know that $5 \times 4 = 20$

The sum of the first four even numbers $= 2 + 4 + 6 + 8 = 20$

So, the pattern of the product of 5 and 4 is $2 + 4 + 6 + 8$

.....

.....



Long Answer Question

- 22) Find the products using patterns.

a) 5×18

b) 5×22

Solution: a) $5 \times 18 = 2 + 4 + 6 + 8 + 10 + 12 + 14 + 16 + 18$

.....
 $90 =$ (sum of the first nine even numbers).....

b) $5 \times 22 = 2 + 4 + 6 + 8 + 10 + 12 + 14 + 16 + 18 + 20$

.....
 110 (sum of the first ten even numbers).....

.....


.....

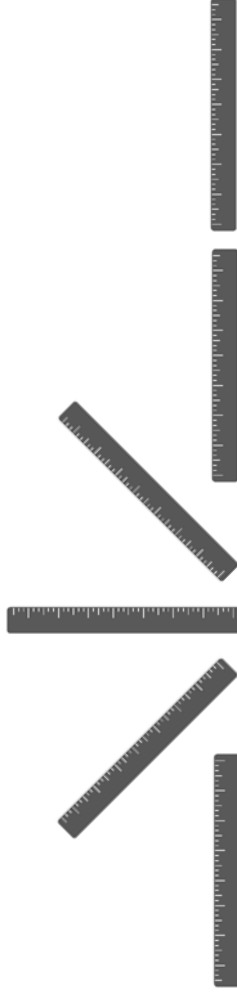
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Practice Questions

- 1) How many lines of symmetry does the letter L have?
- 2) Does a water bottle look the same after 1 turn clockwise?
- 3) How will the object  look after $\frac{1}{3}$ turn clockwise?
- 4) Complete the pattern by drawing the next figure.



- 5) Draw the missing figure.



- 6) Is the letter P asymmetrical?
- 7) Which object breaks the pattern?
- 8) The production in a sweet shop decreased every month. They prepared 130 sweets in January, 95 in February, 67 in March and 46 in April. If this pattern continues, how many sweets will it produce in May?
- 9) Starting with , turn the object four times by $\frac{1}{4}$ turn anticlockwise.
- 10) Starting with , turn the object by $\frac{1}{2}$ clockwise, 5 times.
- 11) Which object breaks the pattern?
- 12) On a painting, there are 32 dots in the first row, 44 dots in the second, 57 dots in the third and 71 in the fourth. If this pattern continues, how many dots are there in the fifth row?

Complete the following patterns.

- 13) $1 = 1$
 $4 = 1 + 3$
 $9 = 1 + 3 + 5$
 $16 = 1 + 3 + 5 + \underline{\hspace{1cm}}$
- 14) 3, 8, 13, 18, 23, $\underline{\hspace{1cm}}$
- 15) 1, 1, 2, 3, 5, 8
- 16) 1, 2, 6, $\underline{\hspace{1cm}}$, 120, 720
- 17) $1 \times 2 + 1 = 3$
 $3 \times 3 + 2 = 11$
 $\underline{\hspace{1cm}} \times 4 + 3 = 47$
 $47 \times 5 + 4 = \underline{\hspace{1cm}}$
- 18) 1, 8, 43, $\underline{\hspace{1cm}}$, 1093 (Hint: multiply by 5 and add 3)
- 19) 2, 10, 20, $\underline{\hspace{1cm}}$, 200
- 20) 1, 5, 3, 7, 5, 9, $\underline{\hspace{1cm}}$

Chapter 2: Patterns



- WB: Patterns

A – Curriculum to Learning Objectives: Numbers

Prior Knowledge		• Number sense, place value system, counting				
Class	Ch. No.	Chapter Name	C. No.	Concept Name	L. Obj. No.	Learning Objectives
1	3	Numbers	3.1	Count in Ones and Tens	3.1.a	• the concept of zero
					3.1.b	• the sequence of numbers up to 99
					3.1.c	• place value and face value of numbers
					3.1.d	• writing number names
			3.2	Compare 2-digit Numbers	3.2.a	• comparing, ordering and forming numbers
2	3	Numbers	3.1	Count by Hundreds	3.1.a	• reading and writing numerals and number names up to 999
					3.1.b	• represent 3-digit numbers on an abacus
					3.1.c	• place values, face values and expanded forms of numbers
			3.3	Compare 3-digit Numbers	3.3.a	• comparing two numbers
					3.3.b	• ascending and descending orders
					3.3.c	• forming the greatest and the smallest 3-digit numbers
3	3	Numbers	3.1	Count by Thousands	3.1.a	• writing 4-digit numbers with place value chart
					3.1.b	• writing the standard and the expanded forms of the number
			3.2	Compare 4-digit Numbers	3.2.a	• comparing and ordering numbers
					3.2.b	• identifying and forming the greatest and the smallest number
4	3	Numbers	3.1	Count by Ten Thousands	3.1.a	• smallest and largest 4-digit and 5-digit numbers
					3.1.b	• reading and writing 5-digit numbers
					3.1.c	• finding the place value and the face value of the numbers
			3.2	Compare and Order 5-digit Numbers	3.2.a	• comparing and ordering 5-digit numbers
					3.2.b	• forming the largest and the smallest 5-digit number
5	3	Large Numbers	3.1	Indian and International Systems of Numeration	3.1.a	• reading and writing 6-digit, 7-digit and 8-digit numbers
					3.1.b	• the Indian and the International systems of numeration
					3.1.c	• comparing and ordering numbers

B – Vision-to-Action Plan: 3.1 Indian and International Systems of Numeration

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
1 DD/MM/YYYY	33, 34 – THK, RCL	3.1.a	<ul style="list-style-type: none"> Recall 6-digit numbers in the Indian system using the place value chart. 	<ul style="list-style-type: none"> Activity Method 	<ul style="list-style-type: none"> Place Value Cards 	WB: Pg. 31 (Q. 1-3)	WB: Pgs. 31 (Q. 4-6)	
2 DD/MM/YYYY	34, 35 – REM/UND	3.1.a	<ul style="list-style-type: none"> Identify number names of 8-digits using the Indian system of numbering. 	<ul style="list-style-type: none"> Direct Instruction Interactive Discussion 	<ul style="list-style-type: none"> Place Value Board 	WB: Pg. 32 (Q. 11, 12) WB: Pg. 33 (Q. 15)	WB: Pg. 32 (Q. 7, 8)	
3 DD/MM/YYYY	36, 37 – REM/UND	3.1.b	<ul style="list-style-type: none"> Name and identify numbers in the international number system. Interpret the equivalents of numbers in Indian and International system. 	<ul style="list-style-type: none"> Interactive Discussion 	–	TB: Pg. 37 (Example 1) WB: Pg. 32 (Q.9, 10) WB: Pg. 32 (Q. 13, 14) TB: Pg. 38 (Example 2a, 2b) WB: Pg. 33 (Q. 16)	–	
4 DD/MM/YYYY	37-39 – APP	3.1.c	<ul style="list-style-type: none"> Compare large numbers. Arrange large numbers in ascending order and descending order. 	<ul style="list-style-type: none"> Guided Learning Activity Method 	–	TB: Pg. 38 (Example 3) WB: Pg. 34 (Q. 17)	WB: Pg. 34 (Q. 18)	

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
5 DD/MM/YYYY	39 – APP	3.1.c	<ul style="list-style-type: none"> Solve the real life applications of Indian and International number system. 	<ul style="list-style-type: none"> Interactive Discussion 	–	TB: Pg. 39 (Examples 4, 5) WB: Pg. 34 (Q. 19)	WB: Pg. 34 (Q. 20)	
6 DD/MM/YYYY	40, 44 – HOTS, Drill Time	3.1.c	<ul style="list-style-type: none"> Practice the skill of comparing large numbers, their place value and face value. 	<ul style="list-style-type: none"> Practising 	–	TB: Pg. 40 (Examples 6, 7) WB: Pg. 35 (Q. 21) TB: Pg. 44 (Drill Time Q. 1-4)	WB: Pg. 35 (Q. 22)	

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1/6

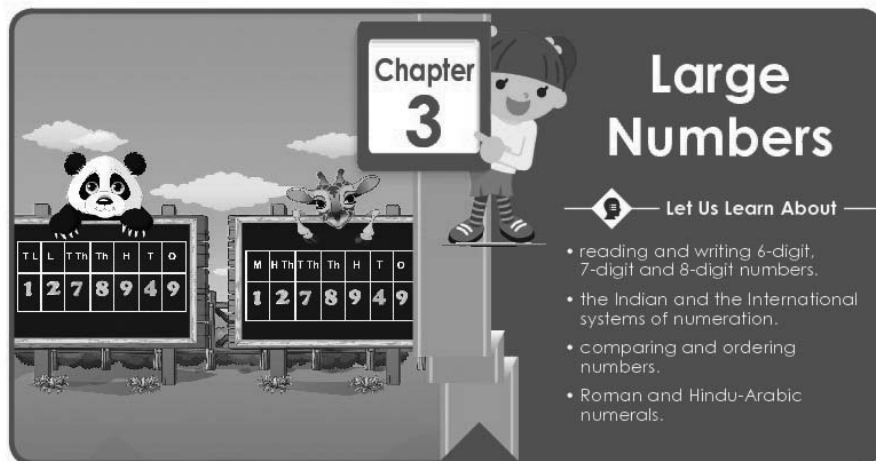
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Important Words

Duration: 1 min

- **Today:** place value, place value chart



Concept 3.1: Indian and International Systems of Numeration



Think

Pooja read 123456 as one lakh twenty-three thousand four hundred and fifty-six.

Her cousin who stays in the U.S. read it as one hundred twenty-three thousand four hundred and fifty-six. Who do you think is right?



Recall

We know how to read and write 5-digit numbers. The places of a 5-digit number are ones, tens, hundreds, thousands and ten thousands.

Place value chart

We can place the number 78265 in the place value chart as:

Ten thousands	Thousands	Hundreds	Tens	Ones
7	8	2	6	5

Transactional Tip(s)

Duration: 28 min



Activity Method:

- Read TB: Pg. 33, 'Think' section.
- Divide the class into two groups. Ask a member from the first group to write any 6-digit number on the blackboard. The other group has to read the number in the Indian system.
- Continue the activity where the groups challenge each other with various 6-digit numbers.
- Recall the concept of place value using the Classklap Place Value Cards.
- Summarise and practice the place value for Indian number System using place value chart as shown in TB: Pg.33.
- Solve and discuss WB: Pg. 31, Q. 1-3.

Class Pulse Check

Duration: 1 min



- 1) How many zeros are there in 1 lakh?

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Successor and predecessor

We know that the **successor** of a given number is 1 more than the given number. The **predecessor** of a given number is 1 less than the given number. Look at the table given here for better understanding.

Predecessor (Number - 1)	Number	Successor (Number + 1)
6,939	6,940	6,941
50,492	50,493	50,494
89,988	89,989	89,990



Remembering and Understanding

The largest 5-digit number is 99999. To find its successor, we add 1 to it.

L	T	Th	Th	H	T	O
	1	1	1	1		
	9	9	9	9	9	
+						1
	1	0	0	0	0	0

On doing so, we get a new place in the place value chart. It is called the **lakhs** place.

We write 'L' for lakhs.

100000 is read as one lakh. It is the smallest 6-digit number.

Some numbers beyond a lakh are as follows:

$$100000 + 1 = 100001 = \text{One lakh and one}$$

$$100000 + 50 = 100050 = \text{One lakh and fifty}$$

$$100000 + 400 = 100400 = \text{One lakh and four hundred}$$

$$100000 + 5000 = 105000 = \text{One lakh and five thousand}$$

Similarly, we get 7 lakhs, 8 lakhs and 9 lakhs and so on.

Hence, the smallest 6-digit number is 100000, and the largest 6-digit number is 999999.

999999 is read as nine lakhs ninety-nine thousand nine hundred and ninety-nine.

Important Words

Duration: 1 min

- **Last class:** place value, place value chart
- **Today:** Predecessor, successor, lakhs

Transactional Tip(s)

Duration: 12 min



Direct Instruction:

- Ask any learner, the largest 6-digit number and its successor.
- Draw a place value chart on the blackboard and explain how a 7-digit number would be written and read.
- Explain the naming of each place value of a 7-digit number in the place value chart, using TB: Pg. 35.
- Similarly, explain the steps for writing an 8-digit number.
- Write a few numbers on the blackboard and ask them to write their number names using place value chart as shown in TB: Pg.33.
- Solve and discuss:
 - WB: Pg. 32, Q. 11, 12,
 - WB: Pg. 33, Q. 15.

Class Pulse Check

Duration: 2 min



- 1) What is the smallest 7-digit number?
- 2) What is the smallest 8-digit number?

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Important Words

Duration: 1 min

- **Today:** ten lakhs, crore

Seven-digit numbers

TL	L	T	Th	Th	H	T	O
	1	1	1	1	1	1	
	9	9	9	9	9	9	9
+							1
1	0	0	0	0	0	0	0

The largest 6-digit number is 999999. We get its successor by adding 1 to the number as shown here. The number thus formed is read as **ten lakhs**. In short, we write it as **T L**. It is the smallest 7-digit number. When we add 1 to the largest 6-digit number, we get the smallest 7-digit number. The largest 7-digit number is 9999999 which is read as ninety-nine

lakhs ninety-nine thousand nine hundred and ninety-nine.

Eight-digit numbers

We know that 9999999 is the largest 7-digit number. We get its successor by adding 1 to it as shown here.

The new number thus formed is 10000000 which is read as **one crore**. We write it in short as **C**.

When we add 1 to the largest 7-digit number, we get the smallest 8-digit number.

We shall now discuss the various methods of expressing a number.

There are two commonly used systems of numeration.

- 1) The Indian system
- 2) The International system

The Indian system

To read and write large numbers easily, we separate them into groups or periods, using commas(,). In the Indian system of numeration, the first period is the ones period. It consists of the first three digits of the number. The other periods to the left have two places each. We understand this system better by looking at the given Indian place value chart in the next page.

Crores		Lakhs		Thousands			Ones	
T C	C	T L	L	T Th	Th	H	T	O
Ten Crores 10,00,00,000	Crores 1,00,00,000	Ten Lakhs 10,00,000	Lakhs 1,00,000	Ten Thousands 10,000	Thousands 1,000	Hundreds 100	Tens 10	Ones 1

C	T L	L	T	Th	Th	H	T	O
	1	1	1	1	1	1	1	
	9	9	9	9	9	9	9	9
+								1
1	0	0	0	0	0	0	0	0

Transactional Tip(s)

Duration: 13 min



Interactive Discussion:

- Discuss keywords that learners must have come across like lakhs, crores etc. Discuss what a crore or a lakh looks like using a real-life example.
- Use the Classklap Place Value Board to show the Indian number system.
- Introduce the Indian system of numbering by showing the place value chart in the textbook.
- Write a few 9-digit numbers on the blackboard, and ask learners to find their number names by random calling.

Class Pulse Check

Duration: 1 min



- 1) How is 897878 read in the Indian system?

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From the place value chart, we infer that:

1 ten = 10 ones

1 hundred = 10 tens

1 thousand = 10 hundreds

1 ten thousand = 10 thousands

1 lakh = 10 ten thousands

1 ten lakh = 10 lakhs

1 crore = 10 ten lakhs

1 ten crore = 10 crores

Numbers having 1 to 10 digits

Number of digits	Smallest number	Greatest number
1	0	9
2	10	99
3	100	999
4	1000	9999
5	10000	99999
6	100000	999999
7	1000000	9999999
8	10000000	99999999
9	100000000	999999999
10	1000000000	9999999999

The International system

In the International system of numeration also a number is split into groups and periods. The periods are ones, thousands, millions and billions. Each period, in turn, has three places. Look at the place value chart of International system to understand better.

Billions			Millions			Thousands			Ones	
B	HM	TM	M	H Th	T Th	Th	H	T	O	
Billions 1,000,000,000	Hundred Millions 100,000,000	Ten Millions 10,000,000	Millions 1,000,000	Hundred Thousands 100,000	Ten Thousands 10,000	Thousands 1,000	Hundreds 100	Tens 10	Ones 1	

Equivalent numbers in the Indian and International systems

Number	Indian system	International system
100000	Lakh	Hundred thousand
1000000	Ten lakhs	Million
10000000	Crore	Ten millions
100000000	Ten crore	Hundred millions
1000000000	Hundred crore	Billion

Important Words

Duration: 1 min

- **Last class:** Predecessor, successor, lakhs, ten lakhs, crore
- **Today:** international, equivalent, billion, million

Transactional Tip(s)

Duration: 28 min



Interactive Discussion:

- Introduce the concept of million and billion using examples of currency, population, etc.
- Instruct learners to look at the chart of the Indian and International equivalents shown in TB: Pg. 36.
- Give an 8-digit number to learners and ask them to say its number name in Indian system to the international number system.
- Ask them to work in pairs to solve TB: Pg. 37, ♦Example 1. Make sure to guide them using hints.
- Solve and discuss:
 - WB: Pg. 32, Q. 9, 10,
 - WB: Pg. 32, Q. 13, 14.

Class Pulse Check

Duration: 1 min



- 1) What is the equivalent of 29 lakhs in the international system of numeration?

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Example 1: Separate the periods with commas and write the number names of the following in both the Indian and International systems of numeration.

a) 608964589 b) 27908621 c) 101010101

Solution:

Numbers	Indian system	International system
a) 608964589	60,89,64,589 Sixty crores eighty-nine lakhs sixty-four thousand five hundred and eighty-nine	608,964,589 Six hundred and eight million nine hundred and sixty-four thousand five hundred and eighty-nine
b) 27908621	2,79,08,621 Two crores seventy-nine lakhs eight thousand six hundred and twenty-one	27,908,621 Twenty-seven million nine hundred and eight thousand six hundred and twenty-one
c) 101010101	10,10,10,101 Ten crores ten lakhs ten thousand one hundred and one	101,010,101 One hundred and one million ten thousand one hundred and one



Application

We use the concept of place value to:

- 1) compare numbers.
- 2) arrange numbers in the ascending and descending orders.

Compare numbers

To compare large numbers, we should look at the digits in each place of the given two numbers. To make it easy, we shall follow these steps.

Step 1: Write the numbers in the place value chart of the Indian system of numeration.

Step 2: Check if the number of digits is the same.

If yes, then proceed to step 3. Else, write the number with the fewer number of digits as the smaller one.

Step 3: Compare the digits in each of the places. The number with the smallest digit in the same place of the given numbers is the smaller number.

Note: Always start comparing the digits from the extreme left.

Important Words

Duration: 1 min

- **Last class:** international, equivalent, billion, million
- **Today:** –

Transactional Tip(s)

Duration: 13 min



Guided Learning:

- Explain the step-by-step procedure to compare numbers using TB: Pg. 38, Example 2a on the blackboard.
- Demonstrate each step to be followed while comparing numbers mentioned in the Application' section.
- Solve TB: Pg. 38, Example 2b along with learners while giving instructions.
- Solve and discuss WB: Pg. 33, Q. 16.

Class Pulse Check

Duration: 1 min



- 1) Which one is greater, 789456 or 789546?

Example 2: Fill in the blanks with $>$, $<$ or $=$.

a) 2,39,48,137 _____ 1,39,48,137

b) 41,14,41,141 _____ 41,14,41,141

Solution: a) Let us write the given numbers in the place value chart as shown here.

C	T L	L	T Th	Th	H	T	O
2	3	9	4	8	1	3	7
1	3	9	4	8	1	3	7

In the crores place, $2 > 1$.

Therefore, $2,39,48,137 > 1,39,48,137$.

b) Let us write the given numbers in the place value chart as shown:

T C	C	T L	L	T Th	Th	H	T	O
4	1	1	4	4	1	1	4	1
4	1	1	4	4	1	1	4	1

As the digits in all the places are the same, the numbers are equal.

Therefore, $41,14,41,141 = 41,14,41,141$.

Arrange numbers in the ascending and descending orders

Ascending order: The arrangement of numbers from the smallest to the biggest is known as the ascending order.

Descending order: The arrangement of numbers from the biggest to the smallest is known as the descending order.

Example 3: Arrange the given numbers in the ascending and descending orders.

58348975, 14327818, 57124721, 23187542

Solution: Write the numbers in the place value chart as shown below.

C	T L	L	T Th	Th	H	T	O
5	8	3	4	8	9	7	5
1	4	3	2	7	8	1	8
5	7	1	2	4	7	2	1
2	3	1	8	7	5	4	2

In the crores place, $5 > 2 > 1$.

There are two numbers with 5 in the crores place. So, compare the ten lakh place.

Important Words

Duration: 1 min

- **Today:** ascending order, descending order

Transactional Tip(s)

Duration: 13 min



Activity Method:

- Instruct all learners to stand in a line in the increasing order of their heights one after the other, wherein the shortest will stand at the first position and the tallest in the last position.
- Discuss with the class, how everyone stood here in the ascending order of their heights which means arrangement from small to big/short to tall.
- Repeat the same activity for descending order where students will stand in decreasing order of height or descending order of height.
- Cite and discuss a few examples to compare and order 8-digit numbers. Refer to TB: Pg. 38, 39 Example 3.
- Solve and discuss WB: Pg. 34, Q. 17.

Class Pulse Check

Duration: 1 min



- 1) Which one is greater, 789456 or 789546?

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In the ten lakhs place, $8 > 7 > 4 > 3$.

Thus, $14327818 < 23187542 < 57124721 < 58348975$.

Therefore, the required ascending order is 14327818, 23187542, 57124721, 58348975.

The descending order of numbers is just the reverse of their ascending order.

Thus, $58348975 > 57124721 > 23187542 > 14327818$.

Therefore, the required descending order is 58348975, 57124721, 23187542, 14327818.

Example 4: The population of Town A is 36,15,492, and that of Town B is 36,84,947. Which town has more population?

Solution: Population of Town A = 36,15,492
Population of Town B = 36,84,947

Comparing the digits in the ten thousands place, we have
 $36,84,947 > 36,15,492$

Therefore, the population of Town B is more than that of Town A.

Example 5: The names of some countries and their populations are given. Use this information to answer the questions that follow in the Indian system of numeration.

Afghanistan: 2,91,17,000; Australia: 83,72,930;
Canada: 3,42,07,000; Egypt: 7,88,48,000

- a) What is the population of Afghanistan? Write the figure in words.
- b) What is the population of Egypt? Express the figure in words.
- c) Which country, Australia or Canada, has more population?

Solution: a) The population of Afghanistan is two crores ninety-one lakh and seventeen thousand.
b) The population of Egypt is seven crores eighty-eight lakhs and forty-eight thousand.
c) The population of Australia is 83,72,930 and that of Canada is 3,42,07,000.
As $3,42,07,000 > 83,72,930$, Canada has more population.

Important Words

Duration: 1 min

- **Last class:** ascending order, descending order
- **Today:** –

Transactional Tip(s)

Duration: 28 min



Interactive Discussion:

- Discuss the real-life application of Indian and international number systems and their significance.
- Solve and discuss:
 - TB: Pg. 39, Examples 4, 5,
 - WB: Pg. 34, Q. 19.

Class Pulse Check

Duration: 1 min



- 1) What will be the International system equivalent for 89 lakh?

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Higher Order Thinking Skills (H.O.T.S.)

Let us solve a few more examples involving large numbers.

Example 6: What is the sum of the place values of the digit 7 in the number 7,98,06,724?

Solution: The place values of 7 in 7,98,06,724 are 7 crores (7,00,00,000) and 7 hundred (700). Their sum is $7,00,00,000 + 700 = 7,00,00,700$.

Example 7: What is the difference between the place value and face value of the digit 5 in the number 2,56,00,017?

Solution: The place value of 5 in 2,56,00,017 is 50,00,000 and its face value is 5. Their difference is $50,00,000 - 5 = 49,99,995$.

Concept 3.2: Roman Numerals



Think

Pooja bought a clock, but found it difficult to read the time as she was not familiar with the numbers on it.

Have you ever seen such numbers? Do you know what those numbers are?



Recall

We have already learnt about large numbers. Let us recall the concept by writing the number names of the given numbers using the Indian system.

- a) 42,52,572 – _____
- b) 8,40,178 – _____
- c) 4,79,42,121 – _____
- d) 8,01,00,971 – _____
- e) 3,24,56,712 – _____

Apart from the Indian and the International systems of numeration, there is another system called the Roman numeral system. Let us learn about it.

Important Words

–

Transactional Tip(s)

Duration: 29 min



Practising:

- Discuss with learners the concepts learnt so far.
- Recall the steps for comparison of large numbers and their place values as taught in the previous class.
- Solve and discuss with learners:
 - TB: Pg. 40, Examples 6, 7,
 - TB: Pg. 44, Drill Time Q. 1-4,
 - WB: Pg. 35, Q. 21.

Class Pulse Check

Duration: 1 min



- 1) Which is greater, 10 million or 20 lakh?



C – Exit Assessment

	Suggested questions to test the learning objective(s)	Learning objective(s)	Number of learners who answered correctly
1	What is one more than the largest 5-digit number? What can you say about this number? (Ans. 100000; Smallest 6-digit number)	Period 1 - reading and writing 6-digit, 7-digit and 8-digit numbers	
2	Find the sum of the successor and predecessor of 10005? (Ans. 20010)	Period 2 - reading and writing 6-digit, 7-digit and 8-digit numbers	
3	Write 'Seventy crore sixty-six lakh forty-four thousand five hundred and eighty-eight' in number form. (Ans. 70, 66, 44, 588)	Period 3 - the Indian and the International systems of numeration	
4	In which system of numeration is 39160745—written as 'thirty-nine million one hundred sixty thousand seven hundred forty-five'? (Ans. International system)	Period 3 - the Indian and the International systems of numeration	
5	To compare a 6-digit number with a 5-digit number, which rule will you follow? (Ans. Smaller number has lesser number of digits)	Period 4 - comparing and ordering numbers	
6	Which two digits should you compare to find the larger number between 8390687 and 8391687? (Ans. 0 and 1)	Period 4 - comparing and ordering numbers	
7	Form the greatest number using 2, 0, 8, 6, 9, 7, 3. (Ans. 9876320)	Period 5 - reading and writing 6-digit, 7-digit and 8-digit numbers	
8	Calculate the sum of the place values of 6 in 6392600. (Ans. 600600)	Period 6 - reading and writing 6-digit, 7-digit and 8-digit numbers	

Post-lesson Reflection			
TB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	WB completed
	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Enthusiastic participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Concept clarity in the classroom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Concept clarity through the workbook	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Handhold Learners	Challenge Learners
Names		
Exam Revision Strategy	Reteach <input type="checkbox"/> Revise <input type="checkbox"/>	Practise <input type="checkbox"/>
App Report	Number _____	Signature _____

A – Curriculum to Learning Objectives: Numbers

Prior Knowledge		• Number sense, skip counting, place value system				
Class	Ch. No.	Chapter Name	C. No.	Concept Name	L. Obj. No.	Learning Objectives
1	3	Numbers	3.1	Count in Ones and Tens	3.1.a	• the concept of zero
					3.1.b	• the sequence of numbers up to 99
					3.1.c	• place value and face value of numbers
					3.1.d	• writing number names
			3.2	Compare 2-digit Numbers	3.2.a	• comparing, ordering and forming numbers
2	3	Numbers	3.1	Count by Hundreds	3.1.a	• reading and writing numerals and number names up to 999
					3.1.b	• represent 3-digit numbers on an abacus
					3.1.c	• place values, face values and expanded forms of numbers
			3.3	Compare 3-digit Numbers	3.3.a	• comparing two numbers
					3.3.b	• ascending and descending orders
3	3	Numbers	3.1	Count by Thousands	3.1.a	• writing 4-digit numbers with place value chart
					3.1.b	• writing the standard and the expanded forms of the number
			3.2	Compare 4-digit Numbers	3.2.a	• comparing and ordering numbers
					3.2.b	• identifying and forming the greatest and the smallest number
4	3	Numbers	3.1	Count by Ten Thousands	3.1.a	• smallest and largest 4-digit and 5-digit numbers.
					3.1.b	• reading and writing 5-digit numbers
					3.1.c	• finding the place value and the face value of the numbers
			3.2	Compare and Order 5-digit Numbers	3.2.a	• reading and writing 5-digit numbers
					3.2.b	• comparing and ordering 5-digit numbers
					3.2.c	• finding the place value and the face value of the numbers
					3.2.d	• forming the largest and the smallest 5-digit numbers
5	3	Large Numbers	3.1	Indian and International Systems of Numeration	3.1.a	• reading and writing 6-digit, 7-digit and 8-digit numbers
					3.1.b	• the Indian and the International systems of numeration
					3.1.c	• comparing and ordering numbers
			3.2	Roman Numerals	3.2.a	• Roman and Hindu-Arabic numerals

B – Vision-to-Action Plan: 3.2 Roman Numerals

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
1 DD/MM/YYYY	40 – THK, RCL	3.2.a	<ul style="list-style-type: none"> Recall Roman numbers from 1-40. 	<ul style="list-style-type: none"> Questioning 	–	WB: Pg. 36 (Q. 1)	WB: Pg. 36 (Q. 2, 3)	
2 DD/MM/YYYY	41 – REM/UND	3.2.a	<ul style="list-style-type: none"> Read and write Roman numbers greater than 40. Understand and remember Roman symbols up to 1000. 	<ul style="list-style-type: none"> Direct Instruction 	–	WB: Pgs. 36, 37 (Q. 4-6) WB: Pg. 37 (Q. 10-12)	WB: Pg. 37 (Q. 7-9)	
3 DD/MM/YYYY	42 – REM/UND	3.2.a	<ul style="list-style-type: none"> Understand and apply rules of conversion for reading and writing in Roman numerals. 	<ul style="list-style-type: none"> Guided Learning 	–	TB: Pg. 42 (Example 8, 9, 10) WB: Pg. 37 (Q. 13, 15)	WB: Pgs. 37, 38 (Q. 14, 16)	
4 DD/MM/YYYY	42, 43 – APP	3.2.a	<ul style="list-style-type: none"> Practice conversion of large Roman numbers to Hindu - Arabic numerals and vice-versa. 	<ul style="list-style-type: none"> Practising 	–	TB: Pg. 43 (Examples 12, 13) WB: Pg. 38 (Q. 17-19)	WB: Pg. 39 (Q. 20)	
5 DD/MM/YYYY	43, 44 – HOTS, Drill Time	3.2.a	<ul style="list-style-type: none"> Understand and remember Roman symbols greater than 1000. 	<ul style="list-style-type: none"> Peer Learning 	<ul style="list-style-type: none"> Materials for Roman numeral chart 	TB: Pg. 43 (Example 14 and 15) TB: Pg. 44 (Drill Time Q. 5-7) WB: Pgs. 39, 40 (Q. 21, 22)	–	

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Higher Order Thinking Skills (H.O.T.S.)

Let us solve a few more examples involving large numbers.

Example 6: What is the sum of the place values of the digit 7 in the number 7,98,06,724?

Solution: The place values of 7 in 7,98,06,724 are 7 crores (7,00,00,000) and 7 hundred (700). Their sum is $7,00,00,000 + 700 = 7,00,00,700$.

Example 7: What is the difference between the place value and face value of the digit 5 in the number 2,56,00,017?

Solution: The place value of 5 in 2,56,00,017 is 50,00,000 and its face value is 5. Their difference is $50,00,000 - 5 = 49,99,995$.

Concept 3.2: Roman Numerals



Think

Pooja bought a clock, but found it difficult to read the time as she was not familiar with the numbers on it.

Have you ever seen such numbers? Do you know what those numbers are?



Recall

We have already learnt about large numbers. Let us recall the concept by writing the number names of the given numbers using the Indian system.

- a) 42,52,572 – _____
- b) 8,40,178 – _____
- c) 4,79,42,121 – _____
- d) 8,01,00,971 – _____
- e) 3,24,56,712 – _____

Apart from the Indian and the International systems of numeration, there is another system called the Roman numeral system. Let us learn about it.

Important Words

Duration: 1 min

- **Today:** roman numerals

Transactional Tip(s)

Duration: 28 min



Questioning:

- Ask learners to write their date of birth (date and month) in Roman numbers and their partners will cross check the answers.
- Recall a few Roman numerals and their respective Hindu- Arabic numerals via randomly calling and asking the learners.
- Solve and discuss TB: Pg. 40, 'Recall' section, a-e.
- Solve and discuss WB: Pg. 36, Q.1.

Class Pulse Check

Duration: 1 min



- 1) The Roman number for 39 ____.

Annual Day:
24/61

Day:
2/5

Actual Date:

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Remembering and Understanding

The numerals that we use in our day-to-day life are 1, 2, 3... These numbers are called the **Hindu-Arabic numerals** as they were developed in ancient India. They were spread to the other parts of the world by Arab traders.

The Roman numerals were used in ancient Rome. It has seven letters of English with the help of which all other numbers are written.

The Roman numeral system was followed in ancient Rome. Nowadays, Roman numerals are mainly used because of their historical importance.

The Roman numbers are - I, V, X, L, C, D and M.

The following table shows the Roman numerals with their values in the Hindu-Arabic.

Roman numerals	I	II	III	IV	V	VI	VII	VIII	IX	X
Hindu-Arabic numerals	1	2	3	4	5	6	7	8	9	10

Roman numerals (symbols)	I	V	X	L	C	D	M
Hindu-Arabic numerals (values)	1	5	10	50	100	500	1000

We follow certain rules to read and write numerals in the Roman system.

Rule	Description	Examples
1)	A symbol can be repeated to a maximum of three times. Repetition of numbers means addition. Only I, X, C and M can be repeated.	$II = 1 + 1 = 2$ $XX = 10 + 10 = 20$ $CCC = 100 + 100 + 100 = 300$
2)	If a symbol of lower value is placed after the symbol of a greater value, the values are added.	$XV = 10 + 5 = 15$ $LXXX = 50 + 10 + 10 + 10 = 80$ $MCC = 1000 + 100 + 100 = 1200$
3)	If a symbol of lower value is placed before the symbol of a greater value, the smaller value is subtracted from the greater one.	$IV = 4 (5 - 1)$ $IX = 9 (10 - 1)$ $XC = 90 (100 - 10)$
4)	I can be subtracted from V and X only. X can be subtracted from L and C only. C can be subtracted from D and M only.	$IV = 4, IX = 9$ $XL = 40, XC = 90$ $CD = 400, CM = 900$

Important Words

Duration: 1 min

- **Last class:** roman numerals
- **Today:** Hindu-Arabic numerals

Transactional Tip(s)

Duration: 28 min



Direct Instruction:

- Instruct learners to remember the Roman symbols for 50, 100, 500 and 1000 and drawing a similar table shown in TB: Pg. 41 in the blackboard.
- Explain how numbers more than 50, 100, 500 and 1000 can be written.
- Explain which symbols can be repeated and which cannot, by writing examples on the blackboard. Example: L = 50; if we write LL for 100 since $50 + 50 = 100$. This is an incorrect way of representation. As, 100 has a symbol designated as C.
- Similarly, explain why V and D are never repeated.
- Solve and discuss:
 - WB: Pgs. 36, 37, Q. 4-6,
 - WB: Pg. 37, Q. 10-12.

Class Pulse Check

Duration: 1 min



- 1) How will you write 672 and 99 in Roman numerals?

Annual Day:
25/61

Day:
3/5

Actual Date:

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Example 8: Write the Hindu-Arabic numerals for the given Roman numerals.

a) CLXIX b) LXXVII c) DCL

Solution:

a) $CLXIX = 100 + 50 + 10 + (10 - 1) = 169$

b) $LXXVII = 50 + 10 + 10 + 5 + 1 + 1 = 77$

c) $DCL = 500 + 100 + 50 = 650$

Example 9: Write the Roman numerals for the given numbers.

a) 160 b) 2950 c) 14

Solution:

a) $160 = 100 + 50 + 10 = CLX$

b) $2950 = 1000 + 1000 + (1000 - 100) + 50 = MMCML$

c) $14 = 10 + (5 - 1) = XIV$

Example 10: Write the Roman numerals from 50 to 100 counting by 10s.

Solution:

Counting by 10s, we get 50, 60, 70, 80, 90 and 100.

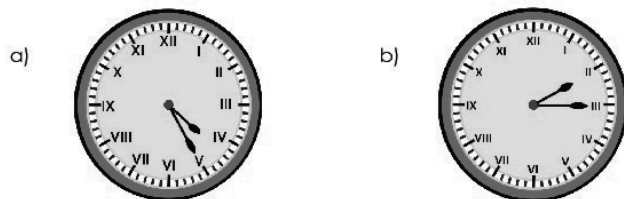
Roman numerals for these numbers are: L, LX, LXX, LXXX, XC and C respectively.



Application

Let us see a few real-life examples where we apply the knowledge of Roman numerals.

Example 11: Read the following clocks and write the time they are showing using Hindu-Arabic numbers.



Solution:

a) The short (hour) hand has crossed IV. The Hindu-Arabic numeral for IV is 4.
The long (minute) hand is on 'V' which is 5. So, it shows 25 minutes.
Therefore, the time is 4:25.

b) The short (hour) hand is at 'II'. The Hindu-Arabic numeral for II is 2.
The long (minute) hand is on 'III' which is 3. So, it shows 15 minutes.
Therefore, the time is 2:15.

Important Words

- **Last class:** Hindu-Arabic numerals
- **Today:** –

Transactional Tip(s)

Duration: 28 min



Guided Learning:

- Describe each rule regarding the repetition of Roman symbols on the blackboard, with the examples given on TB: Pg. 42, Examples 8-10.
- Assign learners WB: Pg. 37, Q. 13, 15 and ask learners to solve them independently and assist the learners if and when required.
- Solve and discuss the solution with learners.

Class Pulse Check

Duration: 1 min



- 1) What will be the Roman number for 78?
- 2) What will be the Roman number for 672 and 99?

Annual Day:
26/61

Day:
4/5

Actual Date:

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Example 12: Rohit scores MDCLV marks in the first semester and MDCVIII marks in the second semester. Express Rohan's total marks as Hindu-Arabic numerals.

Solution: Rohit's score in the first semester = MDCLV
His score in the second semester = MDCVIII
Hindu-Arabic numerals for the total marks are:
 $MDCLV = 1000 + 500 + 100 + 50 + 5 = 1655$
 $MDCVIII = 1000 + 500 + 100 + 5 + 1 + 1 + 1 = 1608$
 $MDCLV + MDCVIII = 1655 + 1608 = 3263$
Therefore, Rohit scored a total of 3263 marks.

Example 13: List out some real-life situations where Roman numerals are used.

Solution: Some real-life situations where Roman numerals are used are:
a) on wall clocks
b) representation of classroom numbers. For example, Class IV-A, Class V-B and so on.
c) section numbers in exam question papers
d) chapter numbers in novels
e) after people's names. For example - John II and so on (used in Western countries very often).



Higher Order Thinking Skills (H.O.T.S.)

Consider the following examples based on large Roman numerals.

Example 14: What is the Hindu-Arabic numeral for MDCLXVI?

Solution: $MDCLXVI = 1000 + 500 + 100 + 50 + 10 + 5 + 1 = 1666$

Example 15: Which is the larger number between MDCLXXIV and MDCCLXXIX?

Solution: $MDCLXXIV = 1000 + 500 + 100 + 50 + 10 + 10 + (5 - 1) = 1674$
 $MDCCLXXIX = 1000 + 500 + 100 + 100 + 50 + 10 + 10 + (10 - 1) = 1779$
 $1779 > 1674$. Thus, MDCCLXXIX is the larger number.

Important Words

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Transactional Tip(s)

Duration: 28 min



Practising:

- Create a table for Hindu-Arabic to Roman numeral and write the Roman number for all the numbers beginning from 1 to 1000.
- Discuss TB: Pg. 42, 43, Examples 11-13 in the class by recalling the step by step procedure of converting the Roman numerals to Hindu-Arabic numerals.
- Solve and discuss WB: Pg. 38, Q. 17-19.

Class Pulse Check

Duration: 2 min



- 1) Give the Hindu-Arabic numeral for MDCXIV.
- 2) How will you write the year 2019 in Roman numerals?

Annual Day:
27/61

Day:
5/5

Actual Date:

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Drill Time

Concept 3.1: Indian and International Systems of Numeration

1) Write the successor and the predecessor of the following numbers.

- a) 62591 b) 59104 c) 18503 d) 70001 e) 28501

2) Separate the periods with commas and write the number names of the following in the Indian and International systems of numeration.

- a) 872492853 b) 658392759 c) 124654368 d) 765401954 e) 378954726

3) Fill in the blanks with >, < or =.

- a) 4,34,12,456 _____ 4,34,21,456 b) 2,31,98,896 _____ 6,87,98,541
c) 7,97,43,111 _____ 6,12,41,845 d) 1,67,91,941 _____ 1,76,19,149

4) Arrange the numbers in the ascending and descending orders.

- a) 85714781, 57294769, 18372657 b) 17485729, 91845726, 75638462
c) 38593010, 75639205, 75927592 d) 10101010, 11010101, 10010101

Concept 3.2: Roman Numerals

5) Write the following in Roman numerals.

- a) 983 b) 804 c) 1481 d) 294 e) 1000

6) Write the following in the Hindu-Arabic numerals:

- a) CLXX b) LXVII c) DL d) MCML e) LXIX

7) Word problems

- a) A train travelled MDCVII km on day one. The same train travelled MDCLV km on day two. On which day did the train travel farther?
b) In a car race, Neha scores LXVI points and Raju scores XXV points. Who wins the race?

Important Words

–

Transactional Tip(s)

Duration: 30 min



Peer Learning - Pair/Group:

- Make pairs and instruct learners to solve TB: Pg. 43 Examples 14, 15 and discuss the solutions using roman numeral chart
- Solve and discuss TB: Pg. 44, 'Drill Time', Q. 5-7.
- Solve and discuss WB: Pgs. 39, 40, Q. 21, 22.

Class Pulse Check



1) -



C – Exit Assessment

	Suggested questions to test the learning objective(s)	Learning objective(s)	Number of learners who answered correctly
1	Circle the incorrect notation. A) XXIII B) XXIIIX C) XXIX D) XXXIV (Ans. B)	Period 2 - Roman and Hindu-Arabic numerals	
2	Write the Hindu- Arabic equivalent of LIX. (Ans. 59)	Period 1 - Roman and Hindu-Arabic numerals	
3	Complete the pattern: C, CXX, CXXX, CXL, CL, _____. (Ans. CLX)	Period 2 - Roman and Hindu-Arabic numerals	
4	How is 2999 expressed in Roman numerals? (Ans. MMCMXCIX)	Period 5 - Roman and Hindu-Arabic numerals	
5	Express MCMXLVII in Hindu-Arabic numerals. (Ans. 1947)	Period 3 - Roman and Hindu-Arabic numerals	
6	How is 70750 written in Roman numerals? (Ans. LXXDCCL)	Period 4 - Roman and Hindu-Arabic numerals	

Post-lesson Reflection			
TB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	WB completed
	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Enthusiastic participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Concept clarity in the classroom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Concept clarity through the workbook	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Handhold Learners	Challenge Learners
Names		
Exam Revision Strategy	Reteach <input type="checkbox"/> Revise <input type="checkbox"/> Practise <input type="checkbox"/>	
App Report	Number _____	Signature _____

Teacher Reference: Textbook

Chapter 3: Large Numbers

Concept 3.1: Indian and International Systems of Numeration

Drill Time

- 1) Write the successor and the predecessor of the following numbers.

Number	Successor	Predecessor
a) 62591	62592	62590
b) 59104	59105	59103
c) 18503	18504	18502
d) 70001	70002	70000
e) 28501	28502	28500

- 2) Separate the periods with commas and write the number names of the following in the Indian and International systems of numeration.

Number	Indian system	International system
a) 872492853	eighty-seven crore twenty-four lakh ninety-two thousand eight hundred fifty-three 87,24,92,853	eight hundred seventy-two million four hundred ninety-two thousand eight hundred fifty-three 872,492,853
b) 658392759	sixty-five crore eighty-three lakh ninety-two thousand seven hundred fifty-nine 65,83,92,759	six hundred fifty-eight million three hundred ninety-two thousand seven hundred fifty-nine 658,392,759
c) 124654368	twelve crore forty-six lakh fifty-four thousand three hundred sixty-eight 12,46,54,368	one hundred twenty-four million six hundred fifty-four thousand three hundred sixty-eight 124,654,368

Teacher Reference: Textbook

Number	Indian system	International system
d) 765401954	76,54,01,954 seventy-six crore fifty-four lakh one thousand nine hundred fifty-four	765,401,954 seven hundred sixty-five million four hundred one thousand nine hundred fifty-four
e) 378954726	37,89,54,726 thirty-seven crore eighty-nine lakh fifty-four thousand seven hundred twenty-six	378,954,726 three hundred seventy-eight million nine hundred fifty-four thousand seven hundred twenty-six

3) Fill in the blanks with $>$, $<$ or $=$.

- a) 4,34,12,456 \leq 4,34,21,456
 b) 2,31,98,896 \leq 6,87,98,541
 c) 7,97,43,111 $>$ 6,12,41,845
 d) 1,67,91,941 \leq 1,76,19,149

4) Arrange the numbers in the ascending and descending orders.

	Numbers	Ascending Order	Descending Order
a)	85714781, 57294769, 18372657	18372657 < 57294769 < 85714781	85714781 > 57294769 > 18372657
b)	17485729, 91845726, 75638462	17485729 < 75638462 < 91845726	91845726 > 75638462 > 17485729
c)	38593010, 75639205, 75927592	38593010 < 75639205 < 75927592	75927592 > 75639205 > 38593010
d)	10101010, 11010101, 10010101	10010101 < 10101010 < 11010101	11010101 > 10101010 > 10010101

Teacher Reference: Textbook

Chapter 3: Large Numbers

Concept 3.2: Roman Numerals

Drill Time

- 5) Write the following in Roman numerals.
- a) 983 = **CMLXXXIII** b) 804 = **DCCCIV** c) 1481 = **MCDLXXXI**
- d) 294 = **CCXCIV** e) 1000 = **M**
- 6) Write the following in the Hindu-Arabic numerals:
- a) CLXX = **170** b) LXVII = **67** c) DL = **550**
- d) MCM = **1950** e) LXIX = **69**
- 7) Word problems
- a) A train travelled MDCVIII km on day one. The same train travelled MDCLV km on day two. On which day did the train travel farther?
- b) In a car race, Neha scores LXVI points and Raju scores XXV points. Who wins the race?

Solution: a) MMMCCLXIII

b) Neha



Large Numbers

Concept 3.1: Indian and International Systems of Numeration



Recall

Multiple Choice Questions

- 1) The number name of 55,582 in the Indian system is _____. [A]
(A) fifty-five thousand five hundred and eighty-two
(B) fifty-four thousand five hundred and eighty-two
(C) fifty-five thousand five hundred and fifty-two
(D) fifty-five thousand five hundred and eighty-three
- 2) The successor of 90000 is _____. [A]
(A) 90001 (B) 90002 (C) 89999 (D) 89998
- 3) The digit in the hundreds place of 14568 is _____. [B]
(A) 8 (B) 5 (C) 1 (D) 6



Remembering and Understanding

Multiple Choice Questions

- 4) 1 lakh = _____. [B]
(A) 10 hundreds (B) 100 thousands (C) 10 ones (D) 10 hundreds
- 5) The greatest 6-digit number is _____. [D]
(A) 99999 (B) 100000 (C) 9999999 (D) 999999
- 6) The predecessor of 700000 is _____. [C]
(A) 700002 (B) 699998 (C) 699999 (D) 700001

Fill in the Blanks

- 7) The numeral for one lakh twenty-five thousand one hundred and twenty-three is 1,25,123.
- 8) The number name of 25,30,223 is twenty-five lakh thirty thousand two hundred and twenty-three.
- 9) In the International system of numeration, all the periods have three places each.

Very Short Answer Questions

- 10) How many lakhs equal 1 million?
Solution: 10 lakhs
- 11) Write the numeral for one crore six lakh forty thousand six hundred and fifty-one.
Solution: 1,06,40,651
- 12) Write the predecessor and successor of 720001.
Solution: Predecessor = 720000, Successor = 720002

Short Answer Questions

- 13) In 3908623, separate the periods using commas in the Indian and International systems.
 Write the number names in the Indian and the International systems of numeration.

Solution:

Number	Numeral with Commas	Name
3908623	39,08,623	Thirty-nine lakh eight thousand six hundred and twenty-three
	3,908,623	Three million nine hundred and eight thousand six hundred and twenty-three

- 14) In 4105625, separate the periods using commas in the Indian and International systems.
 Write the number names in the Indian and International systems of numeration.

Solution:

Number	Numeral with Commas	Name
4105625	41,05,625	Forty-one lakh five thousand six hundred and twenty-five
	4,105,625	Four million one hundred and five thousand six hundred and twenty-five

Long Answer Questions

- 15) Write the following numbers in the place value chart according to the Indian system of numeration.
- a) two crore thirteen lakh sixty-nine thousand and one
 - b) thirteen lakh sixty-seven thousand two hundred and fifteen
 - c) three crore forty-seven lakh eighteen thousand two hundred and three
 - d) five crore sixty-one lakh thirty-three thousand three hundred and fifty-seven

Solution:

	Crores	Ten Lakhs	Lakhs	Ten Thousands	Thousands	Hundreds	Tens	Ones
a)	2	1	3	6	9	0	0	1
b)		1	3	6	7	2	1	5
c)	3	4	7	1	8	2	0	3
d)	5	6	1	3	3	3	5	7

- 16) Write the following numbers in the place value chart according to the International system of numeration.

- a) forty million three hundred sixty-nine thousand two hundred and forty-one
- b) nine hundred forty-seven thousand two hundred and seventeen
- c) six million seven hundred eighteen thousand three hundred and one
- d) eight hundred twenty-one thousand three hundred and fifty-nine

Solution:

	Ten Millions	Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
a)	4	0	3	6	9	2	4	1
b)			9	4	7	2	1	7
c)		6	7	1	8	3	0	1
d)			8	2	1	3	5	9



Short Answer Questions

- 17) Compare 92395678 and 5487324.

Solution: Let us write the given numbers in the place value chart

C	TL	L	T	Th	H	T	O
9	2	3	9	5	6	7	8
	5	4	8	7	3	2	4

The number of digits in 92395678 is more than the number of digits in 5487324.

So, $92395678 > 5487324$.

- 18) Compare 3786456 and 301327.

Solution: Let us write the given numbers in the place value chart

TL	L	T	Th	H	T	O
3	7	8	6	4	5	6
	3	0	1	3	2	7

The number of digits in 3786456 is more than the number of digits in 301327.

So, $3786456 > 301327$.

Long Answer Questions

- 19) Arrange the given numbers in ascending and descending order: 98348597, 24327817, 97124127, 13187524.

Solution: Write the numbers in the place value chart as shown below

C	TL	L	T	Th	H	T	O
9	8	3	4	8	5	9	7
2	4	3	2	7	8	1	7
9	7	1	2	4	1	2	7
1	3	1	8	7	5	2	4

In the crores place, $9 > 2 > 1$ and in the ten lakhs place, $8 > 7 > 4 > 3$.

So, $13187524 < 24327817 < 97124127 < 98348597$
 Thus, the required ascending order is $13187524 < 24327817 < 97124127 < 98348597$
 and the required descending order is $98348597 > 97124127 > 24327817 > 13187524$

20) The names of a few countries and their populations are given below. Use this information to answer the questions that follow.

France: 65447374, Iceland: 317900, Iran: 75078000, Italy: 60340328

a) What is the population of France? Write the number in words.

b) What is the population of Italy? Write the number in words.

c) Which of the countries, Iceland or Iran, has a larger population?

Solution: a) The population of France is 65447374. In words, it is six crore fifty-four lakh forty-seven thousand three hundred and seventy-four.....
 b) The population of Italy is 60340328. In words, it is six crore three lakh forty thousand three hundred and twenty-eight.....
 c) The population of Iceland is 317900 and that of Iran is 75078000.....
 As $75078000 > 317900$, Iran has more population.....



Higher Order Thinking Skills (H.O.T.S.)

Short Answer Question

21) Find the place values and face values of the underlined digits in the given numbers.

a) 9800234 b) 4123059

Solution: a) Face value = 9; Place value = 9000000.....
 b) Face value = 1; Place value = 100000.....

Long Answer Question

- 22) What is the difference between the place value and face value of the digit 6 in the number 16700925? Subtract face value from place value.

Solution: The place value of 6 in 16700925 is 6000000.
The face value of 6 is 6.
Their difference is $6000000 - 6 = 5999994$.
.....

Concept 3.2: Roman Numerals



Recall

Multiple Choice Questions

- 1) The number name of 55,05,820 in the Indian system of numeration is _____. [D]
(A) fifty-five thousand five hundred and eighty-two
(B) five lakhs five thousand five hundred and eighty-two
(C) five lakhs fifty thousand eight hundred and twenty
(D) fifty-five lakhs five thousand eight hundred and twenty
- 2) The numeral for one lakh twenty-five thousand one hundred and twenty-three is _____. [A]
(A) 1,25,123 (B) 12,512 (C) 10,25,123 (D) 1,25,132
- 3) The numeral for ten lakh thirty-three thousand one hundred and twenty-four is _____. [D]
(A) 10,33,142 (B) 10,124 (C) 1,33,124 (D) 10,33,124



Remembering and Understanding

Multiple Choice Questions

- 4) The Hindu-Arabic numeral for D is _____. [A]
(A) 500 (B) 400 (C) 1000 (D) 100

- 5) The Hindu-Arabic numeral for M is _____. [C]
 (A) 500 (B) 400 (C) 1000 (D) 100
- 6) The Roman numeral for 4 is _____. [C]
 (A) V (B) VI (C) IV (D) IIII

Fill in the Blanks

- 7) The Roman numeral for 9 is **IX** _____.
- 8) The Hindu-Arabic numeral for XXI is **21** _____.
- 9) The Roman numeral for 5 is **V** _____.

Very Short Answer Questions

- 10) Which Roman numerals are never repeated?

Solution: V, L and D

- 11) Which Roman numerals can be repeated?

Solution: I, X, C and M

- 12) What is the Roman numeral for 20?

Solution: XX

Short Answer Questions

- 13) Write the Hindu-Arabic numeral for CLXVI.

Solution: $CLXVI = 100 + 50 + 10 + (5 + 1)$
 = 166

So, the Hindu-Arabic numeral for CLXVI is 166.

- 14) Write the Roman numeral for 172.

Solution: $172 = 100 + 50 + 10 + 10 + 1 + 1$
 = CLXXII

Long Answer Questions

- 15) Write the Hindu-Arabic numerals for the following:

a) DCL b) CLXI c) MDLXVI d) MDCC

Solution: a) $DCL = 500 + 100 + 50 = 650$
 b) $CLXI = 100 + 50 + 10 + 1 = 161$

c) $MDLXVI = 1000 + 500 + 50 + 10 + (5 + 1) = 1566$
 d) $MDCC = 1000 + 500 + 100 + 100 = 1700$

16) Write the Roman numerals for the following:

- a) 181 b) 555 c) 1578 d) 99

Solution: a) $181 = 100 + 50 + 10 + 10 + 10 + 10 + 1 = CLXXXI$
 b) $555 = 500 + 50 + 5 = DLV$
 c) $1578 = 1000 + 500 + 50 + 10 + 10 + 5 + 1 + 1 + 1 = MDLXXVIII$
 d) $99 = (100 - 10) + (10 - 1) = XCIX$

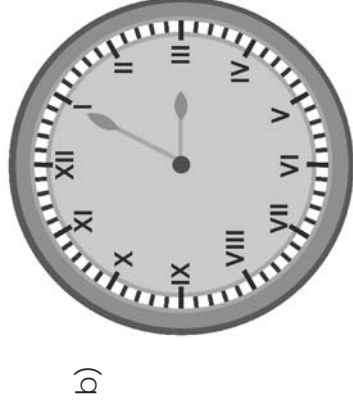
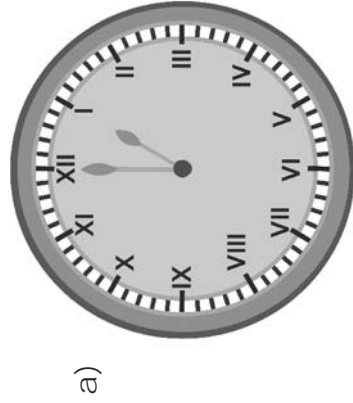


Application

Short Answer Questions

17) In a car race, Mollie scores LXXVI points and Shahid scores XXXV points. Who wins the race?
Solution: Points scored by Mollie = $LXXVI = 50 + 10 + 10 + 5 + 1 = 76$
 Points scored by Shahid = $XXXV = 10 + 10 + 10 + 5 = 35$
 As $76 > 35$, Mollie wins the race.

18) Look at the clock given and write the time using Hindu-Arabic numerals.



Solution: a) The time is 1:00.
 b) The time is 3:05.

Long Answer Questions

- 19) Arrange the given Roman numerals in ascending order.

CCCXX, MDV, MLXV, CCLXIX

Solution: $CCCXX = 100 + 100 + 100 + 10 + 10 = 320$
 $MDV = 1000 + 500 + 5 = 1505$
 $MLXV = 1000 + 50 + 10 + 5 = 1065$
 $CCLXIX = 100 + 100 + 50 + 10 + (10 - 1) = 269$
 Thus, $269 < 320 < 1065 < 1505$
 Therefore, the required ascending order is $CCLXIX < CCCXX < MLXV < MDV$.

- 20) Vaidika scores MCL marks in the first semester and MDXX marks in the second semester. Express Vaidika's total marks in Hindu-Arabic numerals.

Solution: Vaidika's score in the first semester = MCL
 Her score in the second semester = MDXX
 $MCL = 1000 + 100 + 50 = 1150$
 $MDXX = 1000 + 500 + 10 + 10 = 1520$
 $MCL + MDXX = 1150 + 1520 = 2670$
 So, Vaidika scored a total of 2670 marks.



Higher Order Thinking Skills (H.O.T.S.)

Short Answer Question

- 21) Add MCXV and DCVII.

Solution: $MCXV = 1000 + 100 + 10 + 5 = 1115$
 $DCVII = 500 + 100 + 5 + 1 + 1 = 607$
 $1115 + 607 = 1722$

Long Answer Question

22) Which is larger: MDCLXV or MDCCLXIX?

Solution: MDCLXV = 1000 + 500 + 100 + 50 + 10 + 5 = 1665

MDCCLXIX = 1000 + 500 + 100 + 100 + 50 + 10 + (10 - 1) = 1769

1769 > 1665. Thus, MDCCLXIX is larger.

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Practice Questions

- 1) What is the successor of 47892?
- 2) What is the Roman numeral of 1902?
- 3) What is the sum of the digits in the thousands and crores places in 19022376?
- 4) What is the Roman numeral of 37?
- 5) Which is the number in the 'millions' place in 90,103,191?
- 6) Is the number 4,098,204,921 written in the Indian or international system? Write its number name.
- 7) Which of the given numbers is greater?

Five crore twenty-three lakh ten thousand nine hundred and three or

Five billion two hundred and thirty-one million ninety thousand three hundred and one
- 8) There are three lakh fifty-nine thousand four hundred and thirty-two students in City A. City B has three lakh fifty-five thousand four hundred and thirty students. Which city has fewer students?
- 9) Ali weighs 51 kg while Akshay weighs 35 kg. Express their weights in Roman numerals.
- 10) What is the sum of the digits in the ten millions and billions places in 8817531409?
- 11) What is the Hindu-Arabic numeral of MCMXCIX?
- 12) What is the predecessor of 9879?

- 13) What is the Hindu-Arabic numeral of CXLIV?
- 14) How will you write six crore four lakh twenty-nine thousand seven hundred and thirty-two?
- 15) Neena found the following numbers written on a paper. She wants to arrange the numbers in ascending and descending order. Can you help her do that?
- nine crore ninety-nine lakh ninety thousand and ninety-one
- nine crore ninety-nine lakh nine thousand nine hundred and one
- ninety-nine million nine hundred and ninety-nine thousand and ninety-one
- ninety-nine million nine hundred and nine thousand and one

Teacher Reference: Workbook

Chapter 3: Large Numbers



Practice Questions

- 1) 47893
- 2) MCMIII
- 3) 3
- 4) XXXVII
- 5) 0
- 6) International system, four billion ninety-eight million two hundred and four thousand and nine hundred and twenty-one
- 7) Five billion two hundred and thirty-one million ninety thousand three hundred and one
- 8) City B
- 9) Ali = LI, Akshay = XXXV
- 10) 9
- 11) 1999
- 12) 9878
- 13) 144
- 14) 6,04,29,732
- 15) Ascending order: ninety-nine million nine hundred and nine thousand and one, nine crore ninety-nine lakh nine thousand nine hundred and one, nine crore ninety nine lakh ninety thousand and ninety-one, ninety nine million nine hundred and ninety-nine thousand and ninety-one
Descending order: ninety-nine million nine hundred and ninety-nine thousand and ninety- one, nine crore ninety-nine lakh ninety thousand and ninety-one, nine crore ninety-nine lakh nine thousand nine hundred and one, ninety-nine million nine hundred and nine thousand and one

A – Curriculum to Learning Objectives: Addition and Subtraction

Prior Knowledge		• <i>Number sense, addition, subtraction, place value system, counting</i>				
Class	Ch. No.	Chapter Name	C. No.	Concept Name	L. Obj. No.	Learning Objectives
1	4	Addition	4.1	Add 1-digit Numbers and 2-digit Numbers	4.1.a	• adding numbers up to 99 without regrouping
					4.1.b	• different methods of adding numbers
			4.2	Add two 1-digit Numbers Mentally	4.2.a	• adding two 1-digit numbers mentally
2	4	Addition	4.1	Add 2-digit and 3-digit Numbers	4.1.a	• adding 2-digit and 3-digit numbers
					4.1.b	• properties of addition
3	4	Addition	4.1	Estimate the Sum of Two Numbers	4.1.a	• rounding off numbers to the nearest tens
					4.1.b	• estimate the sum of 2-digit and 3-digit numbers
			4.2	Add 3-digit and 4-digit Numbers	4.2.a	• adding 3-digit and 4-digit numbers with and without regrouping
			4.3	Add 2-digit Numbers Mentally	4.3.a	• adding 2-digit numbers mentally
4	4	Addition and Subtraction	4.1	Add and Subtract 5-digit Numbers	4.1.a	• adding and subtracting 5-digit numbers
					4.1.b	• applying addition and subtraction operations in real-life situations
5	4	Addition and Subtraction	4.1	Add and Subtract Large Numbers	4.1.a	• adding and subtracting large numbers
					4.1.b	• column addition and subtraction of numbers
					4.1.c	• adding and subtracting large numbers in real life

B – Vision-to-Action Plan: 4.1 Add and Subtract Large Numbers

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
1 DD/MM/YYYY	45 – THK, RCL	4.1.a	<ul style="list-style-type: none"> Add and subtract large numbers. 	<ul style="list-style-type: none"> Practising 	–	WB: Pg. 42 (Q. 4-6)	WB: Pg. 42 (Q. 1-3)	
2 DD/MM/YYYY	46, 47 – REM/UND	4.1.a, 4.1.b	<ul style="list-style-type: none"> Illustrate the addition and subtraction of large numbers using the vertical or column method. 	<ul style="list-style-type: none"> Guided Learning Practising 	–	TB: Pg. 46, 47 (Examples 1 – 3) WB: Pg. 42 (Q. 7-9) WB: Pg. 43 (Q. 14, 15)	WB: Pg. 43 (Q. 10-13) WB: Pg. 44 (Q. 16)	
3 DD/MM/YYYY	48, 49 – APP, HOTS, Drill Time	4.1.b, 4.1.c	<ul style="list-style-type: none"> Practice addition and subtraction of large numbers with real-life examples. 	<ul style="list-style-type: none"> Peer Learning Interactive Discussion 	–	TB: Pg. 48, 49 (Examples 4-7) TB: Pg. 49 (Drill Time Q. 1-3) WB: Pg. 44, 45 (Q. 17, 19) WB: Pg. 46 (Q. 22)	WB: Pg. 44, 45 (Q. 18, 20) WB: Pg. 46 (Q. 21)	

Annual Day:
28/61

Day:
1/3

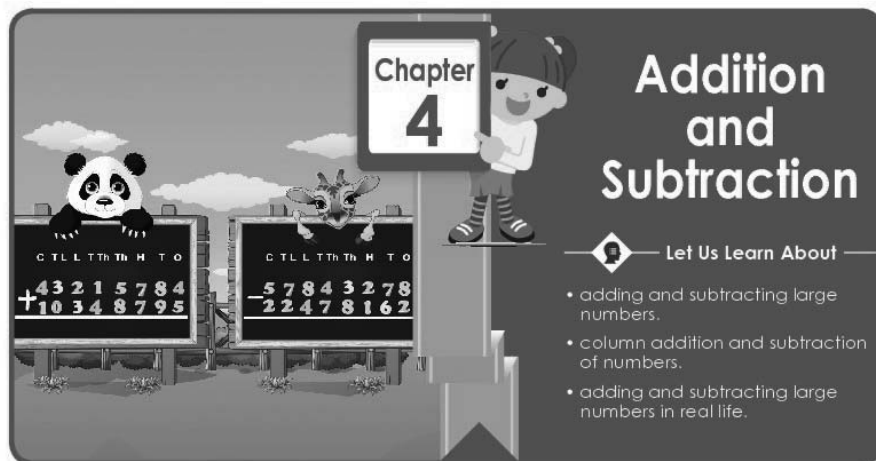
Actual Date:

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Important Words

Duration: 1 min

- **Today:** vertical, column addition



Chapter 4 Addition and Subtraction

Let Us Learn About

- adding and subtracting large numbers.
- column addition and subtraction of numbers.
- adding and subtracting large numbers in real life.

The banner features a cartoon girl holding a sign, a panda, and two boards showing vertical addition and subtraction problems. The addition problem is $43215784 + 10348795$ and the subtraction problem is $57843278 - 22478162$.

Concept 4.1: Add and Subtract Large Numbers



Think

The total population of Pooja's town is 1234567 out of which 876986 are adults. Pooja wanted to know the rest of the people number of in the town. Also, 25378 children were born the next year in that town. Pooja can find the total population of the town the next year.

Do you know how to find the same?



Recall

Recall that we can add and subtract two or more numbers by writing them one below the other. This is called **vertical** or **column addition**.

Let us solve the following to recall addition and subtraction.

- a) $283 + 115$ b) $13652 + 12245$ c) $9685 - 5443$ d) $47645 - 15322$ e) $456789 - 23411$

Transactional Tip(s)

Duration: 28 min



Practising:

- Ask learners to solve all the five examples in TB: Pg. 45, 'Recall', a-e in their notebooks using vertical placement of numbers.
- Solve and discuss WB: Pg. 42, Q. 4-6.

Class Pulse Check

Duration: 1 min



- 1) What is $786 + 245 - 176$?

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2/3

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Remembering and Understanding

In vertical or column addition, write the numbers one below the other, starting with the ones or the units place. In subtraction, write the bigger number at the top.

Example 1: Solve the following:

a) $403050906 + 444333222$

b) $963271087 - 365842719$

Solution:

a)

TC	C	TL	L	TTh	Th	H	T	O
					①			
4	0	3	0	5	0	9	0	6
+	4	4	4	3	3	2	2	2
	8	4	7	3	8	4	1	8

b)

TC	C	TL	L	TTh	Th	H	T	O
⑧	⑮	⑫	⑫	⑥	⑩	⑩	⑦	⑰
9	6	3	0	5	0	9	0	6
-	3	6	5	8	4	2	7	1
	5	9	7	4	2	8	3	6

When adding more than two numbers, we follow the same steps as above.

Example 2:

Solve: $3608926 + 1560863 + 5697528$

Solution:

C	TL	L	TTh	Th	H	T	O
①	①	①	①	②	①	①	
	3	6	0	8	9	2	6
+	1	5	6	0	8	6	3
+	5	6	9	7	5	2	8
1	0	8	6	7	3	1	7

Important Words

- **Last class:** vertical, column addition
- **Today:** –

Transactional Tip(s)

Duration: 13 min



Guided Learning:

- Demonstrate the vertical method of addition and subtraction on the blackboard step by step using TB: Pg. 46, Examples 1, 2.
- Explain the reason for carry-over and borrowing using the concept of regrouping.
- Write the numbers to be added, in a vertical placement, on the blackboard and randomly ask any learner to calculate the sum of that column. Similarly, follow the same procedure for subtraction.
- Solve and discuss WB: Pg. 42, Q. 7-9.

Class Pulse Check

Duration: 1 min



- 1) What is the sum of 20000 and 40000?

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Important Words

–

In some problems, we may have both addition and subtraction together.

Let us solve some examples.

Example 3: Simplify the following:

a) $39154189 + 46673956 - 58127492$ b) $742503 - 346280 + 210028$

Solution: a) First add 39154189 and 46673956. Then subtract 58127492 from the sum.

	C	T L	L	T Th	Th	H	T	O
	①		①		①	①	①	
	3	9	1	5	4	1	8	9
+	4	6	6	7	3	9	5	6
	8	5	8	2	8	1	4	5

	C	T L	L	T Th	Th	H	T	O
	⑦	⑮			⑦	⑩	⑭	
	3	9	8	2	4	1	8	5
-	5	8	1	2	7	4	9	2
	2	7	7	0	0	6	5	3

Therefore, $39154189 + 46673956 - 58127492 = 27700653$.

b) First subtract 346280 from 742503. Then, add 210028 to the difference.

	L	T Th	Th	H	T	O
	⑥	⑬	⑫	④	⑩	
	7	4	2	5	0	3
-	3	4	6	2	8	0
	3	9	6	2	2	3

	L	T Th	Th	H	T	O
	①				①	
	3	9	6	2	2	3
+	2	1	0	0	2	8
	6	0	6	2	5	1

Therefore, $742503 - 346280 + 210028 = 606251$.

Transactional Tip(s)

Duration: 14 min



Practising:

- Ask learners to solve TB: Pg. 47, Example 3 in their notebooks.
- Recall using BODMAS rule wherever required.
- Solve and discuss WB: Pg. 43, Q. 14, 15.
- Instruct learners to assess the answers of their partners.

Class Pulse Check

Duration: 1 min



1) Add 457391 and 753490.



Application

Let us consider a few real-life examples of addition and subtraction of large numbers.

Example 4: Rathan's father bought two houses, one for ₹ 9,56,000 and the other for ₹ 12,48,000. How much money did he spend altogether? By how much is the second house more expensive than the first?

Solution:

Cost of the 1 st house	= ₹ 9,56,000
Cost of the 2 nd house	= + ₹ 12,48,000
Amount Rathan's father spent altogether	= ₹ 22,04,000
Cost of the 2 nd house	= ₹ 12,48,000
Cost of the 1 st house	= – ₹ 9,56,000
Their difference	= ₹ 2,92,000

Therefore, the second house was more expensive than the first house by ₹ 2,92,000.

Example 5: A farmer spent ₹ 17,890 on fertilisers, ₹ 12,865 on seeds and ₹ 16,725 on irrigation. Find the total amount he spent on cultivation.

Solution:

Amount spent on fertilisers	= ₹ 17,890
Amount spent on seeds	= + ₹ 12,865
Amount spent on irrigation	= + ₹ 16,725
Total amount spent	= ₹ 47,480

Therefore, the amount spent on cultivation is ₹ 47,480.



Higher Order Thinking Skills (H.O.T.S.)

Let us now solve a few examples of addition and subtraction by rounding off the numbers.

Example 6: Estimate $672406 - 573348$ by rounding the numbers to the nearest hundreds.

Solution: Rounding the given numbers to the nearest hundreds, we get 672400 and 573300.
Their difference is $6,72,400 - 5,73,300$.
Therefore, the estimated difference of the given numbers is 99100.

L	T	Th	Th	H	T	O
6	7	2	4	0	0	
5	7	3	3	0	0	
0	9	9	1	0	0	

Transactional Tip(s)

Duration: 20 min



Peer Learning - Pair/Group:

- Make groups of two learners and ask them to solve TB: Pg. 48, Examples 4, 5 with mutually.
- Ask them to take few minutes to read and understand each problem and then start solving them.
- After solving, ask any learner from each group to explain each step followed by their group, to reach the answer.
- Solve and discuss WB: Pgs. 44, 45, Q. 17, 19.

Class Pulse Check

1) What is the sum of 39980 and 10000?



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Example 7: The populations of cities A, B and C are 2871428, 3287654 and 1636741 respectively. Find the total population of the three cities. Round off the total population to the nearest thousands.

Solution:	Population of City A	=							
	Population of City B	=	+						
	Population of City C	=	+						
	Total population	=							

TL	L	TTh	Th	H	T	O
2	8	7	1	4	2	8
3	2	8	7	6	5	4
1	6	3	6	7	4	1
7	7	9	5	8	2	3

Rounding off to the nearest thousands, we get 77,96,000.



Drill Time

Concept 4.1: Add and Subtract Large Numbers

1) Solve:

- a) $96704319 + 32640521$ b) $2680054 + 1098366$
c) $3456786 + 2576987$ d) $45678968 + 76894533$

2) Solve:

- a) $89372051 - 76419265$ b) $5396104 - 2278160$
c) $9623175 - 8892431$ d) $8235676 - 5629012$

3) Word problems

- a) There are 35,26,107 mango trees and 24,01,271 apple trees on a farm. How many trees are there in all?
b) A car manufacturing company manufactured 5429756 cars in 2015 and 6721058 cars in 2016. How many more cars were manufactured in 2016 than in 2015?
c) Smitha's ribbon is 378214 cm long, and Keerthi's ribbon is 387261 cm long. Whose ribbon is longer and by how much?
d) A scooter costs ₹ 68925 and a car costs ₹ 923755. How much costlier is the car than the scooter?

Important Words

–

Transactional Tip(s)

Duration: 20 min



Interactive Discussion:

- Ask learners to recall rounding off numbers to the nearest hundreds and thousands.
- Ask learners to round off a few 6-digit numbers to the nearest tens, hundreds and thousands.
- Solve TB: Pg. 48, 49, Examples 6, 7 on the blackboard explaining every step.
- Randomly call learners and discuss every step to arrive at the solution.
- Solve and discuss:
 - TB: Pg. 49, 'Drill Time', Q. 1-3,
 - WB: Pg. 46, Q. 22.

Class Pulse Check



1) -



C – Exit Assessment

	Suggested questions to test the learning objective(s)	Learning objective(s)	Number of learners who answered correctly
1	What will you get if you subtract the sum of 654 and 321 from the sum of 731 and 244? (Ans: 0)	Period 2 - column addition and subtraction of numbers	
2	Solve: $58942652 - 5624812 + 365243$ (Ans: 53683083)	Period 3 - adding and subtracting large numbers	

Post-lesson Reflection						
TB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	WB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
<hr/>						
Enthusiastic participation		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Concept clarity in the classroom		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Concept clarity through the workbook		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

	Handhold Learners	Challenge Learners
Names		
Exam Revision Strategy	Reteach <input type="checkbox"/>	Revise <input type="checkbox"/> Practise <input type="checkbox"/>
App Report	Number _____	Signature _____

Teacher Reference: Textbook

Chapter 4: Addition and Subtraction

Concept 4.1: Add and Subtract Large Numbers

Drill Time

1) Solve:

- a) $96704319 + 32640521 = 129344840$ b) $2680054 + 1098366 = 3778420$
c) $3456786 + 2576987 = 6033773$ d) $45678968 + 76894533 = 122573501$

2) Solve:

- a) $89372051 - 76419265 = 12952786$ b) $5396104 - 2278160 = 3117944$
c) $9623175 - 8892431 = 730744$ d) $8235676 - 5629012 = 2606664$

3) Word problems

- a) There are 35,26,107 mango trees and 24,01,271 apple trees on a farm. How many trees are there in all?
b) A car manufacturing company manufactured 5429756 cars in 2015 and 6721058 cars in 2016. How many more cars were manufactured in 2016 than in 2015?
c) Smitha's ribbon is 378214 cm long, and Keerthi's ribbon is 387261 cm long. Whose ribbon is longer and by how much?
d) A scooter costs ₹ 68925 and a car costs ₹ 923755. How much costlier is the car than the scooter?

Solution: a) 59,27,378 trees

b) 1291302 cars

c) Keerthi's ribbon is longer by 9047 cm

d) Car is costlier than a the scooter by ₹ 854830



Chapter 4

Addition and Subtraction

Concept 4.1: Add and Subtract Large Numbers



Recall

Multiple Choice Questions

- 1) The sum of two numbers is 50000. The numbers are _____. [C]
(A) 20000 and 29000 (B) 40000 and 20000
(C) 45000 and 5000 (D) 4000 and 47000
- 2) The difference between 9003 and 9000 is _____. [A]
(A) 3 (B) 300 (C) 8997 (D) 1997
- 3) The sum of 380000 and 210000 is _____. [D]
(A) 480000 (B) 59000 (C) 580000 (D) 590000



Remembering and Understanding

Multiple Choice Questions

- 4) The sum of the digits in the ten lakhs places of the numbers 11222022 and 36578194 is _____. [D]
(A) 1 (B) 2 (C) 3 (D) 7
- 5) The difference between the digits in the crores places of 11234789 and 11324897 is _____. [A]
(A) 0 (B) 8 (C) 1 (D) 2
- 6) The sum of the digits in the billions and the millions places of the number 4592317834 is _____. [D]
(A) 10 (B) 1 (C) 0 (D) 6

Fill in the Blanks

- 7) The sum of the largest 5-digit number and its successor is 199999.
- 8) The difference between the smallest 7-digit number and its predecessor is a 1 -digit number.
- 9) The number of lakhs in the sum of 704532 and 658843 is 13.

Very Short Answer Questions

- 10) Find the difference when we subtract 500000 from 800000.
Solution: 300000
- 11) Add: 222222 and 333333
Solution: 555555
- 12) Solve: $477342 - 477341$
Solution: 1

Short Answer Questions

- 13) Add 10500 to 40000 and subtract 2000 from the sum.
Solution: $10500 + 40000 = 50500$
 $50500 - 2000 = 48500$
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.....

- 14) Add: 712493 and 187518

L	T	Th	H	T	O
①	①	①	①	①	
7	1	2	4	9	3
+	1	8	7	5	1
9	0	0	0	1	1

Long Answer Questions

- 15) Solve the following:
- a) What should be added to 10012842 to get a sum of 23712900?
- b) By how much is 14607862 less than 23700975?

Solution: a)

C	TL	L	TL	Th	H	T	O
					8	9	10
2	3	7	1	2	9	0	0
1	0	0	1	2	8	4	2
1	3	7	0	0	0	5	8

b)

C	TL	L	TL	Th	H	T	O
1	13	6	9	10			
2	2	7	0	0	9	7	5
1	4	6	0	7	8	6	2
0	9	0	9	3	1	1	3

Therefore, 13700058 is to be added Therefore, 14607862 is less than
to 10012842 to get 23712900. 23700975 by 9093113.

16) Solve: 4321181 + 3848132 + 1132008

Solution:

TL	L	TL	Th	H	T	O
1	1	1		1	1	
4	3	2	1	1	8	1
+	3	8	4	8	1	3
+	1	1	3	2	0	0
9	3	0	1	3	2	1



Application

Short Answer Questions

17) Amit has two apartments in Pune. The price of the first apartment is ₹ 21218116 and the price of the second apartment is ₹ 30817108. What is the total price of both the apartments?

Solution: Price of the first apartment = ₹ 21218116
Price of the second apartment = ₹ 30817108
Total price of both apartments = Price of the first apartment + second apartment
₹ 21218116 + ₹ 30817108 = ₹ 52035224

Therefore, the total price of both apartments is ₹ 5,20,35,224.

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18) A factory manufactures 11213118 nuts and 1208108 bolts in a year. How many more nuts than bolts does it manufacture?

Solution: Number of nuts manufactured = 11213118
 Number of bolts manufactured = 1208108
 Number of nuts manufactured more than bolts =

 Number of nuts – Number of bolts

 = 11213118 – 1208108 = 10005010
 Therefore, the factory manufactures 10005010 more nuts than bolts in a year.

Long Answer Questions

19) The population of Country A is 124755990 and the population of Country B is 105678880. By what number is the population of B less than that of A? Write the difference in words.

Solution: Population of Country A = 124755990
 Population of Country B = 105678880
 Difference in the population of the two countries
 = Population of Country A – Population of Country B
 = 124755990 – 105678880 = 19077110

Therefore the population of Country B is less by one crore ninety lakh seventy-seven thousand one hundred and ten.

20) The sum of 75,18,08,112 and 22,34,184 is subtracted from 96,42,18,684. What is the difference obtained?

Solution: The given numbers are 751808112, 2234184 and 964218684
 The required sum: 751808112 + 2234184 = 754042296
 The required difference: 964218684 – 754042296 = 210176388
 Therefore, the difference obtained is 210176388.

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Short Answer Question

21) By how much is 1,46,17,862 less than 2,77,00,900?

Solution: $2,77,00,900 - 1,46,17,862 = 1,30,83,038$

Therefore, 1,46,17,862 is less than 2,77,00,900 by 1,30,83,038.

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Long Answer Question

22) In a group of schools, there are 17,86,45,128 students divided in two teams. Out of these 7,45,36,200 are in Team A. What is the number of students in Team B? Which team has more number of students and by how much?

Solution: Total number of students = 17,86,45,128

Number of students in Team A = 74536200

Number of students in Team B =

= Total number of students – students in Team A

= $178645128 - 74536200$

= 104108928

As $104108928 > 74536200$, the number of students in Team B is more.

The difference in the number of students in the both the teams

= $104108928 - 74536200$

= 29572728

Therefore, there are 29572728 students more in Team B than in Team A.

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Practice Questions

Solve the following:

- 1) What is the sum of 3897184 and 4930193?
- 2) What should 1874899 be subtracted from to get a difference of 3481984?
- 3) What should be added to 67819489 to get the sum as 81101289?
- 4) What is the difference if 870130191 is subtracted from 980091840?
- 5) What is the difference between 78791039 and 37849102?
- 6) Solve: $72849183 = ? - 18492842$
- 7) What should be added to 8928371 to get 9829381?
- 8) What is the sum of the largest 7-digit number and the smallest 8-digit number?
- 9) What should be added to 09839487 to get 10983942?
- 10) Find the missing number in:
 $39103948 - 1093?482 = 28164466$
- 11) What is the difference between the smallest 8-digit number and the largest 7-digit number?
- 12) What should be added to 8719203 to get 98183728?
- 13) What is the digit in the thousands place in the sum of 5810402 and 3294000?
- 14) Solve: a) $57849820 - 48379304$ b) $12482308 - 10321827$
- 15) Find the missing number: $? + 3900897 = 8719284$
- 16) Find the missing number: $78193810 - ? = 19301913$
- 17) Find the missing digit in:
 $8794?20 - 3492817 = 5302003$
- 18) What is the digit in the hundreds place in the sum of 89481918 and 1984928?
- 19) Solve: $55728402 = 48193850 + ?$
- 20) What is the difference between 18301948 and 1830194?
- 21) There are 1920394 trees in a forest and 2910395 trees in another forest. Calculate the total number of trees in both the forests.

- 22) A milk dairy produces 78392847 mL of milk every day. It uses 2839481 mL for preparing milk products like cheese. What amount of milk is not used for milk products?
- 23) A printing company prints 3892849 pages a day. Another company prints 3910380 pages. How many more pages does one company print than the other?
- 24) There are 1903928 animals in Forest A and 2910294 animals in Forest B. How many more animals are there in Forest B?
- 25) The distance between City A and City B is 3827909 metres. The distance between City B and City C is 2918491 metres. What is the total distance from City A to City C?
- 26) The radius of Planet 1 is 60268000 m and that of Planet 2 is 2764000 m. Which planet is bigger and by how much?
- 27) A packaging company manufactures 3762938 brown boxes and 2938492 white boxes in a week. How many boxes does it manufacture in all?
- 28) There are 10924923 ants in Anthill A and 10482749 ants in Anthill B. Find the total number of ants in both the anthills?
- 29) 20482912 shells were found on one beach and 19909283 on the other. What was the total number of seashells found?
- 30) The length of all the roads in Country A is 5603293 km and in Country B 1751868 km. Which country has the longer roads and by how much?

Teacher Reference: Workbook

Chapter 4: Addition and Subtraction



Practice Questions

- | | |
|------------------------|--|
| 1) 8827377 | 2) 5356883 |
| 3) 13281800 | 4) 109961649 |
| 5) 40941937 | 6) 91342025 |
| 7) 901010 | 8) 19999999 |
| 9) 1144455 | 10) 9 |
| 11) 1 | 12) 89464525 |
| 13) 4 | 14) a) 9470516
b) 2160481 |
| 15) 4818387 | 16) 58891897 |
| 17) 8 | 18) 8 |
| 19) 7534552 | 20) 16471754 |
| 21) 4830789 trees | 22) 75553366 mL |
| 23) 17531 pages | 24) 1006366 animals |
| 25) 6746400 m | 26) Planet 1 is bigger by 57504000 m |
| 27) 6701430 boxes | 28) 21407672 ants |
| 29) 40392195 seashells | 30) Country A has longer roads by 3851425 km |

A – Curriculum to Learning Objectives: Multiplication

Prior Knowledge		• Number sense, addition, subtraction, place value system, counting				
Class	Ch. No.	Chapter Name	C. No.	Concept Name	L. Obj. No.	Learning Objectives
2	8	Multiplication	8.1	Concept of Repeated Addition	8.1.a	• repeated addition
			8.2	Skip Counting	8.2.a	• skip counting
					8.2.b	• multiplication tables from 2 to 6
3	6	Multiplication	6.1	Multiply 2-digit Numbers	6.1.a	• multiplying 2-digit numbers by 1-digit
			6.2	Multiply 3-digit Numbers by 1-digit and 2-digit Numbers	6.2.a	• multiplying 3-digit numbers by 1-digit and 2-digit numbers with and without regrouping
			6.3	Double 2-digit and 3-digit Numbers Mentally	6.3.a	• doubling the numbers mentally
4	5	Multiplication	5.1	Multiply 3-digit and 4-digit Numbers	5.1.a	• multiplying 3-digit numbers by 3-digit and 4-digit numbers by 1-digit number
					5.1.b	• properties of multiplication
			5.2	Multiply Using Lattice Algorithm	5.2.a	• multiplying using lattice algorithm
			5.3	Mental Maths Techniques: Multiplication	5.3.a	• multiplying two numbers mentally
5	5	Multiplication	5.1	Multiply Large Numbers	5.1.a	• properties of multiplication
					5.1.b	• multiplying 4-digit and 5-digit by 2-digit and 3-digit numbers
					5.1.c	• finding the missing numbers in the given product
					5.1.d	• observing patterns in multiplication of numbers

B – Vision-to-Action Plan: 5.1 Multiply Large Numbers

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
1 DD/MM/YYYY	50 – THK, RCL	5.1.a	<ul style="list-style-type: none"> Recall the product of a 4-digit number and a 1-digit number. 	<ul style="list-style-type: none"> Practising 	–	–	–	
2 DD/MM/YYYY	51 – RCL	5.1.a	<ul style="list-style-type: none"> Discuss and understand properties of multiplication. 	<ul style="list-style-type: none"> Questioning 	<ul style="list-style-type: none"> Materials for multiplication chart 	WB: Pgs. 49, 50 (Q. 4-6)	WB: Pg. 49 (Q. 1-3)	
3 DD/MM/YYYY	51, 52 – REM/UND	5.1.b	<ul style="list-style-type: none"> Demonstrate the steps in multiplying a 4-digit number by a 2-digit number and a 3-digit number. 	<ul style="list-style-type: none"> Direct Instruction 	<ul style="list-style-type: none"> Chart of Multiplication Table 	TB: Pg. 52 (Example 1,2) WB: Pg. 50 (Q. 7-9)	WB: Pg. 50 (Q. 10-12)	
4 DD/MM/YYYY	52-54 – APP	5.1.b	<ul style="list-style-type: none"> Practice multiplication of a 4-digit number by a 2-digit number and a 3-digit number. 	<ul style="list-style-type: none"> Guided Learning Interactive Discussion 	–	TB: Pgs. 52-54 (Examples 3-7) WB: Pg. 50 (Q. 13, 15) WB: Pgs. 52, 53 (Q. 17, 20)	WB: Pg. 50 (Q. 14, 16) WB: Pgs. 52, 53 (Q. 18, 19)	
5 DD/MM/YYYY	55, 56 – HOTS	5.1.c	<ul style="list-style-type: none"> Use strategies to find the missing numbers in vertical multiplication. 	<ul style="list-style-type: none"> Interactive Discussion 	–	TB: Pg. 55, 56 (Example 8-10) WB: Pg. 54 (Q. 22)	WB: Pg. 54 (Q. 21)	

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
6 DD/MM/YYYY	56 – Drill Time	5.1.c	<ul style="list-style-type: none"> Solve large multiplication problems based on real-life situations. 	<ul style="list-style-type: none"> Summarising 	–	TB: Pg. 56 (Drill Time Q. 1,2)	–	

Annual Day:
31/61

Day:
1/6

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Important Words

Duration: 1 min

- **Today:** identity property, multiplicative identity

Chapter 5 Multiplication

Let Us Learn About

- properties of multiplication.
- multiplying 4-digit and 5-digit by 2-digit and 3-digit numbers.
- finding the missing numbers in the given product.
- observing patterns in multiplication of numbers.

The graphic features a cartoon girl holding a sign that says 'Chapter 5 Multiplication'. To the left, there are two multiplication problems on boards. The first board shows a panda and the problem 1278949×1278949 . The second board shows a deer and the problem 1278949×1278949 . The boards have columns labeled T, L, L, T, Th, H, T, O.

Concept 5.1: Multiply Large Numbers



Think

Pooja's mother bought 1750 kg of rice for the whole year at the price of ₹ 48 per kilogram. She asked Pooja to check if the bill is correct. How do you think Pooja can check it?



Recall

We have already learnt how to multiply a 4-digit number by a 1-digit number. Let us recall the basic concepts of multiplication.

Properties of Multiplication

Identity Property: For any number 'a', $a \times 1 = 1 \times a = a$.

1 is called the **multiplicative identity**.

For example, $213 \times 1 = 1 \times 213 = 213$.

Transactional Tip(s)

Duration: 28 min



Practising:

- Discuss TB: Pg. 50 'Think' with the class.
- Discuss real-life examples on how we use multiplication and division on a daily basis.

Class Pulse Check

Duration: 1 min



1) True or False: $4 \times 5 \times 6 = 6 \times 5 \times 2 \times 2$

Annual Day:
32/61

Day:
2/6

Actual Date:

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Zero Property: For any number 'a', $a \times 0 = 0 \times a = 0$.

For example, $601 \times 0 = 0 \times 601 = 0$.

Commutative Property: If 'a' and 'b' are any two numbers, then $a \times b = b \times a$.

For example, $25 \times 7 = 175 = 7 \times 25$.

Associative Property: If 'a', 'b' and 'c' are any three numbers,

then $a \times (b \times c) = (a \times b) \times c$.

For example, $3 \times (4 \times 5) = (3 \times 4) \times 5$

$$3 \times 20 = 12 \times 5$$

$$60 = 60$$

Let us answer the following to revise the multiplication of 4-digit numbers.

<p>a) Th H T O</p> <table border="1"> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td>3</td><td>2</td><td>3</td></tr> <tr><td>x</td><td></td><td></td><td>2</td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>						3	2	3	x			2					<p>b) Th H T O</p> <table border="1"> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td>1</td><td>2</td><td>7</td></tr> <tr><td>x</td><td></td><td></td><td>8</td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>						1	2	7	x			8					<p>c) Th H T O</p> <table border="1"> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td>4</td><td>5</td><td>6</td></tr> <tr><td>x</td><td></td><td></td><td>5</td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table>						4	5	6	x			5				
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Remembering and Understanding

Multiplication of large numbers is the same as multiplication of 4-digit or 5-digit numbers by 1-digit numbers. If an 'x'-digit number is multiplied by a 'y'-digit number, then their product is not more than a '(x + y)'-digit number.

Let us solve some examples of multiplication of large numbers.

Important Words

Duration: 1 min

- **Last class:** identity property, multiplicative identity
- **Today:** zero property, Commutative property, associative property

Transactional Tip(s)

Duration: 28 min



Questioning:

- Discuss the properties of multiplication by giving examples for each property.
- Display the multiplication chart in the classroom enlisting all the properties clearly. You can also take learner's help to make the chart. (You can also allot a particular time to make the multiplication chart).
- Randomly call learners and question them about the properties of multiplication. Recall and revise multiplication of a 4-digit number by a 1-digit number using TB: Pg. 51 multiplication questions. Let them use the multiplication chart for their reference.
- Solve and discuss WB: Pgs. 49, 50, Q. 4-6.

Class Pulse Check

Duration: 1 min



1) Is $4 \times (5 \times 6) = (4 \times 5) \times 6$?

Example 1: Find these products.

a) 2519×34 b) 4625×17

Solution:

a)	T	Th	Th	H	T	O	
			1		2		
			2		3		
			2	5	1	9	
				x	3	4	
			1				
	1	0	0	7	6		→ 2519×4 ones
+	7	5	5	7	0		→ 2519×3 tens
	8	5	6	4	6		→ 2519×34

b)	T	Th	Th	H	T	O	
			4	1	3		
			4	6	2	5	
				x	1	7	
			1				
	3	2	3	7	5		→ 4625×7 ones
+	4	6	2	5	0		→ 4625×1 tens
	7	8	6	2	5		→ 4625×17

Example 2: Find the product of 3768 and 407.

Solution:

	T	L	T	Th	Th	H	T	O	
					3	2	3		
					5	4	5		
					3	7	6	8	
					x	4	0	7	
			1						
			2	6	3	7	6		→ 3768×7 ones
+	1	5	0	7	2	0	0		→ 3768×4 hundreds
	1	5	3	3	5	7	6		→ 3768×407

Here we can skip the step ' 3768×0 ' but, add one more zero in tens place while multiplying by hundreds digit.

Example 3: Estimate the number of digits in the product of 58265 and 73. Then multiply and verify your answer.

Solution: The number of digits in the multiplicand 58265 is five.

The number of digits in the multiplier 73 is two.

Total number of digits is seven.

Therefore, the product of 58265 and 73 should not have more than seven digits.

Important Words

- **Last class:** zero property, Commutative property, associative property
- **Today:** –

Transactional Tip(s)

Duration: 28 min



Direct Instruction:

- Use Classklap Chart of Multiplication Table and explain the step-by-step solution to multiply a 4-digit number by a 2-digit number as mentioned in TB: Pg. 51.
- Use TB: Pg. 52, Examples 1, 2 to explain the steps.
- Solve and discuss WB: Pg. 50, Q. 7-9.

Class Pulse Check

Duration: 1 min



- 1) How do you multiply a 4-digit number with 100?

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34/61

Day:
4/6

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Important Words

Duration: 1 min

–

	T L	L	T Th	Th	H	T	O
			(5)	(1)	(4)	(3)	
			(2)		(1)	(1)	
			5	8	2	6	5
					x	7	3
		(1)	(1)	(1)	(1)		
		1	7	4	7	9	5
→ 58265 × 3 ones							
+	4	0	7	8	5	5	0
→ 58265 × 7 Tens							
	4	2	5	3	3	4	5
→ 58265 × 73							

The number of digits in the product 4253345 is 7.

Hence, verified.

Example 4: Find the product of 24367 and 506.

Solution:

	T L	L	T Th	Th	H	T	O
			(2)	(1)	(3)	(3)	
			(2)	(2)	(4)	(4)	
			2	4	3	6	7
					x	5	0
		(1)					
		1	4	6	2	0	2
→ 24367 × 6 ones							
+	1	2	1	8	3	5	0
→ 24367 × 5 hundreds							
	1	2	3	2	9	7	0
→ 24367 × 506							



Application

We use multiplication of numbers in many real-life situations. Let us see a few examples.

Transactional Tip(s)

Duration: 28 min



Guided Learning:

- Recall the previous day's learning to understand large number multiplication.
- Use TB: Pgs. 52, 53, Examples 3, 4 for the multiplication of a 4-digit number by a 3-digit number.
- Define each step and ask learners to give the result at each step. Write the results of each step while explaining and give hints as and when required.
- Solve and discuss WB: Pg. 50, Q. 13, 15.

Class Pulse Check

Duration: 1 min



- Which is the product of the greatest 4-digit number and the smallest 2-digit number?

Annual Day:
34/61

Day:
4/6

Actual Date:

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Important Words

–

Example 5: A farmer has 6350 acres of mango farm. If he needs 58 kg of fertiliser for each acre, how many kilograms of fertiliser does he need in all?

Solution: Quantity of fertiliser required for 1 acre of farm = 58 kg

Quantity of fertiliser required for 6350 acres of farm = 6350×58 kg
= 368300 kg

L	T	Th	Th	H	T	O
			①	②		
			②	④		
			6	3	5	0
				x	5	8
			①			
			5	0	8	0
			3	1	7	5
			3	6	8	3

Example 6: The cost of one fridge is ₹ 9528. What is the cost of 367 such fridges?

Solution: Cost of one fridge = ₹ 9528

Cost of 367 fridges = ₹ 9528×367

T	L	T	Th	Th	H	T	O
				①		②	
				③	①	④	
				③	①	⑤	
				9	5	2	8
				x	3	6	7
				①	①	①	①
				6	6	6	9
				5	7	1	6
				2	8	5	8
				3	4	9	6

Therefore, the cost of 367 fridges is ₹ 3496776.

Example 7: A clothier sells different suiting and shirting and earns ₹ 48657 per day. How much does he earn in one week?

Solution: Amount earned by a clothier in one day = ₹ 48657

Amount earned by him in one week (7 days) = ₹ 48657×7

Therefore, amount earned by the clothier in a week is ₹ 340599.

L	T	Th	Th	H	T	O
			⑥	④	③	④
			4	8	6	5
					x	7
			3	4	0	5

Transactional Tip(s)

Duration: 14 min



Interactive Discussion:

- Use TB: Pg. 54, Examples 5-7 for the multiplication of a 4-digit number by a 3-digit, 2-digit or 1-digit number.
- Define each step and ask learners to give the result at each step. Write the results of each step while explaining and give hints as and when required.
- Solve and discuss WB: Pgs. 52, 53, Q. 17, 20.

Class Pulse Check

Duration: 1 min



- 1) What is the product of 1000 and 222?

Annual Day:
35/61

Day:
5/6

Actual Date:

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Important Words

–



Higher Order Thinking Skills (H.O.T.S.)

Let us see a few more real-life examples involving multiplication of large numbers.

Example 8: A cloth mill produces 8573 m of cloth in a day. How many metres of cloth can it produce in January, if there are six holidays in the month?

Solution: Length of the cloth produced by a cloth mill in a day = 8573 m
In January, if six days are holidays, the number of working days = $31 - 6 = 25$
Length of cloth produced in 25 days = $8573 \text{ m} \times 25$
 $= 214325 \text{ m}$

Example 9: Find the missing numbers in the given product.

	T	Th	Th	H	T	O
			3	4	1	7
				x	6	3
		1	○	2	○	1
+	○	0	5	○	2	0
	2	1	○	2	7	1

Solution:

	T	Th	Th	H	T	O
			3	4	1	7
				x	6	3
		1	○	2	○	1
+	○	0	5	○	2	0
	2	1	○	2	7	1

Example 10: Observe the pattern and write the next two terms.

$$4 \times 4 = 16$$

$$34 \times 34 = 1156$$

$$334 \times 334 = 111556$$

Transactional Tip(s)

Duration: 29 min



Interactive Discussion:

- Divide the class into groups and assign TB: Pg.55, 56 Example 8-10. Assign one example to each group.
- Learners should discuss the results within their group and help their group members if they are stuck.
- Solve and discuss WB: Pg. 54, Q. 22.

Class Pulse Check

Duration: 1 min



1) What is the total number of hours in 10 days?

Annual Day:
36/61

Day:
6/6

Actual Date:

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Important Words

–

Solution: The next two terms in the given pattern are

$$3\ 3\ 3\ 4 \times 3\ 3\ 3\ 4 = 1\ 1\ 1\ 1\ 5\ 5\ 5\ 6$$

$$3\ 3\ 3\ 3\ 4 \times 3\ 3\ 3\ 3\ 4 = 1\ 1\ 1\ 1\ 1\ 5\ 5\ 5\ 5\ 6$$



Drill Time

Concept 5.1: Multiply Large Numbers

1) **Solve:**

a) 12345×7 b) 90962×113 c) 3578×575 d) 8869×450 e) 5124×52

2) **Word problems**

- a) A cloth factory produces 32674 m of cloth in a week. How many metres of cloth can the factory produce in 6 weeks?
- b) A table costs ₹ 1354. Find the cost of 73 such tables.
- c) Find the product of the largest 4-digit number and the largest 2-digit number.
- d) There are 5606 bags of rice in a storehouse. If each bag weighs 62 kg, what is the total weight of the bags of rice?

Transactional Tip(s)

Duration: 30 min



Summarising:

- Recall the steps and strategies for large number multiplication with learners.
- Solve and discuss TB: Pg. 56, 'Drill Time', Q. 1, 2.

Class Pulse Check

1) -





C – Exit Assessment

	Suggested questions to test the learning objective(s)	Learning objective(s)	Number of learners who answered correctly
1	Name the properties shown by the following: $a \times b = b \times a$ (Ans. Commutative property)	Period 1 - properties of multiplication	
2	Find the product 15232×889 (Ans. 13541248)	Period 3 - multiplying 4-digit and 5-digit by 2-digit and 3-digit numbers	
3	What will be the product if 3465 is multiplied by itself. (Ans. 12006225)	Period 6 - multiplying 4-digit and 5-digit by 2-digit and 3-digit numbers	
4	A company sells 4568 mobiles per day. How many mobiles will it sell in the year 2020? (Ans. 16771888)	Period 4 - multiplying 4-digit and 5-digit by 2-digit and 3-digit numbers	

Post-lesson Reflection						
TB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	WB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Enthusiastic participation		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Concept clarity in the classroom		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Concept clarity through the workbook		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

	Handhold Learners	Challenge Learners
Names		
Exam Revision Strategy	Reteach <input type="checkbox"/> Revise <input type="checkbox"/>	Practise <input type="checkbox"/>
App Report	Number _____	Signature _____

Teacher Reference: Textbook

Chapter 5: Multiplication

Concept 5.1: Multiply Large Numbers

Drill Time

1) Solve:

a) $12345 \times 7 = \mathbf{86415}$

b) $90962 \times 113 = \mathbf{10278706}$

c) $3578 \times 575 = \mathbf{2057350}$

d) $8869 \times 450 = \mathbf{3991050}$

e) $5124 \times 52 = \mathbf{266448}$

2) Word problems

a) A cloth factory produces 32674 m of cloth in a week. How many metres of cloth can the factory produce in 6 weeks?

b) A table costs ₹ 1354. Find the cost of 73 such tables.

c) Find the product of the largest 4-digit number and the largest 2-digit number.

d) There are 5606 bags of rice in a storehouse. If each bag weighs 62 kg, what is the total weight of the bags of rice?

Solution: a) 196044 m

b) ₹ 98842

c) 989901

d) 347572 kg

Concept 5.1: Multiply Large Numbers

Recall

Multiple Choice Questions

- 1) For any three numbers 'a', 'b' and 'c', $a \times (b \times c) = (a \times b) \times c$ is a _____. [B]
(A) subtraction property (B) associative property
(C) identity property (D) both (B) and (C)
- 2) For any number 'a', $a \times 1 = 1 \times a = a$ is called the _____. [C]
(A) subtraction property (B) multiplicative property
(C) multiplicative identity (D) both (B) and (C)
- 3) For any 3 numbers 'a', 'b' and 'c', $a \times (b + c) = (a \times b) + (a \times c)$ is a _____. [B]
(A) subtraction property (B) distributive property
(C) multiplicative identity (D) both (B) and (C)

Remembering and Understanding

Multiple Choice Questions

- 4) When an 'x' digit number is multiplied by a 'y' digit number, the product will not be more than ____ digits. [A]
(A) $x + y$ (B) $x - y$ (C) $x \times y$ (D) $x \div y$
- 5) The digit in the ones place of the product of 11111 and 111 is _____. [A]
(A) 1 (B) 6 (C) 8 (D) 3

- 6) The digit in the ones place of the product of 22222 and 22 is _____. [C]
- (A) 1 (B) 5 (C) 4 (D) 6

Fill in the Blanks

- 7) The product of the largest 2-digit number by itself has four digits.
- 8) $3215 \times 23 = \underline{20} \times 3215 + 3 \times 3215$
- 9) The digit in the ones place of the product 7045×173 is 5.

Very Short Answer Questions

- 10) Find the product of 1000 and 100.

Solution:

- 11) Find the product of 30000 and 200.

Solution:

- 12) What is the maximum number of digits in the product when a 4-digit number is multiplied by a 2-digit number?

Solution: 6 digits
.....
.....

Short Answer Questions

- 13) Multiply 2568 and 15.

Solution:

	T	Th	H	T	O
	②	③	④		
	2	5	6	8	
		x	1	5	
	①	①			
1	2	8	4	0	
+	2	5	6	8	0
	3	8	5	2	0

→ 2568×5 ones
→ 2568×1 tens
→ 2568×15

.....
.....

- 14) Multiply the largest 4-digit number by the largest 2-digit number.

Solution:

L	T	Th	H	T	O
		8	8	8	
		9	9	9	9
			x	9	9
1	1	1	1	1	
	8	9	9	9	1
8	9	9	9	1	0
9	8	9	9	0	1

Long Answer Questions

- 15) Find the products: a) 6609×218

b) 1234×106

Solution: a)

TL	L	T	Th	H	T	O
		1			1	
		4			7	
		6	6	0	9	
		x	2	1	8	
1	1	1	1	1		
	5	2	8	7	2	
	6	6	0	9	0	
1	3	2	1	8	0	0
1	4	4	0	7	6	2

b)

L	T	Th	H	T	O
		1	2	2	
		1	2	3	4
		x	1	0	6
	1				
		7	4	0	4
		0	0	0	0
	1	2	3	4	0
	1	3	0	8	0

- 16) Find the products of: a) 58265 and 73

b) 24367 and 506

Solution: a)

TL	L	T	Th	H	T	O
		5	1	4	3	
		2		1	1	
		5	8	2	6	5
				x	7	3
1	1	1	1	1		
1	7	4	7	9	5	
4	0	7	8	5	5	0
4	2	5	3	3	4	5

b)

C	TL	L	T	Th	H	T	O
			2	1	3	3	
			2	2	4	4	
			2	4	3	6	7
				x	5	0	6
		1					
		1	4	6	2	0	2
	0	0	0	0	0	0	0
1	2	1	8	3	5	0	0
1	2	3	2	9	7	0	2



Application

Short Answer Questions

- 17) There are 5606 bags of rice in a store house. If each bag weighs 62 kg, what is the total weight of the bags?

Solution: Number of rice bags in a store house = 5606
 Weight of each bag = 62 kg
 Total weight of the bags
 = Number of bags \times Weight of each bag
 = 5606×62 kg = 347572 kg
 Therefore, the total weight of the bags is 347572 kg.

L	T	Th	H	T	O
		③		③	
		①		①	
		5	6	0	6
			x	6	2
	1	1	2	1	2
3	3	6	3	6	0
3	4	7	5	7	2

- 18) There are 2500 tanks, each of 35 litres capacity. Find the total capacity of all the tanks.

Solution: Number of tanks = 2500
 Capacity of each tank = 35 l
 Total capacity of all the tanks = Number of tanks \times Capacity of one tank

T	Th	H	T	O
①	②			
	2	5	0	0
		x	3	5
1	2	5	0	0
+	7	5	0	0
8	7	5	0	0

Therefore, the total capacity of all the tanks is 87500 l.

Long Answer Questions

19) Anan bought 536 electric ovens at ₹ 3920 each for his shop. How much money did he spend in all?

Solution: Number of ovens = 536
Cost of one electric oven = ₹ 3920
Cost of 536 electric ovens
= Number of ovens × Cost of one oven
= $536 \times ₹ 3920 = ₹ 2101120$
Therefore, the total cost of 536 ovens
is ₹ 2101120.

TL	L	TTh	Th	H	T	O
		④		①		
			②			
			⑤	①		
			3	9	2	0
			x	5	3	6
①	①	①	①			
		2	3	5	2	0
	1	1	7	6	0	0
1	9	6	0	0	0	0
2	1	0	1	1	2	0

20) A shop has 2568 chocolates, which cost ₹ 25 each and 4598 biscuit packets, which cost ₹ 18 each. Find the total cost of all the chocolates and biscuit packets.

Solution: Cost of each chocolate = ₹ 25
Number of chocolates = 2568
Cost of each biscuit packet = ₹ 18
Number of biscuits = 4598
Total cost of 2568 chocolates
= Number of chocolates × Cost of each chocolate
= $2568 \times ₹ 25 = ₹ 64200$
Cost of 4598 biscuit packets
= Number of biscuit packets × Cost of each biscuit packet
= $4598 \times ₹ 18 = ₹ 82764$
The cost of both chocolates and biscuit packets is
= ₹ 64200 + ₹ 82764 = ₹ 146964
Therefore, the total cost of the chocolates and the biscuit packets is ₹ 146964.



Short Answer Question

21) Find the missing numbers in these products.

a)	T	Th	H	T	O
		3	4	1	7
			x	6	3
	1	0	2	5	1
+					
2	0	5	0	2	0
2	1	5	2	7	1

b)	T	Th	H	T	O
		2	8	3	2
			x	8	7
	1	9	8	2	4
+					
2	2	6	5	6	0
2	4	6	3	8	4

Long Answer Question

22) Observe the patterns and write the next two terms.

a) $7 \times 7 = 49$

$67 \times 67 = 4489$

$667 \times 667 = 444889$

b) $9 \times 8 = 72$

$99 \times 88 = 8712$

$999 \times 888 = 887112$

Solution: The next two terms are:

a) $6667 \times 6667 = 4448889$

$66667 \times 66667 = 444488889$

b) $9999 \times 8888 = 88871112$

$99999 \times 88888 = 8888711112$

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Practice Questions

- 1) If 541 multiplied by 1 is 541, what is the product when 1 is multiplied by 541?
- 2) What is the product when 783 is multiplied by 0?
- 3) What is the product of 3791 and 8?
- 4) Find the product of: a) 8472 and 3 b) 4723 and 2 c) 1198 and 3
- 5) What is the product when 4728 is multiplied by 12?
- 6) Find the product of: a) 9813 and 21 b) 2726 and 11 c) 2319 and 17
- 7) Find the product of: a) 19204 and 10 b) 12612 and 10 c) 78230 and 10
- 8) Estimate the number of digits in the product of 7918 and 132.
- 9) What is the digit in the hundreds place in the product of 2910 and 44?
- 10) Solve: a) 9284×192 b) 4762×136 c) 7824×221
- 11) Find the product of 1893 and 399.

- 12) What is the sum of the digits in the ones place and the tens place in the product of 28401 and 500?
- 13) What is the product of 78193 and 209?
- 14) Solve: a) 56923×827 b) 11111×111 c) 22222×333
- 15) What is the product of 1111 and 111?
- 16) Find the product of: a) 47183 and 12 b) 23162 and 13 c) 41211 and 21
- 17) What is the product of 44444 and 44?
- 18) Estimate the number of digits in the product of 58391 and 22.
- 19) Find the missing numbers in Q.19 and 20.
- $$\begin{array}{r} 2 \quad 2 \quad 2 \quad 2 \\ \times \quad \quad \quad 3 \quad 3 \\ \hline \end{array}$$
- $$\begin{array}{r} 6 \quad 6 \quad ? \quad 6 \\ + \quad 6 \quad 6 \quad 6 \quad 0 \\ \hline \end{array}$$
- $$\begin{array}{r} 7 \quad ? \quad 3 \quad 2 \quad 6 \\ \hline \end{array}$$
- 20) Find the missing number: $8 \times 4 = 32$
 $8 \times 40 = 320$
 $8 \times 400 = ?$
- 21) If a man earns ₹ 3919 per day, how much will he earn in 29 days?
- 22) A printing company prints 49281 pages per day. How many pages will it print in 79 days?
- 23) There are 19840 beans in a bag. How many beans will you find in 433 bags?
- 24) Shekhar bought 1980 jigsaw puzzles. Each puzzle had 23 pieces. How many total puzzle pieces did Shekhar get?
- 25) A factory produce 48294 litres of tomato ketchup each day. How many litres of ketchup will it produce in 86 days?
- 26) A carton has 95 balls. How many balls will be there in 4723 cartons?
- 27) 12 pieces of capsicum were used for 1 pizza. How many pieces will be used for 827394 pizzas?
- 28) A tempo of fruits carries 2984 oranges. How many oranges will 287 tempos carry?
- 29) Salim drove 39201 metres in a day. How much distance did he cover in 843 days?
- 30) There are 18136 sugar grains in a teaspoon. How many grains will be present in 671 teaspoons?

Teacher Reference: Workbook

Chapter 5: Multiplication



Practice Questions

- | | | |
|--|-------------------------------|------------|
| 1) 541 | 2) 0 | |
| 3) 30328 | 4) a) 25416 b) 9446 | c) 3594 |
| 5) 56736 | 6) a) 206073 b) 29986 | c) 39423 |
| 7) a) 192040 b) 126120 c) 782300 | 8) 7 digits | |
| 9) 0 | 10) a) 1782528 b) 647632 | c) 1729104 |
| 11) 755307 | 12) $0 + 0 = 0$ | |
| 13) 16342337 | 14) a) 47075321 b) 1233321 | c) 739926 |
| 15) 123321 | 16) a) 566196 b) 301106 | c) 865431 |
| 17) 1955536 | 18) 1284602 | |
| 19) 6, 3 | 20) 3200 | |
| 21) ₹ 113651 | 22) 3893199 pages | |
| 23) 8590720 beans | 24) 45540 pieces | |
| 25) 4153284 litres | 26) 448685 balls | |
| 27) 9928728 pieces | 28) 856408 oranges | |
| 29) 33046443 metres | 30) 12169256 grains | |

A – Curriculum to Learning Objectives: Division

Prior Knowledge		• Number sense, number operations				
Class	Ch. No.	Chapter Name	C. No.	Concept Name	L. Obj. No.	Learning Objectives
1	5	Subtraction	5.1	Subtract 1-digit and 2-digit Numbers	5.1.a	• different methods of subtracting numbers
					5.1.b	• subtracting numbers up to 99 without regrouping
2	5	Subtraction	5.1	Subtract 2-digit and 3-digit Numbers	5.1.a	• subtracting 2-digit and 3-digit numbers
					5.1.b	• properties of subtraction
			5.2	Subtract Two 1-digit Numbers Mentally	5.2.a	• mental maths techniques for subtraction
3	5	Subtraction	5.1	Estimate the Difference between Two Numbers	5.1.a	• rounding off numbers
					5.1.b	• estimating the difference between numbers
			5.2	Subtract 3-digit and 4-digit Numbers	5.2.a	• subtracting 4-digit numbers with and without regrouping
			5.3	Subtract 2-digit Numbers Mentally	5.3.a	• subtract 2-digit Numbers Mentally with and without regrouping
4	7	Division	7.1	Divide Large Numbers	7.1.a	• dividing 4-digit numbers by 1-digit and 2-digit numbers
					7.1.b	• dividing 3-digit numbers by 2-digit numbers
					7.1.c	• properties of division
5	6	Division	6.1	Divide Large Numbers	6.1.a	• dividing 5-digit by 1-digit and 2-digit numbers.
					6.1.b	• rules of divisibility
			6.2	Factors and Multiples	6.2.a	• finding prime and composite numbers.
					6.2.b	• factors, multiples, H.C.F. and L.C.M. of numbers.
			6.3	H.C.F. and L.C.M.	6.3.a	• finding HCF and LCM using prime factorisation of numbers.

B – Vision-to-Action Plan: 6.1 Divide Large Numbers

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
1 DD/MM/YYYY	57 – THK, RCL	6.1.a	<ul style="list-style-type: none"> Identify the divisor, dividend, quotient and remainder. 	<ul style="list-style-type: none"> Questioning 	–	WB: Pg. 57 (Q. 4-6)	WB: Pg. 57 (Q. 1-3)	
2 DD/MM/YYYY	58 – REM/UND	6.1.a	<ul style="list-style-type: none"> Demonstrate the steps to be followed while dividing 4-digit and 5-digit numbers by 1-digit numbers. 	<ul style="list-style-type: none"> Direct Instruction 	–	TB: Pg.58 (Examples 1, 2) WB: Pgs. 57, 58 (Q. 7-10)	WB: Pg. 58 (Q. 11, 12)	
3 DD/MM/YYYY	59, 60 – REM/UND	6.1.a	<ul style="list-style-type: none"> Understand the steps to be followed to check the correctness of division. 	<ul style="list-style-type: none"> Guided Learning 	–	WB: Pg. 58 (Q. 13)	WB: Pgs. 58, 59 (Q. 14)	
4 DD/MM/YYYY	60, 61 – APP	6.1.a	<ul style="list-style-type: none"> Practise division and check its correctness. 	<ul style="list-style-type: none"> Interactive Discussion 	–	TB: Pgs. 60, 61 (Examples 3, 4) WB: Pg. 58 (Q. 15)	WB: Pgs. 58, 59 (Q. 16)	
5 DD/MM/YYYY	61 – APP	6.1.a	<ul style="list-style-type: none"> Demonstrate the division of a 5-digit number by a 2-digit number. 	<ul style="list-style-type: none"> Peer Learning 	–	WB: Pgs. 59, 60 (Q. 17, 19)	WB: Pgs. 60, 61 (Q. 18, 20)	

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
6 DD/MM/YYYY	61, 62 – APP	6.1.b	<ul style="list-style-type: none"> Understand and apply the rules of divisibility. 	<ul style="list-style-type: none"> Guided Learning Direct Instruction 	–	TB: Pgs. 61, 62 (Examples 5, 6)	–	
7 DD/MM/YYYY	62, 63, 73 – HOTS, Drill Time	6.1.c	<ul style="list-style-type: none"> Implement large number division in real-life situations. 	<ul style="list-style-type: none"> Interactive Discussion 	–	TB: Pgs. 62, 63 (Examples 7, 8) TB: Pg. 73 (Drill Time Q. 1,2) WB: Pg. 61 (Q. 22)	WB: Pg. 62 (Q. 21)	

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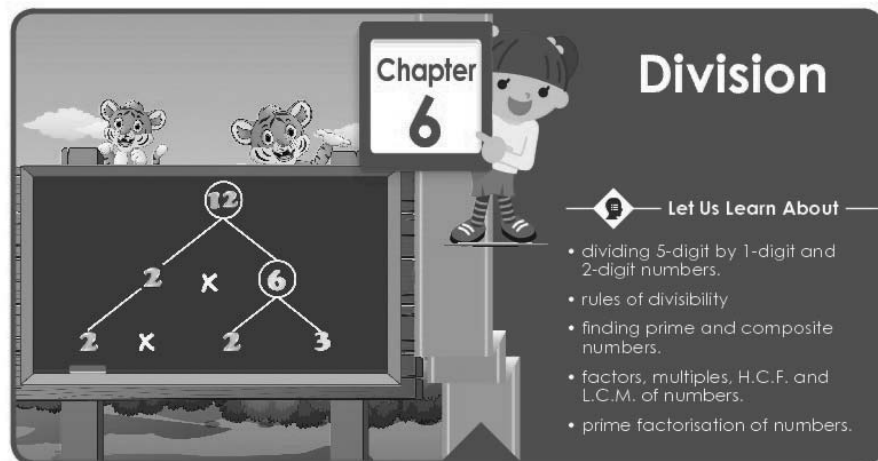
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Important Words

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Chapter 6 Division

Let Us Learn About

- dividing 5-digit by 1-digit and 2-digit numbers.
- rules of divisibility
- finding prime and composite numbers.
- factors, multiples, H.C.F. and L.C.M. of numbers.
- prime factorisation of numbers.

The graphic shows a girl holding a sign for Chapter 6. A tree diagram illustrates the relationship between numbers: 12 is at the top, branching down to 2 and 6, which then branch down to 2 and 3 respectively. Multiplication signs (x) are placed between the numbers in the branches.

Concept 6.1: Divide Large Numbers



Think

Pooja's brother saved ₹ 12500 in two years. He saved an equal amount every month. Pooja wanted to find his savings per month. How do you think Pooja can find that?



Recall

In Class 4, we have learnt dividing a 4-digit number by a 1-digit number.

Let us now revise this concept with a few examples.

Divide: a) $3165 \div 3$ b) $5438 \div 6$ c) $2947 \div 7$ d) $7288 \div 4$ e) $1085 \div 5$

Transactional Tip(s)

Duration: 29 min



Questioning:

- Randomly ask learners to answer the questions given in TB Pg. 58, 'Recall'.
- Ask learners to divide the numbers in their notebooks and identify the divisor, dividend, quotient and remainder for each division problem.
- Solve and discuss WB: Pg. 57, Q. 1-3.

Class Pulse Check

Duration: 1 min



- 1) Divide 2403 by 3.

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Remembering and Understanding

Dividing a 5-digit number by a 1-digit number is the same as dividing a 4-digit number by a 1-digit number.

Example 1: Divide: a) $12465 \div 5$

b) $76528 \div 4$

Solution:

$$\begin{array}{r} \text{a)} \quad \begin{array}{r} 2493 \\ 5 \overline{) 12465} \\ \underline{-10} \\ 24 \\ \underline{-20} \\ 46 \\ \underline{-45} \\ 15 \\ \underline{-15} \\ 0 \end{array} \end{array}$$

$$\begin{array}{r} \text{b)} \quad \begin{array}{r} 19132 \\ 4 \overline{) 76528} \\ \underline{-4} \\ 36 \\ \underline{-36} \\ 05 \\ \underline{-04} \\ 12 \\ \underline{-12} \\ 08 \\ \underline{-8} \\ 0 \end{array} \end{array}$$

Let us now divide a 5-digit number by a 2-digit numbers.

Example 2: Divide: $21809 \div 14$

Solution: Write the dividend and the divisor as Divisor $\overline{) \text{Dividend}}$

Steps	Solved	Solve these
Step 1: Guess the quotient by dividing the two leftmost digits by the divisor. Find the multiplication fact which has the dividend and the divisor.	$14 \overline{) 21809}$ $14 \times 1 = 14$ $14 \times 2 = 28$ $14 < 21 < 28$ So, 14 is the number to be subtracted from 21.	$20 \overline{) 53174}$ _____ _____ _____ _____ _____

Important Words

Duration: 1 min

- **Today:** dividend, divisor

Transactional Tip(s)

Duration: 28 min



Direct Instruction:

- Explain the step-by-step division of a 4-digit number by a 1-digit number. Use TB: Pg. 58, Examples 1, 2.
- Explain why the remainder should always be less than the divisor by citing examples.
- Explain how to check the correctness of division using the same example.
- Solve and discuss WB: Pgs. 57, 58, Q. 7-10.

Class Pulse Check

Duration: 1 min



- 1) Divide 4590 by 4?

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Steps	Solved	Solve these
Step 2: Write the factor other than the dividend and the divisor as the quotient.	Write 1 in the quotient and 14 below 21, and subtract. Then bring down the next number in the dividend. $\begin{array}{r} 1 \\ 14 \overline{) 21809} \\ \underline{-14} \\ 78 \end{array}$	$13 \overline{) 34567}$ _____ _____ _____ _____ _____
Step 3: Repeat steps 1 and 2 until all the digits of the dividend are brought down. Stop the division when the remainder < divisor.	$\begin{array}{r} 1557 \\ 14 \overline{) 21809} \\ \underline{-14} \\ 78 \\ \underline{-70} \\ 80 \\ \underline{-70} \\ 109 \\ \underline{-98} \\ 11 \end{array}$	$15 \overline{) 45675}$ _____ _____ _____ _____ _____
Step 4: Write the quotient and the remainder. The remainder must always be less than the divisor.	Quotient = 1557 Remainder = 11	_____ _____

Checking for the correctness of division:

We can check if our division is correct using a multiplication fact of the division.

Step 1: Compare the remainder and the divisor.

Step 2: Check if (Quotient × Divisor) + Remainder = Dividend

Important Words

Duration: 1 min

- **Last class:** dividend, divisor
- **Today:** quotient, remainder, correctness

Transactional Tip(s)

Duration: 28 min



Guided Learning:

- Explain the step-by-step procedure to check the correctness of division by using steps shown in TB: Pg. 59.
- Verify the answer by checking the correctness of division.
- Solve and discuss WB: Pg. 5, Q. 13.

Class Pulse Check

Duration: 1 min



- 1) What is the formula to check the correctness of division problem?

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Let us now check if our division in example 2 is correct or not.

Step 1: Remainder < Divisor	Dividend = 21809 Divisor = 14 Quotient = 1557 Remainder = 11 $11 < 14$ (True)
Step 2: (Quotient \times Divisor) + Remainder = Dividend	$1557 \times 14 + 11 = 21809$ $21798 + 11 = 21809$ $21809 = 21809$ (True)

- Note:**
- 1) If remainder > divisor, the division is incorrect.
 - 2) If (Quotient \times Divisor) + Remainder is not equal to Dividend, the division is incorrect.



Application

Let us now see a few real-life examples of division of large numbers.

Example 3: A machine produces 48660 pens in the month of June. How many pens does it produce in a day?

Solution:

Number of days in the month of June = 30

Number of pens produced in the month = 48660

Number of pens produced in a day = $48660 \div 30$

$$\begin{array}{r} 1622 \\ 30 \overline{) 48660} \\ \underline{- 30} \\ 186 \\ \underline{- 180} \\ 66 \\ \underline{- 60} \\ 60 \\ \underline{- 60} \\ 00 \end{array}$$

Therefore, the machine produces 1622 pens in a day.

Important Words

- **Last class:** quotient, remainder, correctness
- **Today:** –

Transactional Tip(s)

Duration: 28 min



Interactive Discussion:

- Discuss and solve TB: Pgs. 60, 61, Examples 3, 4.
- Check for understanding of every step.
- Discuss the answers and ask learners to explain the steps followed in arriving at the answer and checking for correctness.
- Solve and discuss WB: Pg. 58, Q. 15.

Class Pulse Check

Duration: 1 min



- 1) Can the remainder be more than the dividend?

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Important Words

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Example 4: Vijay bought 15375 sheets of paper for 35 students of his class. If the sheets are distributed equally, how many sheets would each student get? Will any sheets remain?

Solution: Total number of sheets = 15375
Number of students = 35
Number of sheets each student gets = $15375 \div 35$
Therefore, the number of sheets each student gets = 439
Number of sheets that remain = 10

$$\begin{array}{r} 439 \\ 35 \overline{) 15375} \\ \underline{-140} \\ 137 \\ \underline{-105} \\ 325 \\ \underline{-315} \\ 10 \end{array}$$

Rules of divisibility

Divisibility rules help us to find the numbers that divide a given number exactly. By using them, we can find the factors of a number, without actually dividing it.

Divisor	Rule	Examples
2	The ones digit of the given number must be 0, 2, 4, 6 or 8.	10, 42, 56, 48, 24
3	The sum of the digits of the given number must be divisible by 3.	36 (3 + 6 = 9) 48 (4 + 8 = 12)
4	The number formed by the last two digits of the given number must be divisible by 4 or both the digits must be zero.	1400, 3364, 2500, 7204
5	The ones digit of the given number must be 0 or 5.	230, 375, 100, 25
6	The number must be divisible by both 2 and 3.	36, 480, 1200
9	The sum of the digits of the given number must be divisible by 9.	36 (3 + 6 = 9) 144 (1 + 4 + 4 = 9)
10	The ones digit of the given number must be 0.	300, 250, 5670

Let us now apply the divisibility rules to check if a given number is divisible by 2, 3, 4, 5, 6, 9 or 10.

Example 5: Which of the numbers 2, 3, 4, 5, 6, 9 and 10 divide 42670?

Solution: To check if 2, 3, 4, 5, 6, 9 or 10 divide 42670, apply their divisibility rules.

Divisibility by 2: The ones place of 42670 has 0. So, it is divisible by 2.

Divisibility by 3: The sum of the digits of 42670 is $4 + 2 + 6 + 7 + 0 = 19$. 19 is not divisible by 3. So, 42670 is not divisible by 3.

Transactional Tip(s)

Duration: 29 min



Peer Learning - Pair/Group:

- Make groups of two learners and ask the groups to:
 - frame a word problem on division,
 - interchange the problems with the neighbouring groups and ask learners to solve them in their peer groups.
 - discuss if anyone has difficulty in understanding the activity. Discuss the solutions with the learners
- Solve and discuss WB: Pgs. 59, 60, Q. 17, 19.

Class Pulse Check

Duration: 1 min



- 1) Is the number 43 divisible by 2?

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Divisibility by 4: The number formed by the digits in the last two places of 42670 is 70, which is not exactly divisible by 4. So, 42670 is not divisible by 4.

Divisibility by 5: The ones place of 42670 has 0. So, it is divisible by 5.

Divisibility by 6: 42670 is divisible by 2 but not by 3. So, it is not divisible by 6.

Divisibility by 9: The sum of the digits of 42670 is $4 + 2 + 6 + 7 + 0 = 19$, which is not divisible by 9. So, 42670 is not divisible by 9.

Divisibility by 10: The ones place of 42670 has 0. So, it is divisible by 10.
Hence, the numbers that divide 42670 are 2, 5, and 10.

Example 6: Complete this table.

Number	Divisible by						
	2	3	4	5	6	9	10
464							
390							
3080							
4500							

Solution: Apply the divisibility rules to check if the given numbers are divisible by the given factors.

Number	Divisible by						
	2	3	4	5	6	9	10
464	✓	✗	✓	✗	✗	✗	✗
390	✓	✓	✗	✓	✓	✗	✓
3080	✓	✗	✓	✓	✗	✗	✓
4500	✓	✓	✓	✓	✓	✓	✓



Higher Order Thinking Skills (H.O.T.S.)

Let us see a few examples where we use the of divisibility rules in some real-life situations.

Example 7: In a nursery, there are 4056 plants. How many can be planted in each row, if there are 2, 3, 4, 5, 6, 9 or 10 rows? Will some plants be left over in any of the arrangements?

Solution: Number of plants in the nursery = 4056
4056 is divisible exactly by:

Important Words

Duration: 1 min

- **Today:** divisibility

Transactional Tip(s)

Duration: 28 min



Guided Learning:

- Summarise the rule of divisibility by randomly questioning the learners.
- Demonstrate all the rules of divisibility on the blackboard with TB: Pg. 61, 62, Examples 5, 6.

Direct Instruction:

- Ask each learner to form two 5-digit numbers from the digits 3, 8, 1, 0, 7, 2 and 9 and find their divisibility by 2, 3, 4, 5, 6, 9, 10 and 11.

Class Pulse Check

Duration: 1 min



- 1) Will a number be divisible by another number if the remainder is greater than zero?

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2 (since the ones digit is 6),

3 (since $4 + 0 + 5 + 6 = 15$),

4 (since 56 is divisible by 4) and 6 (since 4056 is divisible by 2 and 3).

So, we can arrange 4056 plants in rows of 2, 3, 4 or 6.

Since 4056 is not exactly divisible by 5, 9 and 10, some plants remain if they are arranged in 5, 9 or 10 rows.

Example 8: Dilip shares 350 stamps with his friends. If he gives 2, 3, 5 or 10 stamps to each friend, will all the stamps be shared?

Solution: Number of stamps Dilip shares = 350

If Dilip shares 2, 5 or 10 stamps each, all the stamps will be distributed as 2, 5 and 10 divide 350 exactly.

If he gives 3 stamps to each of his friends, some stamps remain as 350 is not exactly divisible by 3.

Concept 6.2: Factors and Multiples



Think

Pooja learnt to find factors of a given number using multiplication and division. She wants to know the name given to the product obtained when we multiply numbers by counting. Do you know the name given to such products?



Recall

The numbers that divide a given number exactly are called the **factors** of that number.

In other words, the numbers, which when multiplied, give a product are called the **factors of the product**.

For example, in $12 \times 9 = 108$, the numbers 12 and 9 are called the factors of 108. The number 108 is called the product of 12 and 9.

Important Words

- **Last class:** divisibility
- **Today:** –

Transactional Tip(s)

Duration: 29 min



Interactive Discussion:

- Ask learners to individually solve TB: Pg. 62, 63 Examples 7, 8 using the rules of divisibility learnt in this chapter.
- Discuss the results with the learners and ask the partners to help each other arrive at the result.
- Solve and discuss :
 - TB: Pg. 73, 'Drill Time', Q. 1, 2,
 - WB: Pg. 61, Q. 22.

Class Pulse Check

1) -



B – Vision-to-Action Plan: 6.1 Divide Large Numbers

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
1 DD/MM/YYYY	57 – THK, RCL	6.1.a	<ul style="list-style-type: none"> Identify the divisor, dividend, quotient and remainder. 	<ul style="list-style-type: none"> Questioning 	–	WB: Pg. 57 (Q. 4-6)	WB: Pg. 57 (Q. 1-3)	
2 DD/MM/YYYY	58 – REM/UND	6.1.a	<ul style="list-style-type: none"> Demonstrate the steps to be followed while dividing 4-digit and 5-digit numbers by 1-digit numbers. 	<ul style="list-style-type: none"> Direct Instruction 	–	TB: Pg.58 (Examples 1, 2) WB: Pgs. 57, 58 (Q. 7-10)	WB: Pg. 58 (Q. 11, 12)	
3 DD/MM/YYYY	59, 60 – REM/UND	6.1.a	<ul style="list-style-type: none"> Understand the steps to be followed to check the correctness of division. 	<ul style="list-style-type: none"> Guided Learning 	–	WB: Pg. 58 (Q. 13)	WB: Pgs. 58, 59 (Q. 14)	
4 DD/MM/YYYY	60, 61 – APP	6.1.a	<ul style="list-style-type: none"> Practise division and check its correctness. 	<ul style="list-style-type: none"> Interactive Discussion 	–	TB: Pgs. 60, 61 (Examples 3, 4) WB: Pg. 58 (Q. 15)	WB: Pgs. 58, 59 (Q. 16)	
5 DD/MM/YYYY	61 – APP	6.1.a	<ul style="list-style-type: none"> Demonstrate the division of a 5-digit number by a 2-digit number. 	<ul style="list-style-type: none"> Peer Learning 	–	WB: Pgs. 59, 60 (Q. 17, 19)	WB: Pgs. 60, 61 (Q. 18, 20)	

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
6 DD/MM/YYYY	61, 62 – APP	6.1.b	<ul style="list-style-type: none"> Understand and apply the rules of divisibility. 	<ul style="list-style-type: none"> Guided Learning Direct Instruction 	–	TB: Pgs. 61, 62 (Examples 5, 6)	–	
7 DD/MM/YYYY	62, 63, 73 – HOTS, Drill Time	6.1.c	<ul style="list-style-type: none"> Implement large number division in real-life situations. 	<ul style="list-style-type: none"> Interactive Discussion 	–	TB: Pgs. 62, 63 (Examples 7, 8) TB: Pg. 73 (Drill Time Q. 1,2) WB: Pg. 61 (Q. 22)	WB: Pg. 62 (Q. 21)	

A – Curriculum to Learning Objectives: Division

Prior Knowledge		• Number sense, number operation				
Class	Ch. No.	Chapter Name	C. No.	Concept Name	L. Obj. No.	Learning Objectives
1	5	Subtraction	5.1	Subtract 1-digit and 2-digit Numbers	5.1.a	• different methods of subtracting numbers
					5.1.b	• subtracting numbers up to 99 without regrouping
2	5	Subtraction	5.1	Subtract 2-digit and 3-digit Numbers	5.1.a	• subtracting 2-digit and 3-digit numbers
					5.1.b	• properties of subtraction
			5.2	Subtract Two 1-digit Numbers Mentally	5.2.a	• mental maths techniques for subtraction
3	5	Subtraction	5.1	Estimate the Difference between Two Numbers	5.1.a	• rounding off numbers
					5.1.b	• estimating the difference between numbers
			5.2	Subtract 3-digit and 4-digit Numbers	5.2.a	• subtracting 4-digit numbers with and without regrouping
			5.3	Subtract 2-digit Numbers Mentally	5.3.a	• subtract 2-digit Numbers Mentally with and without regrouping
4	7	Division	7.1	Divide Large Numbers	7.1.a	• dividing 4-digit numbers by 1-digit and 2-digit numbers
					7.1.b	• dividing 3-digit numbers by 2-digit numbers
					7.1.c	• properties of division
5	6	Division	6.1	Divide Large Numbers	6.1.a	• dividing 5-digit by 1-digit and 2-digit numbers.
					6.1.b	• rules of divisibility
			6.2	Factors and Multiples	6.2.a	• finding prime and composite numbers.
					6.2.b	• factors, multiples, H.C.F. and L.C.M. of numbers.
			6.3	H.C.F. and L.C.M.	6.3.a	• finding HCF and LCM using prime factorisation of numbers.

A – Curriculum to Learning Objectives: Division

Prior Knowledge		• Number sense, number operation				
Class	Ch. No.	Chapter Name	C. No.	Concept Name	L. Obj. No.	Learning Objectives
1	5	Subtraction	5.1	Subtract 1-digit and 2-digit Numbers	5.1.a	• different methods of subtracting numbers
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					5.1.b	• properties of subtraction
			5.2	Subtract Two 1-digit Numbers Mentally	5.2.a	• mental maths techniques for subtraction
3	5	Subtraction	5.1	Estimate the Difference between Two Numbers	5.1.a	• rounding off numbers
					5.1.b	• estimating the difference between numbers
			5.2	Subtract 3-digit and 4-digit Numbers	5.2.a	• subtracting 4-digit numbers with and without regrouping
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4	7	Division	7.1	Divide Large Numbers	7.1.a	• dividing 4-digit numbers by 1-digit and 2-digit numbers
					7.1.b	• dividing 3-digit numbers by 2-digit numbers
					7.1.c	• properties of division
5	6	Division	6.1	Divide Large Numbers	6.1.a	• dividing 5-digit by 1-digit and 2-digit numbers.
					6.1.b	• rules of divisibility
			6.2	Factors and Multiples	6.2.a	• finding prime and composite numbers.
					6.2.b	• factors, multiples, H.C.F. and L.C.M. of numbers.
			6.3	H.C.F. and L.C.M.	6.3.a	• finding HCF and LCM using prime factorisation of numbers.

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2 (since the ones digit is 6),

3 (since $4 + 0 + 5 + 6 = 15$),

4 (since 56 is divisible by 4) and 6 (since 4056 is divisible by 2 and 3).

So, we can arrange 4056 plants in rows of 2, 3, 4 or 6.

Since 4056 is not exactly divisible by 5, 9 and 10, some plants remain if they are arranged in 5, 9 or 10 rows.

Example 8: Dilip shares 350 stamps with his friends. If he gives 2, 3, 5 or 10 stamps to each friend, will all the stamps be shared?

Solution: Number of stamps Dilip shares = 350

If Dilip shares 2, 5 or 10 stamps each, all the stamps will be distributed as 2, 5 and 10 divide 350 exactly.

If he gives 3 stamps to each of his friends, some stamps remain as 350 is not exactly divisible by 3.

Concept 6.2: Factors and Multiples



Think

Pooja learnt to find factors of a given number using multiplication and division. She wants to know the name given to the product obtained when we multiply numbers by counting.

Do you know the name given to such products?



Recall

The numbers that divide a given number exactly are called the **factors** of that number.

In other words, the numbers, which when multiplied, give a product are called the **factors of the product**.

For example, in $12 \times 9 = 108$, the numbers 12 and 9 are called the factors of 108. The number 108 is called the product of 12 and 9.

Important Words

Duration: 1 min

- **Today:** factors, factors of the product

Transactional Tip(s)

Duration: 28 min



Activity Method:

- Ask learners to recall the multiplication table of 8.
- Now ask them to give ten multiples of 2 and then 5.
- Explain rules for the activity by saying that students who have multiples of 4 as their roll number shall stand up and do jazzy hands.
- Learners who fail to stand instantly are out of the game.
- Next, instruct learners who have multiples of 4 as their roll numbers shall stand up and jump in their places.
- Thereafter, learners who have multiples of 3 shall stand up shall do jumping jack.
- Repeat the same steps above for different numbers and conclude by discussing and recalling multiples of a number.
- Recall and summarise about factors by randomly asking factors of various numbers.
- Solve and discuss WB: Pg. 62, Q. 1-3.

Class Pulse Check

Duration: 1 min



- 1) Give five multiples of 4.

Complete the multiplication table of 8.

$8 \times 1 = 8$	$8 \times 2 =$	$8 \times 3 =$	$8 \times 4 =$	$8 \times 5 = 40$
$8 \times 6 = 48$	$8 \times 7 =$	$8 \times 8 = 64$	$8 \times 9 =$	$8 \times 10 =$



Remembering and Understanding

The products obtained when a number is multiplied by 1, 2, 3, 4, 5 are called the **multiples of that number**. In a multiplication table, a number is multiplied by the numbers 1, 2, 3, 4, 5 and so on till 10. In the multiplication table of 8, the products obtained are 8, 16, 24, 32, 40 and so on till 80. These are called the first ten multiples of 8.

Similarly,

- 2, 4, 6, 8, 10, 12 ... are the multiples of 2.
- 5, 10, 15, 20, 25, 30... are the multiples of 5.

Let us now find the factors of some numbers.

Factors of numbers from 1 to 10:

Number	Factors	Number of factors
1	1	1
2	1, 2	2
3	1, 3	2
4	1, 2, 4	3
5	1, 5	2

Number	Factors	Number of factors
6	1, 2, 3, 6	4
7	1, 7	2
8	1, 2, 4, 8	4
9	1, 3, 9	3
10	1, 2, 5, 10	4

From the given table, we observe that:

- The number 1 has only one factor.
- The numbers 2, 3, 5 and 7 have only two factors (1 and themselves)
- The numbers 4, 6, 8, 9 and 10 have three or four factors (more than two factors).

Note: 1) The numbers that have only two factors (1 and themselves) are called **prime numbers**

2) The numbers that have more than two factors are called **composite numbers**.

3) The number 1 has only one factor. So, it is neither prime nor composite.

Important Words

Duration: 1 min

- Last class:** factors, factors of the product
- Today:** multiples, prime, composite

Transactional Tip(s)

Duration: 28 min



Interactive Discussion:

- Now explain to them, the concept of factors and how to find the factors of a number.
- Ask them to find the factors of 1.
- Ask learners to find the factors of 2, 3, 5 and 7.
- Using their answers, explain the concept of prime numbers and composite numbers.
- Ask learners to solve WB: Pg. 62, Q. 7, 8 and discuss the solution.

Class Pulse Check

Duration: 1 min



- What are the factors of 66?

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Sieve of Eratosthenes

Eratosthenes was a Greek mathematician. He created the sieve of Eratosthenes, to find prime numbers between any two given numbers.

Steps to find prime numbers between 1 and 100 using the sieve of Eratosthenes:

Step 1: Prepare a grid of numbers from 1 to 100.

Step 2: Cross out 1 as it is neither prime nor composite.

Step 3: Circle 2 as it is the first prime number. Then cross out all the multiples of 2.

Step 4: Circle 3 as it is the next prime number. Then cross out all the multiples of 3.

Step 5: Circle 5 as it is the next prime number. Then cross out all the multiples of 5.

Step 6: Circle 7 as it is the next prime number. Then cross out all the multiples of 7.

Continue this process till all the numbers between 1 and 100 are either circled or crossed out.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

The circled numbers are the prime numbers and the crossed out numbers are the composite numbers.

Important Words

Duration: 1 min

- **Last class:** multiples, prime, composite
- **Today:** Sieve of Eratosthenes, grid

Transactional Tip(s)

Duration: 13 min



Peer Learning - Pair/Group:

- Demonstrate and describe step-by-step method to use the Sieve of Eratosthenes in order to identify prime numbers as mentioned in TB: Pg. 65.
- Divide the class in groups of four learners, each group will go through the steps to find prime numbers and composite numbers.
- Ask them to discuss among themselves and understand the solution with mutual help.
- Solve and discuss WB: Pg. 62, Q. 9-13, 16.

Class Pulse Check

Duration: 1 min



- 1) Prove that 101 is a prime number.

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There are 25 prime numbers between 1 and 100. These are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89 and 97.

Note: 1) All prime numbers (except 2) are odd.

2) 2 is the only even prime number.

Example 9: Find the factors: a) 16 b) 40

Solution: a) To find the factors of a given number, express it as a product of two numbers as shown: $16 = 1 \times 16$

$$= 2 \times 8$$

$$= 4 \times 4$$

Then write each factor only once.

So, the factors of 16 are 1, 2, 4, 8 and 16.

$$\text{b) } 40 = 1 \times 40$$

$$= 2 \times 20$$

$$= 4 \times 10$$

$$= 5 \times 8$$

So, the factors of 40 are 1, 2, 4, 5, 8, 10, 20 and 40.

Example 10: Find the common factors of 10 and 15.

Solution: $10 = 1 \times 10$ and $10 = 2 \times 5$

So, the factors of 10 are 1, 2, 5 and 10.

$$15 = 1 \times 15 \text{ and } 15 = 3 \times 5$$

So, the factors of 15 are 1, 3, 5 and 15.

Therefore, the common factors of 10 and 15 are 1 and 5.

We can find the factors of a number by multiplication or by division.

Example 11: Find the factors of 30.

Solution: Factors of 30

Using multiplication

$$1 \times 30 = 30$$

$$2 \times 15 = 30$$

$$3 \times 10 = 30$$

Important Words

Duration: 1 min

–

Transactional Tip(s)

Duration: 13 min



Practising:

- Write TB: Pg. 66, Q. 9-11 on the blackboard and ask learners to solve the problems independently.
- Supervise the learners if required, so that there is no confusion in understanding the concept.
- Solve and discuss WB: Pg. 62, Q. 9-13, 16.

Class Pulse Check

Duration: 1 min



1) Find the factors of 50.

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$$5 \times 6 = 30$$

The numbers multiplied to obtain the given number as the product are called its factors.

So, the factors of 30 are 1, 2, 3, 5, 6, 10, 15 and 30.

Using division

$$30 \div 1 = 30$$

$$30 \div 2 = 15$$

$$30 \div 3 = 10$$

$$30 \div 5 = 6$$

The different quotients and divisors of the given number are its factors.

So, the factors of 30 are 1, 2, 3, 5, 6, 10, 15 and 30.

Facts on Factors

- 1) 1 is the smallest factor of a number.
- 2) 1 is a factor of every number.
- 3) A number is the greatest factor of itself.
- 4) Every number is a factor of itself.
- 5) The factor of a number is less than or equal to the number itself.
- 6) Every number (other than 1) has at least two factors – 1 and the number itself.
- 7) The number of factors of a number is limited.

Let us now find the multiples of some numbers.

Example 12: Find the first six multiples: a) 9 b) 15 c) 20

Solution: The first six multiples of a number are the products when the number is multiplied by 1, 2, 3, 4, 5 and 6.

$$\text{a) } 1 \times 9 = 9, 2 \times 9 = 18, 3 \times 9 = 27, 4 \times 9 = 36, 5 \times 9 = 45, 6 \times 9 = 54.$$

So, the first six multiples of 9 are 9, 18, 27, 36, 45 and 54.

Now, complete these:

$$\begin{aligned} \text{b) } 1 \times 15 &= 15, \quad \underline{\quad} \times \underline{\quad} = \underline{\quad}, \quad \underline{\quad} \times \underline{\quad} = \underline{\quad}, \quad \underline{\quad} \times \underline{\quad} \\ &= \underline{\quad}, \quad \underline{\quad} \times \underline{\quad} = \underline{\quad}, \quad \underline{\quad} \times \underline{\quad} = \underline{\quad}. \end{aligned}$$

So, the first six multiples of 15 are , , , , and .

Important Words

- **Last class:** Sieve of Eratosthenes, grid
- **Today:** –

Transactional Tip(s)

Duration: 29 min



Interactive Discussion:

- Discuss the Facts on Factors mentioned in TB: Pg. 67.
- Ask the learners to explain the concepts to the class using TB: Pg. 67, Example 12.
- Solve and discuss TB: Pg. 67, Example 13.

Class Pulse Check

Duration: 1 min



- 1) Are all prime numbers even or odd?

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c) $1 \times 20 = 20$, $__ \times __ = __$, $__ \times __ = __$, $__ \times __ = __$, $__ \times __ = __$
 $= __$, $__ \times __ = __$.

So, the first six multiples of 20 are $__$, $__$, $__$, $__$, $__$ and $__$.

Example 13: Find three common multiples of 10 and 15.

Solution: Multiples of 10 are 10, 20, **30**, 40, 50, **60**, 70, 80, **90**, 100,....

Multiples of 15 are 15, **30**, 45, **60**, 75, **90**, 105,....

Therefore, the first three common multiples of 10 and 15 are 30, 60 and 90.

Facts on Multiples

- 1) Every number is a multiple of itself.
- 2) Every number is a multiple of 1.
- 3) A number is the smallest multiple of itself.
- 4) The multiples of a number are greater than or equal to the number itself.
- 5) The number of multiples of a given number is unlimited.
- 6) The largest multiple of a number cannot be determined.



Application

Finding factors and multiples helps us to find the Highest Common Factor (H.C.F.) and the Least Common Multiple (L.C.M.) of the given numbers.

Highest Common Factor (H.C.F.): The highest common factor of two or more numbers is the greatest number that divides the numbers exactly (without leaving a remainder).

Least Common Multiple (L.C.M.): The least common multiple of two or more numbers is the smallest number that can be divided by the numbers exactly (without leaving a remainder).

Example 14: Find the highest common factor of 12 and 18.

Solution: $12 = 1 \times 12$, $12 = 2 \times 6$ and $12 = 3 \times 4$

So, the factors of 12 are **1, 2, 3, 4, 6** and 12.

$18 = 1 \times 18$, $18 = 2 \times 9$ and $18 = 3 \times 6$

So, the factors of 18 are **1, 2, 3, 6, 9** and 18.

The common factors of 12 and 18 are 1, 2, 3 and 6.

Therefore, the highest common factor of 12 and 18 is 6.

Important Words

Duration: 1 min

- **Today:** multiples, highest common factor, lowest common multiple

Transactional Tip(s)

Duration: 28 min



Guided Learning:

- Introduce the concept of H.C.F. and L.C.M. and their abbreviation.
- Show the step-by-step solution of TB: Pg.68, Example 14 on the blackboard to explain how to find the H.C.F. of the given numbers.
- Similarly, explain the step-by-step solution to find the L.C.M. for the given numbers using TB: Pg.69, Example 15.
- Solve and discuss WB: Pg. 64, Q. 17, 19.

Class Pulse Check

Duration: 1 min



- 1) What is the H.C.F. of 11 and 13?

Example 15: Find the least common multiple of 12 and 18.

Solution: The multiples of 12 are 12, 24, **36**, 48, 60, **72**...

The multiples of 18 are 18, **36**, 54, **72**...

The common multiples of 12 and 18 are 36, 72...

Therefore, the least common multiple of 12 and 18 is 36.



Higher Order Thinking Skills (H.O.T.S.)

Let us now complete these tables of H.C.F. and L.C.M. of the given numbers.

Example 16: Complete the H.C.F. table given. Some H.C.F. values are given for you.

Numbers	10	12	18	30
2		2		
3				
12			6	
15				15

Solution:

Numbers	10	12	18	30
2	2	2	2	2
3	1	3	3	3
12	2	12	6	6
15	5	3	3	15

Example 17: Complete the L.C.M. table given. Some L.C.M. values are given for you.

Numbers	10	12	18	30
2			18	
3				
12		12		
15	30			

Solution:

Numbers	10	12	18	30
2	10	12	18	30
3	30	12	18	30
12	60	12	36	60
15	30	60	90	30

Important Words

- **Last class:** multiples, highest common factor, lowest common multiple
- **Today:** –

Transactional Tip(s)

Duration: 29 min



Interactive Discussion:

- Discuss and explain TB: Pg. 69, Examples 16, 17. Ask learners to complete the table with the missing factors and multiples.
- Discuss how to find the factors and multiples.
- Now, ask learners to solve TB: Pg. 70, Example 18 in their notebooks.
- Partners will assess the result and match the answers with the rest of the class.
- Solve and discuss TB: Pg. 73, 'Drill Time', Q. 3-6.

Class Pulse Check

Duration: 1 min



- 1) What are the prime factors of 38?

Example 18: How many prime and composite numbers are there between 35 and 55?

Solution: The prime numbers between 35 and 55 are 37, 41, 43, 47 and 53 which are five in number. There are 19 numbers between 35 and 55, of which five are prime. So, $19 - 5 = 14$ numbers are composite.

Concept 6.3: H.C.F. and L.C.M.



Think

Pooja now knows prime and composite numbers. She wants to know a simple way to find H.C.F. and L.C.M. of two numbers.

Do you know any simple method for the same?



Recall

We have learnt about prime and composite numbers and the definitions of H.C.F. and L.C.M.

We first find the factors of the given numbers. The highest common number among them gives the H.C.F. of the given numbers.

Likewise, we can find the multiples of the given numbers. The least common among them gives the L.C.M. of the given numbers.

Let us revise the concept by finding the common factors of the following pairs of numbers.

a) 12, 9 b) 15, 10 c) 30, 12 d) 24, 16 e) 35, 21 f) 36, 54



Remembering and Understanding

Prime numbers have only 1 and themselves as their factors. Composite numbers have more than two factors. So, composite numbers can be expressed as the products of their prime numbers or composite numbers.

For example, $5 = 1 \times 5$; $20 = 1 \times 20$

$9 = 1 \times 9$, $= 2 \times 10$

$= 3 \times 3$; $= 4 \times 5$

We can express all composite numbers as the products of prime factors.

Important Words

–

Transactional Tip(s)

–



Class Pulse Check

1) –





C – Exit Assessment

	Suggested questions to test the learning objective(s)	Learning objective(s)	Number of learners who answered correctly
1	Calculate the sum of the prime numbers between 17 and 24. (Ans. 42)	Period 1 - factors, multiples, H.C.F. and L.C.M. of numbers	
2	Prove that 11 is a prime number. (Ans. Because it has only two factors: 1 and itself)	Period 2 - factors, multiples, H.C.F. and L.C.M. of numbers	

Post-lesson Reflection						
TB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	WB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
<hr/>						
Enthusiastic participation		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Concept clarity in the classroom		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Concept clarity through the workbook		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

	Handhold Learners	Challenge Learners
Names		
Exam Revision Strategy	Reteach <input type="checkbox"/>	Revise <input type="checkbox"/> Practise <input type="checkbox"/>
App Report	Number _____	Signature _____

A – Curriculum to Learning Objectives: Division

Prior Knowledge		• Number sense, number operations				
Class	Ch. No.	Chapter Name	C. No.	Concept Name	L. Obj. No.	Learning Objectives
1	5	Subtraction	5.1	Subtract 1-digit and 2-digit Numbers	5.1.a	• different methods of subtracting numbers
					5.1.b	• subtracting numbers up to 99 without regrouping
2	5	Subtraction	5.1	Subtract 2-digit and 3-digit Numbers	5.1.a	• subtracting 2-digit and 3-digit numbers
					5.1.b	• properties of subtraction
3	5	Subtraction	5.2	Subtract 3-digit and 4-digit Numbers	5.2.a	• subtracting 4-digit numbers with and without regrouping
			5.3	Subtract 2-digit Numbers Mentally	5.3.a	• subtract 2-digit Numbers Mentally with and without regrouping
4	7	Division	7.1	Divide Large Numbers	7.1.a	• dividing 4-digit numbers by 1-digit and 2-digit numbers
					7.1.b	• dividing 3-digit numbers by 2-digit numbers
					7.1.c	• properties of division
5	6	Division	6.1	Divide Large Numbers	6.1.a	• dividing 5-digit by 1-digit and 2-digit numbers.
					6.1.b	• rules of divisibility
			6.2	Factors and Multiples	6.2.a	• finding prime and composite numbers
					6.2.b	• factors, multiples, H.C.F. and L.C.M. of numbers
			6.3	H.C.F. and L.C.M.	6.3.a	• finding H.C.F. and L.C.M. using prime factorisation of numbers

B – Vision-to-Action Plan: 6.3 H.C.F. and L.C.M.

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
1 DD/MM/YYYY	70 – THK, RCL	6.3.a	<ul style="list-style-type: none"> Recall the rules of divisibility and steps to find multiples and factors. 	<ul style="list-style-type: none"> Questioning 	–	WB: Pg. 66 (Q. 1-3)	–	
2 DD/MM/YYYY	70, 71 – REM/UND	6.3.a	<ul style="list-style-type: none"> Describe steps to find prime factors by using factor tree method. 	<ul style="list-style-type: none"> Guided Learning 	–	TB: Pg. 71 (Example 19) WB: Pg. 66 (Q. 4, 5) WB: Pg. 67 (Q. 7, 8) WB: Pg. 68 (15, 16)	WB: Pg. 66 (Q. 6) WB: Pg. 67 (Q. 9-14)	
3 DD/MM/YYYY	71 – REM/ UND	6.3.a	<ul style="list-style-type: none"> Practise finding prime factors by using factor tree method. 	<ul style="list-style-type: none"> Direct Instruction 	–	TB: Pg. 71 (Example 20)	–	
4 DD/MM/YYYY	72 – APP	6.3.a	<ul style="list-style-type: none"> Find H.C.F. and L.C.M. using prime factorisation method. 	<ul style="list-style-type: none"> Peer Learning 	–	TB: Pg. 72 (Example 21, 22) WB: Pgs. 68, 69 (Q. 17, 19)	WB: Pg. 69 (Q. 18, 20)	
5 DD/MM/YYYY	72 – HOTS	6.3.a	<ul style="list-style-type: none"> Find the H.C.F. and L.C.M. of three numbers. 	<ul style="list-style-type: none"> Interactive Discussion 	–	TB: Pg. 72 (Example 23, 24) WB: Pg. 70 (Q. 22)	WB: Pg. 70 (Q. 21)	

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
6 DD/MM/YYYY	73 – Drill Time	6.3.a	<ul style="list-style-type: none"> Revise the concepts learnt in this chapter. 	<ul style="list-style-type: none"> Practising 	–	TB: Pg. 73 (Drill Time Q. 7-8)		

Example 18: How many prime and composite numbers are there between 35 and 55?

Solution: The prime numbers between 35 and 55 are 37, 41, 43, 47 and 53 which are five in number. There are 19 numbers between 35 and 55, of which five are prime. So, $19 - 5 = 14$ numbers are composite.

Concept 6.3: H.C.F. and L.C.M.



Think

Pooja now knows prime and composite numbers. She wants to know a simple way to find H.C.F. and L.C.M. of two numbers.

Do you know any simple method for the same?



Recall

We have learnt about prime and composite numbers and the definitions of H.C.F. and L.C.M.

We first find the factors of the given numbers. The highest common number among them gives the H.C.F. of the given numbers.

Likewise, we can find the multiples of the given numbers. The least common among them gives the L.C.M. of the given numbers.

Let us revise the concept by finding the common factors of the following pairs of numbers.

a) 12, 9 b) 15, 10 c) 30, 12 d) 24, 16 e) 35, 21 f) 36, 54



Remembering and Understanding

Prime numbers have only 1 and themselves as their factors. Composite numbers have more than two factors. So, composite numbers can be expressed as the products of their prime numbers or composite numbers.

For example, $5 = 1 \times 5$; $20 = 1 \times 20$

$9 = 1 \times 9$, $= 2 \times 10$

$= 3 \times 3$; $= 4 \times 5$

We can express all composite numbers as the products of prime factors.

Important Words

–

Transactional Tip(s)

Duration: 29 min



Questioning:

- Recall all the rules of divisibility. Revise the concept of finding common factors as mentioned in TB: Pg. 70 'Recall' section.
- Ask learners to come forward one by one and explain divisibility of 2, 4, 3, 6, 9, etc. on the blackboard.
- Now, use the example given in the textbook to ask learners to use the rules of divisibility to find the numbers.
- Solve and discuss WB: Pg. 66, Q. 1-3.

Class Pulse Check

Duration: 1 min



1) What are the prime factors of 36?

- **Today:** prime factorise, factorisation

Expressing a number as a product of prime numbers is called prime factorisation.

To prime factorise a number, we use factor trees. Let us see a few examples to understand this better.

Example 19: Prime factorise 36.

Solution: To carry out the prime factorisation of 36, draw a factor tree as shown.

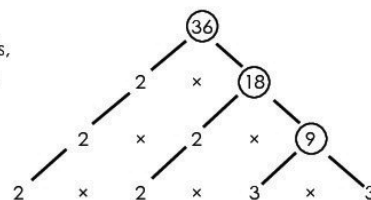
Step 1: Express the given number as a product of two factors. One of these factors is the least number (other than 1) that can divide it. The second factor may be prime or composite.

Step 2: If the second factor is a composite number, express it as a product of two factors. One of these factors is the least number (other than 1) that can divide it. The second factor may be prime or composite.

Step 3: Repeat the process till the factors cannot be split further. In other words, repeat the process till the factors do not have any common factor other than 1.

Step 4: Then write the given number as the product of all the prime numbers.

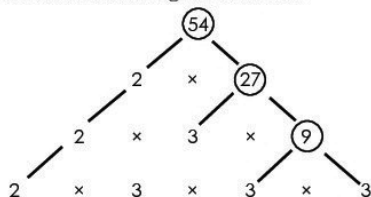
Therefore, the prime factorisation of 36 is $2 \times 2 \times 3 \times 3$.



Note: A factor tree must be drawn using a prime number as one of the factors of the number at each step.

Example 20: Prime factorise 54.

Solution: Prime factorisation of 54 using a factor tree:



Therefore, the prime factorisation of 54 is $2 \times 3 \times 3 \times 3$.

Transactional Tip(s)

Duration: 28 min



Guided Learning:

- Demonstrate TB: Pg. 71, Example 19 and explain the step-by-step approach to find the prime factors of any number by the factor tree method.
- Instruct learners to solve independently WB: Pg. 62, Q. 15, 16.
- Discuss with learners the solution for the same by solving on the blackboard.
- Solve and discuss:
 - WB: Pg. 66, Q. 4, 5,
 - WB: Pg. 67, Q. 7, 8.

Class Pulse Check

Duration: 1 min



- 1) Enlist the prime factors of 41.

- Today: factor tree

Expressing a number as a product of prime numbers is called prime factorisation.

To prime factorise a number, we use factor trees. Let us see a few examples to understand this better.

Example 19: Prime factorise 36.

Solution: To carry out the prime factorisation of 36, draw a factor tree as shown.

Step 1: Express the given number as a product of two factors. One of these factors is the least number (other than 1) that can divide it. The second factor may be prime or composite.

Step 2: If the second factor is a composite number, express it as a product of two factors. One of these factors is the least number (other than 1) that can divide it. The second factor may be prime or composite.

Step 3: Repeat the process till the factors cannot be split further. In other words, repeat the process till the factors do not have any common factor other than 1.

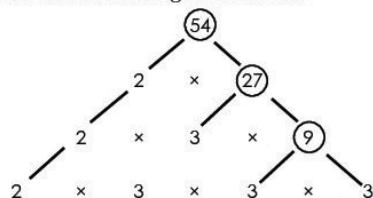
Step 4: Then write the given number as the product of all the prime numbers.

Therefore, the prime factorisation of 36 is $2 \times 2 \times 3 \times 3$.

Note: A factor tree must be drawn using a prime number as one of the factors of the number at each step.

Example 20: Prime factorise 54.

Solution: Prime factorisation of 54 using a factor tree:



Therefore, the prime factorisation of 54 is $2 \times 3 \times 3 \times 3$.

Transactional Tip(s)

Duration: 28 min



Direct Instruction:

- Instruct learners to solve independently: TB: Pg. 71, Example 20 using the factor tree method.
- Discuss with learners the solution for the same by solving on the blackboard.
- Ask learners if they can prime factorise a number using a different method apart from factor tree method.
- Ask learners if they observe any difference when prime factorising a prime number and a composite number.

Class Pulse Check

Duration: 1 min



- 1) Enlist the prime factors of 78.



Application

Finding H.C.F. using prime factorisation

Let us now find the H.C.F. of two numbers using prime factorisation.

Example 21: Find the H.C.F. of 48 and 54 by the prime factorisation method.

Solution: The prime factorisation of 48 is $2 \times 2 \times 2 \times 2 \times 3$.
The prime factorisation of 54 is $2 \times 3 \times 3 \times 3$.
Therefore, the H. C. F of 48 and 54 is 2×3 which is 6.

Finding L.C.M. using prime factorisation

Let us now find the L.C.M. of two numbers using prime factorisation.

Example 22: Find the L.C.M. of 18 and 24 by prime factorisation method.

Solution: Prime factorisation of 18 is $2 \times 3 \times 3$.
Prime factorisation of 24 is $2 \times 2 \times 2 \times 3$.
Therefore, the L.C.M. of 18 and 24 is $2 \times 3 \times 2 \times 2 \times 3 = 72$.



Higher Order Thinking Skills (H.O.T.S.)

Let us now solve a few examples involving the H.C.F. and L.C.M. of three numbers. First, express the numbers as products of prime factors, and then find their H.C.F.

Example 23: Find the H.C.F. of 14, 28 and 35.

Solution: Prime factorisation of 14 is 2×7 .
Prime factorisation of 28 is $2 \times 2 \times 7$.
Prime factorisation of 35 is 5×7 .
Therefore, the H.C.F. of 14, 28 and 35 is 7.

Example 24: Find the L.C.M. of 14, 28 and 35.

Solution: Prime factorisation of 14 is 2×7 .
Prime factorisation of 28 is $2 \times 2 \times 7$.
Prime factorisation of 35 is 5×7 .
Therefore, the L.C.M. of 14, 28 and 35 is $2 \times 2 \times 7 \times 5 = 140$.

Important Words

Duration: 1 min

- **Last class:** prime factorise, factorisation
- **Today:** prime factorisation

Transactional Tip(s)

Duration: 28 min



Peer Learning - Pair/Group:

- Divide the class into two groups. Assign TB: Pg.72, Example 21 to group A and TB: Pg.72, Example 22 to group B.
- Ask learners to discuss the examples among themselves and understand the solution with mutual help.
- Solve and discuss WB: Pg. 68, 69, Q. 17, 19.

Class Pulse Check

Duration: 1 min



- 1) Find the H.C.F. of 26 and 39 using prime factorisation.



Application

Finding H.C.F. using prime factorisation

Let us now find the H.C.F. of two numbers using prime factorisation.

Example 21: Find the H.C.F. of 48 and 54 by the prime factorisation method.

Solution: The prime factorisation of 48 is $2 \times 2 \times 2 \times 2 \times 3$.
The prime factorisation of 54 is $2 \times 3 \times 3 \times 3$.
Therefore, the H. C. F of 48 and 54 is 2×3 which is 6.

Finding L.C.M. using prime factorisation

Let us now find the L.C.M. of two numbers using prime factorisation.

Example 22: Find the L.C.M. of 18 and 24 by prime factorisation method.

Solution: Prime factorisation of 18 is $2 \times 3 \times 3$.
Prime factorisation of 24 is $2 \times 2 \times 2 \times 3$.
Therefore, the L.C.M. of 18 and 24 is $2 \times 3 \times 2 \times 2 \times 3 = 72$.



Higher Order Thinking Skills (H.O.T.S.)

Let us now solve a few examples involving the H.C.F. and L.C.M. of three numbers. First, express the numbers as products of prime factors, and then find their H.C.F.

Example 23: Find the H.C.F. of 14, 28 and 35.

Solution: Prime factorisation of 14 is 2×7 .
Prime factorisation of 28 is $2 \times 2 \times 7$.
Prime factorisation of 35 is 5×7 .
Therefore, the H.C.F. of 14, 28 and 35 is 7.

Example 24: Find the L.C.M. of 14, 28 and 35.

Solution: Prime factorisation of 14 is 2×7 .
Prime factorisation of 28 is $2 \times 2 \times 7$.
Prime factorisation of 35 is 5×7 .
Therefore, the L.C.M. of 14, 28 and 35 is $2 \times 2 \times 7 \times 5 = 140$.

Important Words

- Last class: factor tree
- Today: –

Transactional Tip(s)

Duration: 28 min



Interactive Discussion:

- Solve WB: Pg. 70, Q. 22 on the blackboard.
- Select two learners and assign TB: Pg.72, Example 23 to the first learner and TB: Pg.72, Example 24 to the second learner.
- Ask them to explain the solution of the assigned problems to the rest of the class and try to answer any queries asked by the fellow learners.

Class Pulse Check

Duration: 1 min



- 1) Find the H.C.F. of 26 and 39 using prime factorisation.

Annual Day:
55/61

Day:
6/6

Actual Date:

Page(s)
73



Drill Time

Concept 6.1: Divide Large Numbers

1) Divide:

- a) 43243 by 23 b) 50689 by 14 c) 52043 by 18
d) 21861 by 5 e) 72568 by 4

2) Word problems

- a) Which of the numbers among 2, 3, 4, 5, 6, 9 and 10 divide 893205?
b) Which of the numbers among 2, 3, 4, 5, 6, 9 and 10 divide 24688?

Concept 6.2: Factors and Multiples

3) Find the factors of the following:

- a) 36 b) 49 c) 100 d) 120 e) 91

4) Find the multiples of the following as given in the brackets:

- a) 7 (First 8) b) 15 (First 5) c) 100 (First 10) d) 25 (First 4) e) 30 (First 6)

5) Find the highest common factor of the following pairs of numbers.

- a) 12, 20 b) 15, 27 c) 24, 48 d) 16, 64 e) 30, 45

6) Find the least common multiple of the following pairs of numbers.

- a) 8, 10 b) 12, 15 c) 16, 20 d) 22, 33 e) 15, 30

Concept 6.3: H.C.F. and L.C.M.

7) Prime factorise the following using the factor tree method.

- a) 108 b) 128 c) 56 d) 48 e) 63

8) Solve:

- a) Find the L.C.M. of 32 and 56 by prime factorisation.
b) Find the H.C.F. of 25 and 75 by prime factorisation.
c) Find the H.C.F. of 96 and 108 by prime factorisation.
d) Find the L.C.M. of 45 and 75 by prime factorisation.

Important Words

- Last class: prime factorisation
- Today: –

Transactional Tip(s)

Duration: 27 min



Practising:

- Have learners independently solve TB: Pg. 73, 'Drill Time', Q. 7-8.
- Discuss the solution with learners.

Class Pulse Check

Duration: 2 min



- 1) What will be the H.C.F. and L.C.M of 29 and 31?

Division

73



C – Exit Assessment

	Suggested questions to test the learning objective(s)	Learning objective(s)	Number of learners who answered correctly
1	Expand the terms H.C.F. and L.C.M. (Ans. Highest Common Factor, Least Common Multiple)	Periods 2, 3 - prime factorisation of numbers	
2	The product of the H.C.F. and the L.C.M. of two numbers is 228. If one of the numbers is 12, then find the sum of the two numbers. (Ans. 3)	Periods 2, 3 - prime factorisation of numbers	
3	Find the H.C.F of 162, 126 and 180. (Ans. 18)	Period 3 - prime factorisation of numbers	

Post-lesson Reflection						
TB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	WB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
<hr/>						
Enthusiastic participation		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Concept clarity in the classroom		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Concept clarity through the workbook		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

	Handhold Learners	Challenge Learners
Names		
Exam Revision Strategy	Reteach <input type="checkbox"/>	Revise <input type="checkbox"/> Practise <input type="checkbox"/>
App Report	Number _____	Signature _____

Teacher Reference: Textbook

Chapter 6: Division

Concept 6.1: Divide Large Numbers

Drill Time

1) Divide:

a) $43243 \text{ by } 23 = \text{Quotient} = 1880; \text{Remainder} = 3$

b) $50689 \text{ by } 14 = \text{Quotient} = 3620; \text{Remainder} = 9$

c) $52043 \text{ by } 18 = \text{Quotient} = 2891; \text{Remainder} = 5$

d) $21861 \text{ by } 5 = \text{Quotient} = 4372; \text{Remainder} = 1$

e) $72568 \text{ by } 4 = \text{Quotient} = 18142; \text{Remainder} = 0$

2) Word problems

a) Which of the numbers among 2, 3, 4, 5, 6, 9 and 10 divide 893205?

b) Which of the numbers among 2, 3, 4, 5, 6, 9 and 10 divide 24688?

Solution: a) 3, 5, 9

b) 2, 4

Teacher Reference: Textbook

Chapter 6: Division

Concept 6.2: Factors and Multiples

Drill Time

- 3) Find the factors of the following:
- a) $36 = 1, 2, 3, 4, 6, 9, 12, 18, 36$
 - b) $49 = 1, 7, 49$
 - c) $100 = 1, 2, 4, 5, 10, 20, 25, 50, 100$
 - d) $120 = 1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 24, 30, 40, 60, 120$
 - e) $91 = 1, 7, 13, 91$
- 4) Find the multiples of the following as given in the brackets:
- a) 7 (First 8) = **7, 14, 21, 28, 35, 42, 49, 56**
 - b) 15 (First 5) = **15, 30, 45, 60, 75**
 - c) 100 (First 10) = **100, 200, 300, 400, 500, 600, 700, 800, 900, 1000**
 - d) 25 (First 4) = **25, 50, 75, 100**
 - e) 30 (First 6) = **30, 60, 90, 120, 150, 180**
- 5) Find the highest common factor of the following pairs of numbers.
- a) $12, 20 = 4$
 - b) $15, 27 = 3$
 - c) $24, 48 = 24$
 - d) $16, 64 = 16$
 - e) $30, 45 = 15$
- 6) Find the least common multiple of the following pairs of numbers.
- a) $8, 10 = 40$
 - b) $12, 15 = 60$
 - c) $16, 20 = 80$
 - d) $22, 33 = 66$
 - e) $15, 30 = 30$

Teacher Reference: Textbook

Chapter 6: Division

Concept 6.3: H.C.F. and L.C.M.

7) Prime factorise the following using the factor tree method.

a) $108 = 2 \times 2 \times 3 \times 3 \times 3$

b) $128 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

c) $56 = 2 \times 2 \times 2 \times 7$

d) $48 = 2 \times 2 \times 2 \times 2 \times 3$

e) $63 = 3 \times 3 \times 7$

8) Solve:

a) Find the L.C.M. of 32 and 56 by prime factorisation.

Solution: 224

b) Find the H.C.F. of 25 and 75 by prime factorisation.

Solution: 25

c) Find the H.C.F. of 96 and 108 by prime factorisation.

Solution: 12

d) Find the L.C.M. of 45 and 75 by prime factorisation.

Solution: 225



Division

Concept 6.1: Divide Large Numbers



Recall

Multiple Choice Questions

- 1) The ones digit in the quotient of $1278 \div 9$ is _____. [B]
(A) 5 (B) 2 (C) 4 (D) 1
- 2) The remainder of $2536 \div 1$ is _____. [D]
(A) 8 (B) 4 (C) 1 (D) 0
- 3) The tens digit in the quotient of $2222 \div 2$ is _____. [A]
(A) 1 (B) 4 (C) 2 (D) 6



Remembering and Understanding

Multiple Choice Questions

- 4) The quotient in the division of $3303 \div 3$ is _____. [D]
(A) 1011 (B) 1110 (C) 111 (D) 1101
- 5) Which of these is always correct in a division? [A]
(A) Remainder < Divisor (B) Divisor < Remainder
(C) Dividend < Divisor (D) Remainder > Dividend
- 6) The tens digit in the quotient of $5550 \div 5$ is _____. [C]
(A) 0 (B) 5 (C) 1 (D) 4

Fill in the Blanks

- 7) The remainder of $1505 \div 5$ is _____ 0.
- 8) The quotient of $2000 \div 2$ is _____ 1000.

- 9) The ones digit in the quotient of $2468 \div 2$ is 4.

Very Short Answer Questions

- 10) Find the amount each person gets when ₹ 18953 is divided equally among 18953 members.

Solution: Amount each person gets = ₹ $18953 \div 18953 = ₹ 1$

- 11) What is the equation to check the correctness of division?

Solution: Dividend = (Quotient \times Divisor) + Remainder

- 12) What is the quotient of $27864 \div 0$?

Solution: Division by 0 is not defined.

Short Answer Questions

- 13) What is the quotient of $75148 \div 14$?

Solution:

$$\begin{array}{r} 5367 \\ 14 \overline{) 75148} \\ \underline{-70} \\ 51 \\ \underline{-42} \\ 94 \\ \underline{-84} \\ 108 \\ \underline{-98} \\ 10 \end{array}$$

The required quotient is 5367.

- 14) What is the remainder when 60000 is divided by 5?

Solution:

$$\begin{array}{r} 12000 \\ 5 \overline{) 60000} \\ \underline{-5} \\ 10 \\ \underline{-10} \\ 0000 \end{array}$$

The required remainder is 0.

Long Answer Questions

- 15) Divide 52725 by 22. Check the correctness of the division.

Solution: Dividend = Quotient \times Divisor + Remainder

$$\begin{array}{r} 2396 \\ 22 \overline{) 52725} \\ \underline{- 44} \\ 87 \\ \underline{- 66} \\ 212 \\ \underline{- 198} \\ 145 \\ \underline{- 132} \\ 13 \end{array}$$

$$52725 = 2396 \times 22 + 13$$

$$= 52712 + 13$$

$$= 52725$$

Hence, the division is correct.

16) Divide 80432 by 16. Check the correctness of the division.

Solution:

$$\begin{array}{r} 5027 \\ 16 \overline{) 80432} \\ \underline{- 80} \\ 43 \\ \underline{- 32} \\ 112 \\ \underline{- 112} \\ 0 \end{array}$$

Check:- Dividend = Quotient \times Divisor + Remainder

$$80432 = 5027 \times 16 + 0$$

$$= 80432 + 0$$

$$= 80432$$

Hence, the division is correct.



Application

Short Answer Questions

17) Rohit has 2503 marbles. He wants to divide them in groups of 3 and 6 exactly. Check if he can do so.

Solution:

The number of marbles with Rohit = 2503.....
 We have to check for the divisibility of 2503 by 3 and 6.....
 A number is divisible by 6 if it is divisible by 2 and 3. The ones digit of the given.....
 number is not an even number or 0. Hence, the number 2503 is not divisible by 2.....
 The sum of all the digits of the number = $2 + 5 + 0 + 3 = 10$. 10 is not divisible by 3.....
 Hence, the number 2503 is not divisible by 3.....
 Thus, the number 2503 is not divisible by 3 and 6.....
 Hence, the number of marbles that Rohit has cannot be divided exactly in groups of.....
 3 and 6.....

18) ₹ 7893 is distributed equally among 9 people. Check if any amount is left over.

Solution: Amount distributed = ₹ 7893.....
 Number of persons among which the amount is distributed = 9.....
 Sum of all the digits in the number = $7 + 8 + 9 + 3 = 27 = 9 \times 3$
 Thus, the number 7893 is exactly divisible by 9 without leaving any remainder.....
 So, the amount can be distributed equally among 9 persons.....

Long Answer Questions

19) Keshav has 3125 plants. He planted them in rows, each row with 25 plants. How many rows were there? Also check for the correctness of division.

Solution: Total number of plants Keshav has = 3125.....
 Number of plants in each row = 25.....
 Number of rows = $3125 \div 25$
 Therefore, the number of rows is 125.....
 To check for the correctness of our division, we check if.....
 Dividend = Quotient \times Divisor + Remainder.....
 $3125 = 125 \times 25 + 0$
 $3125 = 3125$

$$\begin{array}{r} 125 \\ 25 \overline{) 3125} \\ \underline{-25} \\ 62 \\ \underline{-50} \\ 125 \\ \underline{-125} \\ 0 \end{array}$$

20) Bala shares 522 chocolates with his friends. If he gives 2, 3, 4, 5 or 10 chocolates to each friend. In how many different ways can he distribute chocolates equally among his friends so that no chocolates remain?

Solution: Number of chocolates that Bala has = 522
 To find if all the chocolates are shared or not, we must find if 522 is exactly divisible
 by 2, 3, 4, 5 or 10.
 522 is exactly divisible by 2 and 3 only. The number is not divisible by 4, 5 and 10.
 So, all the chocolates will be shared only if Bala gives 2 or 3 chocolates to each
 of his friends.



Higher Order Thinking Skills (H.O.T.S.)

Short Answer Question

21) 3826 chocolates are distributed equally among 4 friends. Will there be any chocolates left undistributed? Find out without actual division.

Solution: In 3826, the number formed by the last two digits is 26. 26 is not divisible by 4.
 So, 3826 is not divisible by 4. Hence, some chocolates will be left undistributed.

Long Answer Question

22) In a library, there are 52623 books. How many books are there in each row if they are arranged in 2, 5, 6, 9 and 10 rows? Will some books be left over in each arrangements?

Solution: Number of books in the library = 52623

Number of rows	Number of books in each row (quotient)	Number of books that remain (remainder obtained)
2	$52623 \div 2 = 26311$	1
5	$52623 \div 5 = 10524$	3
6	$52623 \div 6 = 8770$	3
9	$52623 \div 9 = 5847$	0
10	$52623 \div 10 = 5262$	3



Recall

Multiple Choice Questions

- 1) The numbers that divide a given number exactly without leaving a remainder are called the ____ of that number. [A]
 (A) factors (B) multiples (C) divisor (D) dividend
- 2) Two of the factors of 24 are _____. [D]
 (A) 3, 8 (B) 6, 4 (C) 2, 12 (D) all of these
- 3) Two of the factors of 16 are _____. [B]
 (A) 8, 3 (B) 8, 2 (C) 2, 5 (D) 8, 5



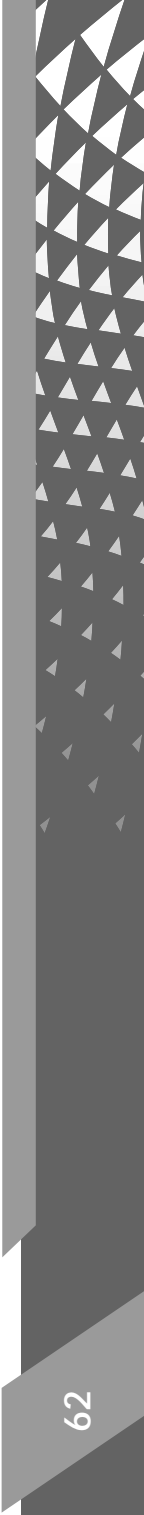
Remembering and Understanding

Multiple Choice Questions

- 4) The list of all the factors of 36 is _____. [B]
 (A) 1, 2, 3, 4, 12, 18, 36 (B) 1, 2, 3, 4, 6, 9, 12, 18, 36
 (C) 1, 2, 3, 4, 5, 6, 36 (D) 1, 2, 3, 4, 5, 9, 12, 18, 36
- 5) The first five multiples of 12 are _____. [D]
 (A) 12, 24, 32, 40, 48 (B) 12, 24, 36, 48, 50
 (C) 5, 10, 15, 20, 25 (D) 12, 24, 36, 48, 60
- 6) _____ is not a factor of 80. [A]
 (A) 14 (B) 2 (C) 10 (D) 16

Fill in the Blanks

- 7) _____ 1 _____ is neither a prime nor a composite number.
- 8) Multiples of even numbers are _____ **even** _____ numbers.
- 9) _____ 2 _____ is the smallest prime number.



Very Short Answer Questions

- 10) Which is the only even prime number?

Solution: 2

- 11) Write the factors of 48.

Solution: 1, 2, 3, 4, 6, 8, 12, 16, 24 and 48

- 12) Write four composite numbers between 1 and 20.

Solution: 4, 6, 8, 9, 10, 12, 14, 15, 16, 18 (any four of these)

Short Answer Questions

- 13) Find the factors of 54 using multiplication.

Solution: $1 \times 54 = 54$

$2 \times 27 = 54$

$3 \times 18 = 54$

$6 \times 9 = 54$

So, the factors of 54 are 1, 2, 3, 6, 9, 18, 27 and 54.

- 14) Find the factors of 36 using division.

Solution: $36 \div 1 = 36$; $36 \div 2 = 18$; $36 \div 3 = 12$

$36 \div 4 = 9$ $36 \div 6 = 6$

So, the factors of 36 are 1, 2, 3, 4, 6, 9, 12, 18 and 36.

Long Answer Questions

- 15) Find the first four common multiples of 6 and 8.

Solution: Multiples of 6: 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72, 78, 84, 90, 96

Multiples of 8: 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96

Four common multiples of 6 and 8: 24, 48, 72, 96

- 16) List out the prime numbers between 51 and 100, using the Sieve of Eratosthenes.

Solution: In the sieve of Eratosthenes the prime numbers are circled while the composite number are crossed out

51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
96	97	98	99	100										

The prime numbers between 51 and 100 are: 53, 59, 61, 67, 71, 73, 79, 83, 89, 97.



Application

Short Answer Questions

17) Find the H.C.F. of 12 and 16.

Solution: The H.C.F. of 12 and 16.

$$12 = 2 \times 2 \times 3$$

$$16 = 2 \times 2 \times 2 \times 2$$

Therefore, H.C.F. of 12 and 16 is $2 \times 2 = 4$.

18) Find the L.C.M. of 15 and 18.

Solution: $15 = 3 \times 5$ $18 = 2 \times 3 \times 3$

Therefore, L.C.M. of 15 and 18 is $2 \times 3 \times 3 \times 5 = 90$.

.....

Long Answer Questions

19) Find the H.C.F. of the following:

- a) 14 and 21 b) 16 and 20

Solution: a) $14 = 2 \times 7$

$$21 = 3 \times 7$$

Therefore, H.C.F. of 14 and 21 is 7.

b) $16 = 2 \times 2 \times 2 \times 2$

$$20 = 2 \times 2 \times 5$$

Therefore, H.C.F. of 16 and 20 is $2 \times 2 = 4$.

20) Find the L.C.M. of the following:

- a) 10 and 15 b) 12 and 20

Solution: a) The multiples of 10 are 10, 20, **30**, 40, 50, ...

The multiples of 15 are 15, **30**, 45, 60, ...

Therefore, L.C.M. of 10 and 15 is 30.

b) The multiples of 12 are 12, 24, 36, 48, **60**, ...

The multiples of 20 are 20, 40, **60**, 80, 100, ...

Therefore, L.C.M. of 12 and 20 is 60.



Higher Order Thinking Skills (H.O.T.S.)

Short Answer Question

21) Write the factor pairs of 64 by multiplication and division facts.

Solution: Multiplication facts: $1 \times 64 = 64$; $2 \times 32 = 64$; $4 \times 16 = 64$; $8 \times 8 = 64$

Division facts: $64 \div 1 = 64$; $64 \div 2 = 32$; $64 \div 4 = 16$; $64 \div 8 = 8$

Therefore, the factor pairs of 64 are (1, 64); (2, 32); (4, 16); (8, 8)

Long Answer Question

22) Write the factors and multiples for the given numbers and find their H.C.F. and L.C.M.

- a) 36, 90 b) 12, 24

Solution: a) Factors of 36: 1, 2, 3, 4, 6, 9, 12, **18**, 36

Factors of 90: 1, 2, 3, 5, 6, 9, 10, 15, **18**, 30, 45, 90

Therefore, H.C.F. of 36 and 90: **18**

Multiples of 36: 36, 72, 108, 144, **180**, ...

Multiples of 90: 90, **180**, 270, 360, ...

Therefore, L.C.M. of 36 and 90 is 180.

b) Factors of 12: 1, 2, 3, 4, 6, **12**

Factors of 24: 1, 2, 3, 4, 6, 8, **12**, 24

Therefore, H.C.F. of 12 and 24: 12

... Multiples of 12: 12, **24**, 36, 48, 60, ...

... Multiples of 24: **24**, 48, 72, 96, 120, ...

... Therefore, L.C.M. of 12 and 24 is 24.

.....

Concept 6.3: H.C.F. and L.C.M.



Recall

Multiple Choice Questions

- 1) Every number is a ____ of itself. [**D**]
 (A) multiple (B) factor (C) divisor (D) all of these
- 2) Every number is a ____ of 1. [**C**]
 (A) divisor (B) factor (C) multiple (D) dividend
- 3) A common multiple of 9 and 18 is _____. [**C**]
 (A) 9 (B) 10 (C) 18 (D) 25



Remembering and Understanding

Multiple Choice Questions

- 4) In which of the following statements is 30 expressed as the sum of two prime numbers? [**B**]
 (A) $12 + 18$ (B) $13 + 17$ (C) $15 + 15$ (D) $10 + 20$
- 5) Which number has only one factor other than itself? [**A**]
 (A) prime number (B) composite number
 (C) odd number (D) even number
- 6) How many multiples can a number have? [**C**]
 (A) as many as the number (B) not more than 100
 (C) infinite (D) only one

Fill in the Blanks

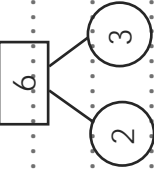
- 7) Composite numbers have more than 2 factors.
8) The largest 2-digit composite number is 99.
9) The smallest 2-digit prime number is 11.

Very Short Answer Questions

- 10) How many prime numbers are there between 20 and 50?

Solution: 7

- 11) Prime factorise 6 using the factor tree method.

Solution: 
 $6 = 2 \times 3$

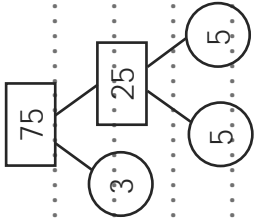
- 12) What are the prime factors of 10?

Solution: 2 and 5

Short Answer Questions

- 13) Prime factorise 75 using the factor tree method.

Solution: Prime factors of 75 using the factor tree are given below.



Therefore, prime factorisation of 75 is $3 \times 5 \times 5$.

- 14) How many prime factors does 78 have?

Solution: $78 = 1 \times 78, 2 \times 39, 3 \times 26, 6 \times 13$

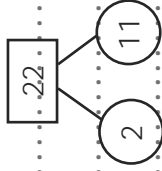
Therefore, the factors of 78 are 1, 2, 3, 6, 13, 26, 39, 78.

There are 3 prime factors 2, 3 and 13.

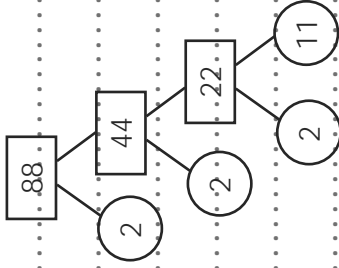
Long Answer Questions

- 15) Prime factorise using the factor tree method: a) 22
b) 88

Solution: a)...



(b)

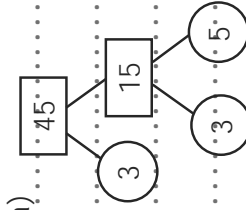
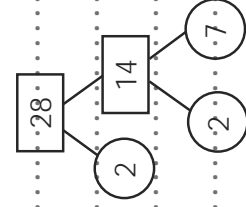


So, prime factorisation of $22 = 2 \times 11$

Prime factorisation of $88 = 2 \times 2 \times 2 \times 11$.

- 16) Prime factorise using the factor tree method: a) 45 b) 28

Solution: ..a)

 $\left(\begin{array}{c} \circ \\ \hline \circ \end{array} \right)$ 

So, prime factorisation of $45 = 3 \times 3 \times 5$,

Prime factorisation of $28 = 2 \times 2 \times 7$



Application

Short Answer Questions

- 17) Find the H.C.F. of 24 and 32 using the prime factorisation method.

Solution:



Prime factors of $32 = 2 \times 2 \times 2 \times 2 \times 2$

Therefore, H.C.F. of 24 and 32 = $2 \times 2 \times 2 = 8$.

- 18) Find the L.C.M. of 24 and 32 using the prime factorisation method.

Solution: Prime factors of 24 = $2 \times 2 \times 2 \times 3$

Prime factors of 32 = $2 \times 2 \times 2 \times 2 \times 2$

Therefore, L.C.M. of 24 and 32 = $2 \times 2 \times 2 \times 2 \times 3 = 96$.

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Long Answer Questions

- 19) Find the H.C.F. and L.C.M. of the following numbers by the prime factorisation method.

a) 36, 42 b) 75, 50

Solution: a) $36 = 2 \times 3 \times 3 \times 2$ b) $75 = 3 \times 5 \times 5$

$42 = 2 \times 3 \times 7$ $50 = 2 \times 5 \times 5$

H.C.F. of 36 and 42 = $2 \times 3 = 6$ H.C.F. of 75 and 50 = $5 \times 5 = 25$

L.C.M. = $2 \times 3 \times 2 \times 3 \times 7 = 252$ L.C.M. = $5 \times 5 \times 3 \times 2 = 150$

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- 20) Find the L.C.M. of the given numbers by the prime factorisation method.

a) 24, 36 b) 40, 50

Solution: a) $24 = 2 \times 2 \times 2 \times 3$

$36 = 2 \times 2 \times 3 \times 3$

Therefore, the L.C.M. of 24 and 36 = $2 \times 2 \times 3 \times 2 \times 3 = 72$

b) $40 = 2 \times 2 \times 2 \times 5$

$50 = 2 \times 5 \times 5$

Therefore, the L.C.M. of 40 and 50 = $2 \times 2 \times 5 \times 2 \times 5 = 200$

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Short Answer Question

21) Find the H.C.F. of 12, 15 and 18.

Solution: The given numbers are 12, 15 and 18.

Prime factorisation of 12 = $2 \times 2 \times 3$

Prime factorisation of 15 = 3×5

Prime factorisation of 18 = $2 \times 3 \times 3$

Therefore, the H.C.F. of 12, 15 and 18 = 3.

Long Answer Question

22) Find the H.C.F. and L.C.M. of 21, 27 and 36.

Solution: The given numbers are 21, 27 and 36.

Prime factorisation of 21 = 3×7

Prime factorisation of 27 = $3 \times 3 \times 3$

Prime factorisation of 36 = $2 \times 2 \times 3 \times 3$

Therefore, the H.C.F. of 21, 27 and 36 = 3

and L.C.M. = $3 \times 7 \times 3 \times 2 \times 2 = 756$.



Practice Questions

1) Using multiplication, find the factors of 32.

2) Prime factorise: a) 76 b) 34 c) 44

3) Check the correctness of division and state whether it is correct or wrong.

Dividend = 64800; Divisor = 18; Quotient = 3600; Remainder = 1

4) Solve: a) $37581 \div 3$ b) $45723 \div 3$ c) $12484 \div 4$

5) Is the number 8573 divisible by 2, 4, 9 and 10?

6) Find the H.C.F. of: a) 24 and 28 b) 42 and 48 c) 7 and 21

- 7) A businessman has 86 trucks. He parks an equal number of trucks near each of his factories. How many factories does he have?
(A) 10 (B) 2 (C) 8 (D) 11
- 8) There are 456 sticks packed in boxes. If each box has an equal number of sticks, how many boxes will be needed? Choose the correct answer from the following options.
(A) 5 (B) 10 (C) 6 (D) 9
- 9) Find the L.C.M. of 13, 26, 39.
- 10) Suren has 38179 paper leaves to stick. How many paper stems will he need so that no leaves are left over? Choose from the given options.
(A) 5 (B) 2 (C) 1 (D) 4
- 11) What are the first five multiples of: a) 9 b) 3 c) 8
- 12) Give the factors of: a) 98 b) 38 c) 24
- 13) Bapu has 43922 rose bushes. He wants to plant an equal number of bushes in each row (with no bushes left over). How many such rows can he make? Choose the correct option.
(A) 1 (B) 4 (C) 9 (D) 10
- 14) Which is the smallest and the largest factor of any number?
- 15) What is the remainder and quotient when 48247 is divided by 7?
- 16) Using division, find the factors of: a) 27 b) 58 c) 36
- 17) Find the highest common factor of 10 and 13.
- 18) Find the least common multiple of 12 and 14.
- 19) How many prime numbers are there from 23 to 44?
- 20) How many composite numbers are there from 34 to 54?
- 21) Divide: a) 89284 by 12 b) 12122 by 10 c) 24684 by 14
- 22) Prime factorise: a) 82 b) 26 c) 66
- 23) Find the prime factorisation of: a) 54 b) 72 c) 33
- 24) Prime factorise: a) 88 b) 22 c) 55
- 25) Find the prime factorisation of 96.
- 26) Divide 76183 by 35.
- 27) Find the L.C.M. of: a) 14 and 18 b) 10 and 12 c) 20 and 30
- 28) Find the H.C.F. of 12, 14, 20.
- 29) What are the common factors of 25 and 30?
- 30) Prime factorise: a) 98 b) 12 c) 91

Teacher Reference: Workbook

Chapter 6: Division



Practice Questions

- 1) 1, 2, 4, 8, 16, 32 2) a) $2 \times 2 \times 19$ b) 2×17 c) $2 \times 2 \times 11$
- 3) Wrong 4) a) 12527 b) 15241 c) 3121
- 5) No 6) a) 4 b) 6 c) 7
- 7) B 8) C
- 9) 78 10) C
- 11) a) 9, 18, 27, 36, 45 b) 3, 6, 9, 12, 15 c) 8, 16, 24, 32, 40
- 12) a) 1, 2, 7, 14, 49, 98 b) 1, 2, 19, 38 c) 1, 2, 3, 4, 6, 8, 12, 24
- 13) A
- 14) smallest = 1; largest = the number itself
- 15) Remainder = 3, Quotient = 6892
- 16) a) 1, 3, 9, 27 b) 1, 2, 29, 58 c) 1, 2, 3, 4, 6, 9, 12, 18, 36
- 17) 1
- 18) 84
- 19) 6 prime numbers: 23, 29, 31, 37, 41, 43
- 20) 16 composite number: 34, 35, 36, 38, 39, 40, 42, 44, 45, 46, 48, 49, 50, 51, 52, 54
- 21) a) Quotient = 7440, Remainder = 4 b) Quotient = 1212, Remainder = 2
- c) Quotient = 1763, Remainder = 2
- 22) a) 2×41 b) 13×2 c) $11 \times 3 \times 2$
- 23) a) $2 \times 3 \times 3 \times 3$ b) $2 \times 2 \times 2 \times 3 \times 3$ c) 11×3
- 24) a) $2 \times 2 \times 2 \times 11$ b) 2×11 c) 5×11
- 25) $2 \times 2 \times 2 \times 2 \times 2 \times 3$
- 26) Quotient = 2176; Remainder = 23
- 27) a) 126 b) 60 c) 60
- 28) 2
- 29) 1, 5
- 30) a) $2 \times 7 \times 7$ b) $3 \times 2 \times 2$ c) 13×7

A – Curriculum to Learning Objectives: Measurement

Prior Knowledge		• Number operation				
Class	Ch. No.	Chapter Name	C. No.	Concept Name	L. Obj. No.	Learning Objectives
1	6	Time	6.1	Earlier and Later	6.1.a	• the terms 'earlier' and 'later', 'shorter'
					6.1.b	• parts of the day
					6.1.c	• sequencing the events happening in a day
			6.2	Long and Short	6.2.a	• identify events with respect to more/less time
2	6	Time	6.1	Days of a Week and Months of a Year	6.1.a	• days of the week and months of the year
					6.1.b	• the terms 'decade' and 'century'
					6.1.c	• features of a calendar
					6.1.d	• seasons in a year
			6.2	Sequence the Events Over Longer Periods	6.2.a	• sequence of events occurring over long periods
					6.2.b	• reading and writing time
3	7	Time	7.1	Read a Calendar	7.1.a	• identifying a day and a date on a calendar
			7.2	Read Time Correct to the Hour	7.2.a	• reading the time correctly to the hour
4	6	Time	6.1	Duration of Events	6.1.a	• reading and writing time
					6.1.b	• the 12-hour and the 24-hour clock formats
					6.1.c	• converting 12-hour clock to 24-hour clock format and vice versa
					6.1.d	• the terms 'duration', 'end time' and 'start time'
			6.2	Estimate Time	6.2.a	• problems involving estimation of time
5	7	Time	7.1	Convert Time	7.1.a	• converting larger units to smaller units of time and vice versa
					7.1.b	• word problems based on time
			7.2	Add and Subtract Time	7.2.a	• adding and subtracting time

B – Vision-to-Action Plan: 7.1 Convert Time

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
1 DD/MM/YYYY	74-76 – THK, RCL, REM/UND	7.1.a	<ul style="list-style-type: none"> Recall reading time from the clock. 	<ul style="list-style-type: none"> Questioning Guided Learning 	–	WB: Pg. 72 (Q. 1-3) TB: Pg. 75 (Example 1)	–	
2 DD/MM/YYYY	76-78 – REM/UND, APP	7.1.a	<ul style="list-style-type: none"> Understand conversion of days to hours, hours to minutes and minutes to seconds, and vice versa. 	<ul style="list-style-type: none"> Peer Learning Interactive Discussion 	–	TB: Pgs. 77, 78 (Examples 5-7) WB: Pg. 72 (Q. 4, 5) WB: Pg. 73 (Q. 8-11, 14) WB: Pgs. 75, 76 (Q. 17, 20)	WB: Pg. 73 (Q. 6, 7, 12, 13, 15, 16) WB: Pg. 75 (Q. 18, 19)	
3 DD/MM/YYYY	78, 79, 83 – HOTS, Drill Time	7.1.b	<ul style="list-style-type: none"> Apply conversion of time in real-life situations. 	<ul style="list-style-type: none"> Practising 	–	TB: Pgs. 78, 79 (Example 8, 9) WB: Pg. 76 (Q. 22) TB: Pg. 83 (Drill Time Q. 1-3)	WB: Pg. 76 (Q. 21)	

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56/61

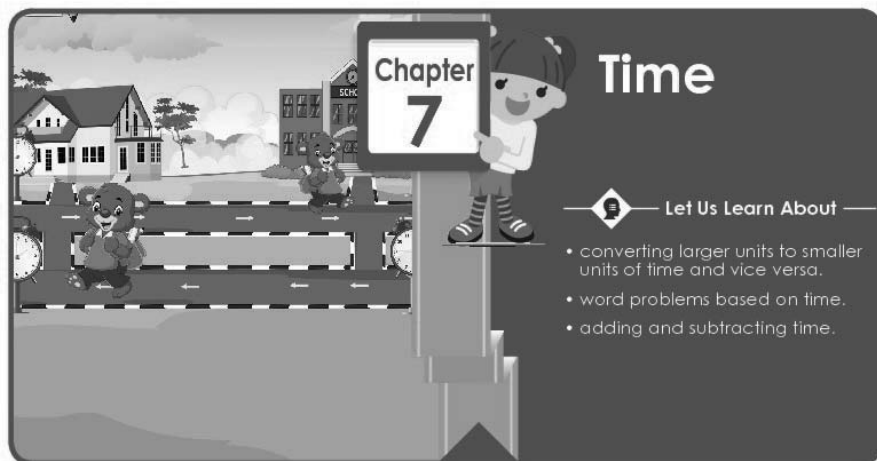
Day:
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Actual Date:

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Important Words

–



Concept 7.1: Convert Time



Think

Pooja's father spends 120 minutes every week reading the newspaper. Pooja wants to know the number of hours he spends reading the newspaper.

Can you find that?



Recall

In Class 4, we have learnt about time and its units such as minutes, hours, days and so on. Let us revise them by solving the following.

1) Draw hands on a clock to show:

- a) 7:33 p.m. b) 4:45 a.m. c) 1:28 p.m. d) 1450 h

Transactional Tip(s)

Duration: 7 min



Questioning:

- Read out the TB: Pg.74, Think section in class. Do not give the correct answer. Observe what approach learners suggest to convert minutes to hours.
- Now, draw a clock on the blackboard and randomly select learners to come and draw the hands of the clock for the given time as mentioned in TB: Pg.74, 'Recall' section.
- Also discuss the time conversion short answer questions as mentioned in TB: Pg.75, 'Recall' section verbally in the class.
- Discuss and solve WB: Pg. 72, Q. 1-3.

Class Pulse Check

Duration: 1 min



- 1) How many weeks are there in a year?

Annual Day:
56/61

Day:
1/3

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2) Answer these questions.

- a) How many hours are there in a day?
- b) How many days are there in a year?
- c) How many days make a week?
- d) How many days are there in a leap year?
- e) How many days does the month of December have?



Remembering and Understanding

We have learnt different units of measuring time such as seconds, minutes, hours, and days. The larger units of measuring time are weeks, months and years.

Let us now learn the conversion of time.

To convert a smaller unit of time to a larger unit, we divide.

To convert a larger unit of time to a smaller unit, we multiply.

Days to hours and hours to days

1 day = 24 hours

1 hour = $\frac{1}{24}$ day

Hours to minutes and minutes to seconds

1 hour = 60 minutes = 60 min

1 minute = 60 seconds

Seconds to minutes and Seconds to hours

1 minute = $\frac{1}{60}$ hour

1 second = $\frac{1}{60}$ minute

1 second = $\frac{1}{60} \times \frac{1}{60}$ hour = $\frac{1}{3600}$ hour

Consider a few examples of conversion of time.

Example 1: Convert the following into hours.

- a) 13 days
- b) 2 days 16 hours

Important Words

Duration: 1 min

- **Today:** hours, days, minutes, seconds

Transactional Tip(s)

Duration: 20 min



Guided Learning:

- Discuss the different units of time - seconds, minutes, hours, days, weeks, months and years.
- Explain how 1 day can be converted to hours and vice-versa. Carry out the calculations on the blackboard for better understanding. Also explain the conversion of hours to minutes and minutes to seconds.
- Ask learners to solve TB: Pgs. 75,76, Example 1 individually, in their notebooks and discuss the solution with learners.

Class Pulse Check

Duration: 1 min



- 1) Convert 2 hours into minutes.

Annual Day:
57/61

Day:
2/3

Actual Date:

Page(s)
76,77

Solution: a) 1 day = 24 h
Therefore, 13 days = $13 \times 24 \text{ h} = 312 \text{ h}$
b) 1 day = 24 h
2 days 16 h = $(2 \times 24 \text{ h}) + 16 \text{ h} = 48 \text{ h} + 16 \text{ h} = 64 \text{ h}$
Therefore, 2 days 16 hours is 64 hours.

Example 2: Convert the following into minutes.

a) 7 hours b) 6 hours 25 minutes

Solution: a) 1 hour = 60 minutes
Therefore, 7 hours = $7 \times 60 \text{ min} = 420 \text{ min}$
b) 1 hour = 60 minutes
6 hours 25 min = $(6 \times 60 \text{ min}) + 25 \text{ min}$
 $= 360 \text{ min} + 25 \text{ min} = 385 \text{ min}$
Therefore, 6 hours 25 minutes = 385 minutes

Example 3: Convert the following into seconds.

a) 5 h b) 28 min c) 3 days d) 6 weeks

Solution: a) 1 hour = $60 \times 60 \text{ s}$
Therefore, 5 h = $5 \times 60 \times 60 \text{ s} = 18000 \text{ s}$
b) 1 min = 60 s
Therefore, 28 min = $28 \times 60 \text{ s} = 1680 \text{ s}$
c) 1 day = 24 h
 $= 24 \times 60 \times 60 \text{ s}$
Therefore, 3 days = $3 \times 24 \times 60 \times 60 \text{ s} = 259200 \text{ s}$
d) 1 week = 7 days
Therefore, 6 weeks = $6 \times 7 \times 24 \times 60 \times 60 \text{ s} = 3628800 \text{ s}$

Example 4: Convert the following:

a) 28 min into hours and days
b) 560 min into hours and min
c) 240 s into min, hours and days

Important Words

Duration: 1 min

- **Last class:** hours, days, minutes, seconds
- **Today:** weeks

Transactional Tip(s)

Duration: 14 min



Peer Learning - Pair/Group:

- Divide the class into groups of four and ask them to solve TB: Pgs. 76,77, Examples 2 - 4.
- They should first discuss the approach with their group members and help the member who is facing difficulty in understanding the approach.
- Discuss the outcome with the class and take their feedback from the learners about the group activity. Did they find it helpful? Did all the members participate? Were their views taken into consideration by other group members?
- Solve and discuss:
 - WB: Pg. 72, Q.4, 5,
 - WB: Pg. 73, Q. 8-11, 14,
 - WB: Pgs. 75, 76, Q. 17, 20.

Class Pulse Check



1) -

Solution: a) $1 \text{ min} = \frac{1}{60} \text{ h}$
 So, $28 \text{ min} = 28 \times \frac{1}{60} \text{ h} = \frac{28}{60} \text{ h} = \frac{7}{15} \text{ h}$
 $1 \text{ min} = \frac{1}{60} \times \frac{1}{24} \text{ days}$
 Therefore, $28 \text{ min} = 28 \times \frac{1}{60} \times \frac{1}{24} \text{ days} = \frac{7}{15} \times \frac{1}{24} \text{ days} = \frac{7}{360} \text{ days}$
 So, $28 \text{ min} = \frac{7}{15} \text{ h} = \frac{7}{360} \text{ days}$.

b) $1 \text{ min} = \frac{1}{60} \text{ h}$
 So, $560 \text{ min} = 560 \times \frac{1}{60} \text{ h} = (540 \times \frac{1}{60} \text{ h} + 20 \text{ min}) = 9 \text{ h } 20 \text{ min}$
 Therefore, $560 \text{ min} = 9 \text{ h } 20 \text{ min}$.

c) $1 \text{ s} = \frac{1}{60} \text{ min} = \frac{1}{60} \times \frac{1}{60} \text{ h} = \frac{1}{60} \times \frac{1}{60} \times \frac{1}{24} \text{ days}$
 So, $240 \text{ s} = 240 \times \frac{1}{60} \text{ min} = 4 \text{ min}$
 $4 \text{ min} = 4 \times \frac{1}{60} \text{ h} = \frac{1}{15} \text{ h}$
 $\frac{1}{15} \text{ h} = \frac{1}{15} \times \frac{1}{24} \text{ days} = \frac{1}{360} \text{ days}$
 Therefore, $240 \text{ s} = 4 \text{ min} = \frac{1}{15} \text{ h} = \frac{1}{360} \text{ days}$.



Application

Let us solve a few real-life examples where conversion of time is used.

Example 5: An aeroplane stops for 600 seconds at Mumbai airport. For how many minutes does it stop?

Solution: We know that 1 minute = 60 seconds. So, 1 second = $\frac{1}{60}$ minutes.
 Therefore, 600 seconds = $\frac{600}{60}$ minutes = 10 minutes.
 Thus, the aeroplane stops for 10 minutes at Mumbai airport.

Example 6: During a television programme, there were 10 breaks of 48 seconds each. For how many minutes did the breaks last?

Solution: There are 10 breaks each of 48 seconds.
 Therefore, total time in seconds = 48 seconds \times 10 = 480 seconds

Important Words

–

Transactional Tip(s)

Duration: 14 min



Interactive Discussion:

- Select three learners and assign them TB: Pgs. 77, 78, Examples 5-7.
- Ask them to go through the solutions and discuss with them as to how they can explain it to the class. See that there are no misconceptions.
- Ask learners to come individually, in front of the class, and solve the examples on the blackboard while explaining each step to the class.

Class Pulse Check

Duration: 1 min



- 1) Convert 6600 minutes to hours.

Annual Day:
58/61

Day:
3/3

Actual Date:

Page(s)
78,79

We know that, 1 minute = 60 seconds.

Thus, 480 seconds = $\frac{480}{60}$ minutes = 8 minutes

So, the breaks lasted for a total of 8 minutes.

Example 7: In January, Seema played for 30 minutes every day. For how much time did she play in that month? Give your answer in seconds.

Solution: In January, Seema played for 30 minutes every day.

Number of days in January = 31

Number of minutes she played in January

= 30 minutes \times 31 days = 930 minutes

1 minute = 60 seconds

So, 930 minutes = 930 \times 60 seconds = 55800 seconds

Therefore, Seema played for 55800 seconds in January.



Higher Order Thinking Skills (H.O.T.S.)

Let us learn the conversion of some more units of time.

Consider the following examples.

Example 8: Roopa travels for $3\frac{1}{2}$ h each day while her sister travels for 3840 seconds. Who travels for a longer duration?

Solution: Time for which Roopa travels = 3 h 30 min

Time for which her sister travels = 3840 sec

= 3600 sec + 240 sec

= 1 h + $(240 \times \frac{1}{60})$ min (Converting seconds to minutes and hours)

= 1 h 4 min

As 3 h 30 min > 1 h 4 min, Roopa travels for a longer duration.

Example 9: Seeta takes 5 days 6 hours and 15 minutes to complete her Science project. How much time in seconds does she take to complete the project?

Important Words

- Last class: weeks
- Today: –

Transactional Tip(s)

Duration: 30 min



Practising:

- Ask learners to solve TB: Pg. 78, Example 8.
- Discuss the approach they used to convert multiple units of time. Guide and correct them if required. Give hints to break the given units into parts, convert them individually and then add the converted time.
- Now, ask them to solve TB: Pgs. 78,79, Example 9. See if everyone is able to solve this with minimal help.
- Solve and discuss:
 - TB: Pg. 83, 'Drill Time', Q.1-3,
 - WB: Pg. 76, Q. 22.

Class Pulse Check



1) -

Annual Day:
58/61

Day:
3/3

Actual Date:

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Solution: Time taken by Seeta to complete the project = 5 days 6 hours and 15 minutes
We know that, 1 day = 24 hours
1 hour = 60 minutes
So, 5 days = 5×24 hours = 120 hours.
 $120 \text{ hours} + 6 \text{ hours} = 126 \times 60 \text{ minutes}$
= 7560 minutes
To find time taken in seconds, we know that 1 minute = 60 seconds
So, $7560 \text{ minutes} + 15 \text{ minutes} = 7575 \times 60 = 454500 \text{ second}$.
Therefore, Seeta took 454500 seconds to complete the project.

Concept 7.2: Add and Subtract Time



Think

Pooja spends 30 minutes playing football and 40 minutes playing basketball. She also spends 1 hour 10 minutes playing tennis every Sunday.

Do you know how much time she spends playing?



Recall

We have learnt the conversion of hours to minutes, minutes to seconds and vice-versa. Let us recall them by completing the given table.

Hours	Minutes	Seconds
2		
	240	
		360
13		
		28800

Important Words

–

Transactional Tip(s)



–

Class Pulse Check



1) –



C – Exit Assessment

	Suggested questions to test the learning objective(s)	Learning objective(s)	Number of learners who answered correctly
1	How many weeks do 336 hours make? (Ans. two weeks)	Period 2 - converting larger units to smaller units of time and vice versa	
2	Express 15840 minutes in days. (Ans. 11 days)	Period 2 - converting larger units of time to smaller units and vice versa	
3	A train stops for 420 seconds at every station. For how many minutes does it stop if there are 11 stops in all? (Ans. 77 minutes)	Period 3 - apply time conversion in real-life situations	
4	Arrange the following in ascending order. 68400 seconds, 1080 minutes, 17 hours, half day. (Ans. Half day, 17 hours, 1080 minutes, 68400 seconds)	Period 3 - converting larger units of time to smaller units and vice versa	

Post-lesson Reflection						
TB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	WB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
<hr/>						
Enthusiastic participation		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Concept clarity in the classroom		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Concept clarity through the workbook		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

	Handhold Learners	Challenge Learners
Names		
Exam Revision Strategy	Reteach <input type="checkbox"/>	Revise <input type="checkbox"/> Practise <input type="checkbox"/>
App Report	Number _____	Signature _____

A – Curriculum to Learning Objectives: Measurement

Prior Knowledge		• Number Operation				
Class	Ch. No.	Chapter Name	C. No.	Concept Name	L. Obj. No.	Learning Objectives
1	6	Time	6.1	Earlier and Later	6.1.a	• the terms 'earlier' and 'later', 'shorter'
					6.1.b	• parts of the day
					6.1.c	• sequencing the events happening in a day
			6.2	Long and Short	6.2.a	• identify events with respect to more/less time
2	6	Time	6.1	Days of a Week and Months of a Year	6.1.a	• days of the week and months of the year
					6.1.b	• the terms 'decade' and 'century'
					6.1.c	• features of a calendar
					6.1.d	• seasons in a year
			6.2	Sequence the Events Over Longer Periods	6.2.a	• sequence of events occurring over long periods
					6.2.b	• reading and writing time
3	7	Time	7.1	Read a Calendar	7.1.a	• identifying a day and a date on a calendar
			7.2	Read Time Correct to the Hour	7.2.a	• reading the time correctly to the hour
4	6	Time	6.1	Duration of Events	6.1.a	• reading and writing time
					6.1.b	• the 12-hour and the 24-hour clock formats
					6.1.c	• converting 12-hour clock to 24-hour clock format and vice versa
					6.1.d	• the terms 'duration', 'end time' and 'start time'
			6.2	Estimate Time	6.2.a	• problems involving estimation of time
5	7	Time	7.1	Convert Time	7.1.a	• converting larger units to smaller units of time and vice versa
					7.1.b	• word problems based on time
			7.2	Add and Subtract Time	7.2.a	• adding and subtracting time

B – Vision-to-Action Plan: 7.2 Add and Subtract Time

Period and Planned Date	TB Page No. and Key Competency	L. Obj. No.	Learning Outcome(s)	Teaching Strategies	Resources	Practice		Areas to Focus
						CW	HW	
1 DD/MM/YYYY	79, 80 – THK, RCL	7.2.a	<ul style="list-style-type: none"> Recall time conversion. Calculate total time by adding and subtracting time. 	<ul style="list-style-type: none"> Interactive Discussion Guided Learning 	–	WB: Pg. 77 (Q. 1-3) TB: Pg. 80 (Example 10)	–	
2 DD/MM/YYYY	81-83 – REM/UND,AP P, HOTS	7.2.a	<ul style="list-style-type: none"> Convert and calculate time with multiple units. Calculate total time in real-life examples. 	<ul style="list-style-type: none"> Peer Learning Interactive Discussion 	–	TB: Pgs. 81, 82, 83 (Examples 12-14) WB: Pg. 77 (Q. 4-6) WB: Pg. 78 (Q. 10) WB: Pgs. 78, 79 (Q. 13, 16) WB: Pgs. 80, 81 (Q. 17, 19)	WB: Pg. 77 (Q. 7-9) WB: Pg. 78 (Q. 11, 12) WB: Pgs. 78, 79 (Q. 14, 15) WB: Pgs. 80, 81 (Q. 18, 20)	
3 DD/MM/YYYY	83, 84 – HOTS, Drill Time	7.2.a	<ul style="list-style-type: none"> Revise time conversion and time calculation. 	<ul style="list-style-type: none"> Direct Instruction 	–	WB: Pg. 82 (Q. 22) TB: Pg. 83 (Drill Time Q.4-6) TB: Pg. 83 (Example 16)	WB: Pg. 82 (Q. 21)	

Annual Day:
59/61

Day:
1/3

Actual Date:

Page(s)
79,80

Solution: Time taken by Seeta to complete the project = 5 days 6 hours and 15 minutes
We know that, 1 day = 24 hours
1 hour = 60 minutes
So, 5 days = 5×24 hours = 120 hours.
 $120 \text{ hours} + 6 \text{ hours} = 126 \times 60 \text{ minutes}$
= 7560 minutes
To find time taken in seconds, we know that 1 minute = 60 seconds
So, $7560 \text{ minutes} + 15 \text{ minutes} = 7575 \times 60 = 454500 \text{ second}$.
Therefore, Seeta took 454500 seconds to complete the project.

Concept 7.2: Add and Subtract Time



Think

Pooja spends 30 minutes playing football and 40 minutes playing basketball. She also spends 1 hour 10 minutes playing tennis every Sunday.

Do you know how much time she spends playing?



Recall

We have learnt the conversion of hours to minutes, minutes to seconds and vice-versa. Let us recall them by completing the given table.

Hours	Minutes	Seconds
2		
	240	
		360
13		
		28800

Important Words

–

Transactional Tip(s)

Duration: 15 min



Interactive Discussion:

- Discuss TB: Pg. 79, 'Think' with the class and ask for their views as to how they can calculate the total time.
- Ask learners to recall the techniques for the conversion of time and complete the table in 'Recall' section.
- Solve and discuss WB: Pg. 77, Q. 1-3.

Class Pulse Check

1) -





Remembering and Understanding

Let us now understand the addition and subtraction of time through some examples.

While adding time, we add the minutes (smaller units) first and then the hours (larger units).

Sometimes, we may have to regroup the sum of the minutes. If the sum of minutes is 60, we convert it to 1 hour and add it to the hours.

Let us see an example.

Example 10: Add: 1 hour 35 minutes and 2 hours 45 minutes

Solution:

Steps	Solved	Solve these																								
Step 1: Write both the numbers one below the other.	<table><thead><tr><th></th><th>Hours</th><th>Minutes</th></tr></thead><tbody><tr><td></td><td>1</td><td>35</td></tr><tr><td>+</td><td>2</td><td>45</td></tr></tbody></table>		Hours	Minutes		1	35	+	2	45																
	Hours	Minutes																								
	1	35																								
+	2	45																								
Step 2: Add hours and minutes separately, regrouping if needed.	<table><thead><tr><th></th><th>Hours</th><th>Minutes</th></tr></thead><tbody><tr><td></td><td>1</td><td>35</td></tr><tr><td>+</td><td>2</td><td>45</td></tr><tr><td></td><td>3</td><td>80</td></tr></tbody></table>		Hours	Minutes		1	35	+	2	45		3	80	<table><thead><tr><th></th><th>Hours</th><th>Minutes</th></tr></thead><tbody><tr><td></td><td>1</td><td>20</td></tr><tr><td>+</td><td>3</td><td>50</td></tr><tr><td></td><td></td><td></td></tr></tbody></table>		Hours	Minutes		1	20	+	3	50			
	Hours	Minutes																								
	1	35																								
+	2	45																								
	3	80																								
	Hours	Minutes																								
	1	20																								
+	3	50																								
Step 3: Check whether the minutes in the sum is greater than or equal to 60. If yes, then convert it into hours.	80 minutes > 60 minutes																									
Step 4: Add the hours obtained in step 3 to the hours obtained in step 2.	<table><tbody><tr><td>3 hours</td><td>80 minutes</td></tr><tr><td></td><td>↓</td></tr><tr><td>1</td><td>← 60 + 20</td></tr><tr><td colspan="2"><hr/></td></tr><tr><td>4 hours</td><td>20 minutes</td></tr></tbody></table> <p>The sum is 4 hours 20 minutes.</p>	3 hours	80 minutes		↓	1	← 60 + 20	<hr/>		4 hours	20 minutes	<table><thead><tr><th></th><th>Hours</th><th>Minutes</th></tr></thead><tbody><tr><td></td><td>2</td><td>30</td></tr><tr><td>+</td><td>2</td><td>20</td></tr><tr><td></td><td></td><td></td></tr></tbody></table>		Hours	Minutes		2	30	+	2	20					
3 hours	80 minutes																									
	↓																									
1	← 60 + 20																									
<hr/>																										
4 hours	20 minutes																									
	Hours	Minutes																								
	2	30																								
+	2	20																								

While subtracting, we subtract the minutes first (smaller units) and then the hours (larger units).

Sometimes, we may have to regroup the hours. Let us see an example.

Transactional Tip(s)

Duration: 14 min



Guided Learning:

- Explain the step-by-step procedure to add time.
- Explain and discuss TB: Pg. 80, Example 10 on the blackboard.

Class Pulse Check

Duration: 1 min



- 1) Add 2 hours 40 minutes and 1 hour 20 minutes.

Annual Day:
60/61

Day:
2/3

Actual Date:

Page(s)
81,82

Important Words

–

Example 11: Subtract: 2 hours 35 minutes from 3 hours 10 minutes

Solution:

Steps	Solved	Solve these														
Step 1: Write both the numbers one below the other, such that the smaller number is subtracted from the larger one.	<table><tr><th>Hours</th><th>Minutes</th></tr><tr><td>3</td><td>10</td></tr><tr><td>- 2</td><td>35</td></tr></table>	Hours	Minutes	3	10	- 2	35	<table><tr><th>Hours</th><th>Minutes</th></tr><tr><td>3</td><td>45</td></tr><tr><td>- 1</td><td>20</td></tr></table>	Hours	Minutes	3	45	- 1	20		
Hours	Minutes															
3	10															
- 2	35															
Hours	Minutes															
3	45															
- 1	20															
Step 2: Subtract hours and minutes separately, regrouping if needed.	10 minutes < 35 minutes. So, borrow 1 hour, that is, 60 minutes and add it to the minutes. (10 + 60 = 70)															
Step 3: Reduce the hours by 1 and subtract the minutes as usual.	<table><tr><th>Hours</th><th>Minutes</th></tr><tr><td>2</td><td>70</td></tr><tr><td>- 2</td><td>35</td></tr><tr><td></td><td>35</td></tr></table>	Hours	Minutes	2	70	- 2	35		35	<table><tr><th>Hours</th><th>Minutes</th></tr><tr><td>4</td><td>20</td></tr><tr><td>- 2</td><td>40</td></tr></table>	Hours	Minutes	4	20	- 2	40
Hours	Minutes															
2	70															
- 2	35															
	35															
Hours	Minutes															
4	20															
- 2	40															
Step 4: Subtract the hours and write the difference.	<table><tr><th>Hours</th><th>Minutes</th></tr><tr><td>2</td><td>70</td></tr><tr><td>- 2</td><td>35</td></tr><tr><td>0</td><td>35</td></tr></table> <p>The difference is 35 min.</p>	Hours	Minutes	2	70	- 2	35	0	35	<table><tr><th>Hours</th><th>Minutes</th></tr><tr><td>5</td><td>30</td></tr><tr><td>- 3</td><td>35</td></tr></table>	Hours	Minutes	5	30	- 3	35
Hours	Minutes															
2	70															
- 2	35															
0	35															
Hours	Minutes															
5	30															
- 3	35															

Example 12: Subtract 4 h 42 min from 380 min.

Solution: We first convert 380 min to hours and minutes.

$$380 \text{ min} = (300 \times \frac{1}{60} \text{ h}) + 80 \text{ min}$$

$$= 5 \text{ h } 80 \text{ min}$$

Therefore, the difference is 1 h 38 min.

Hours	Minutes
5	80
– 4	42
1	38

Transactional Tip(s)

Duration: 15 min



Peer Learning - Pair/Group:

- Ask learners to solve TB: Pg. 81, Example 11 individually, and then discuss the answers. Check if all learners have arrived at the correct answer.
- Divide the class into groups of four and ask them to solve TB: Pg. 81, Examples 11, 12.
- They should first discuss the approach with their group members and then help the member who is facing difficulty in understanding the approach.
- Discuss the outcome and take views from learners about the group activity. Did they find it helpful? Did all the members participate? Were their views taken into consideration by other group members? Resolve conflicts if any. Now, ask them to solve TB: Pg. 82, Examples 13, 14 in groups.
- Solve and discuss:
 - WB: Pg. 77, Q. 4-6,
 - WB: Pg. 78, Q. 10

Class Pulse Check

1) -



Time

81

**Application**

Now let us solve a few examples where the addition and subtraction of time are mostly used.

Example 13: A courier boy delivered letters for 2 hours 35 minutes and parcels for 3 hours 28 minutes in a day. For how long was he on the job?

Solution: Time spent in delivering letters = 2 h 35 min

Time spent in delivering parcels = 3 h 28 min

Total time spent on the job =

Hours	Minutes
2	35
+	3 28
5	63

2 h 35 min + 3 h 28 min = 5 h 63 min

63 > 60

63 min = 1 h 3 min

Therefore, the total time spent on job = (5 h + 1 h) + 3 min = 6 h 3 min.

Example 14: On Saturday, Rima's drawing class lasted for 2 hours 20 minutes, while on Sunday, it lasted for 1 hour 40 minutes. How much longer was the drawing class on Saturday?

Solution: To find how much longer the drawing class on Saturday was, we must subtract 1 hour 40 minutes from 2 hours 20 minutes.

2 h 20 min can be written as 1 h 80 min by regrouping.

So, on Saturday, Rima's drawing class lasted 40 minutes longer.

Hours	Minutes
1	80
-	1 40
0	40

**Higher Order Thinking Skills (H.O.T.S.)**

Now let us solve a few more examples involving addition and subtraction of time.

Example 15: Mr. Roy spends 1 hour 30 minutes in his garden every day. Mr. Pavan does the same for 50 minutes. How much more time does Mr. Roy spend than Mr. Pavan in his garden? Give your answer in seconds.

Solution: Time spent by Mr. Roy in his garden = 1 hour 30 minutes

Time spent by Mr. Pavan in his garden = 50 minutes

To find the required, subtract 50 minutes from 1 hour 30 minutes.

Important Words

–

Transactional Tip(s)

Duration: 14 min

**Interactive Discussion:**

- Divide the class into groups of four and ask them to solve TB: Pg. 82, Example 13.
- They should first discuss the approach with their group members and then help the member who is facing difficulty in understanding the approach.
- Discuss the outcome and take views from learners about the group activity. Did they find it helpful? Did all the members participate? Were their views taken into consideration by other group members? Resolve conflicts if any. Now, ask them to solve TB: Pg. 82, Examples 14, 15 in groups.

Class Pulse Check

Duration: 1 min



1) Calculate:

4 hours + 90 minutes – 1800 seconds

Annual Day:
61/61

Day:
3/3

Actual Date:

Page(s)
83,84

Now, we need to find the answer in seconds.

1 minute = 60 seconds

40 minutes = 40×60 seconds = 2400 seconds

Therefore, Mr. Roy spends 2400 seconds more in his garden.

	Hours	Minutes
	1	30
-	0	50
	0	40

Example 16: Sohan started preparing for his exam from 16th July. The exams were scheduled to begin 25 days later. On which date were the exams scheduled to begin?

Solution: Start date of exam preparation = 16th July

Preparation day for exams includes 16th July.

So, subtract 15 days from 31 days of July.

Number of days of preparation in July = $31 - 15 = 16$

Days of preparation left in the month of August = $25 - 16 = 9$

Therefore, the date when the exam begins is 10th August.



Drill Time

Concept 7.1: Convert Time

1) Convert into days.

- a) 4 years 5 weeks b) 3 years 10 days c) 2 years 15 days
d) 4 years 20 days e) 1 year 3 weeks

2) Convert the given time to hours.

- a) 240 minutes b) 360 minutes and 3600 seconds
c) 180 minutes d) 300 minutes and 3600 seconds

3) Word problems

- a) A bus takes 1 hour and 25 minutes to reach a bus stand. It stops 5 times for 45 seconds at each stop to pick up passengers. For how many minutes did the bus stop?
b) Amit reached his house from school in 110 minutes. Find the time taken by Amit to reach his house in hours and minutes.

Important Words

Duration: 1 min

- **Today:** convert

Transactional Tip(s)

Duration: 28 min



Direct Instruction:

- Instruct learners to solve TB: Pg. 83, Example 16 independently and then discuss the solution with their respective partners.
- Solve and discuss:
 - TB: Pg. 83, Example 16,
 - TB: Pg. 84, 'Drill Time', Q.4-6.

Class Pulse Check

Duration: 1 min



- 1) Convert 6600 minutes to hours.

Annual Day:
61/61

Day:
3/3

Actual Date:

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Important Words

—

Concept 7.2: Add and Subtract Time

4) Add:

- a) 2 hours 40 minutes and 1 hour 33 minutes
- b) 3 hours 26 minutes and 2 hours 22 minutes
- c) 4 hours 31 minutes and 1 hour 28 minutes

5) Subtract:

- a) 1 hour 30 minutes from 3 hours 75 minutes
- b) 2 hours 20 minutes from 5 hours 60 minutes
- c) 1 hour 40 minutes from 6 hours 49 minutes

6) Word problems

- a) Sohail takes 2 hours 30 minutes to complete his homework and Aditya does the same homework in 145 minutes. Who takes less time to complete homework?
- b) Preeti spends 70 minutes on the playground and Andy spends 1 hour 900 seconds on the playground. How much more time Andy does spend than Preeti on the playground?

Transactional Tip(s)

—



Class Pulse Check

1) -





C – Exit Assessment

	Suggested questions to test the learning objective(s)	Learning objective(s)	Number of learners who answered correctly
1	Add 75600 seconds, 1260 minutes and 21 hours and express the sum in hours. (Ans. 63 hours)	Period 1 - adding and subtracting time	
2	Add 3 hours 32 minutes and 150 minutes and 540 seconds. (Ans. 6 hours 11 minutes)	Period 2 - adding and subtracting time	
3	Arun had exams from 10:15 p.m. to 2:45 p.m. Calculate the number of hours he spent in the exam hall. (Ans. 4 hours 30 minutes = 4.5 hours)	Period 3 - adding and subtracting time	
4	Maya spent 5 hours 46 minutes to prepare a science project. She also spent 4 hours 58 minutes on a math project. How much more time did she spend on the science project than the math project? (Ans. 48 minutes)	Period 3 - adding and subtracting time	

Post-lesson Reflection						
TB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	WB completed	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
<hr/>						
Enthusiastic participation		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Concept clarity in the classroom		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Concept clarity through the workbook		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

	Handhold Learners	Challenge Learners
Names		
Exam Revision Strategy	Reteach <input type="checkbox"/> Revise <input type="checkbox"/>	Practise <input type="checkbox"/>
App Report	Number _____	Signature _____

Teacher Reference: Textbook

Chapter 7: Time

Concept 7.1: Convert Time

Drill Time

- 1) Convert into days.
 - a) 4 years 5 weeks = **1495 days**
 - b) 3 years 10 days = **1105 days**
 - c) 2 years 15 days = **745 days**
 - d) 4 years 20 days = **1480 days**
 - e) 1 year 3 weeks = **386 days**
- 2) Convert the given time to hours.
 - a) 240 minutes = **4 hours**
 - b) 360 minutes and 3600 seconds = **7 hours**
 - c) 180 minutes = **3 hours**
 - d) 300 minutes and 3600 seconds = **6 hours**
- 3) Word problems
 - a) A bus takes 1 hour and 25 minutes to reach a bus stand. It stops 5 times for 45 seconds at each stop to pick up passengers. For how many minutes did the bus stop?
 - b) Amit reached his house from school in 110 minutes. Find the time taken by Amit to reach his house in hours and minutes.

Solution: a) 3 min 45 s b) 1 h 50 min

Teacher Reference: Textbook

Chapter 7: Time

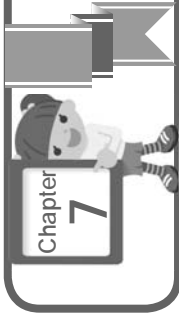
Concept 7.2: Add and Subtract Time

Drill Time

- 4) Add:
- a) 2 hours 40 minutes and 1 hour 33 minutes = **4 hours 13 minutes**
 - b) 3 hours 26 minutes and 2 hours 22 minutes = **5 hours 48 minutes**
 - c) 4 hours 31 minutes and 1 hour 28 minutes = **5 hours 59 minutes**
- 5) Subtract:
- a) 1 hour 30 minutes from 3 hours 75 minutes = **2 hours 45 minutes**
 - b) 2 hours 20 minutes from 5 hours 60 minutes = **3 hours 40 minutes**
 - c) 1 hour 40 minutes from 6 hours 49 minutes = **5 hours 9 minutes**
- 6) Word problems
- a) Sohail takes 2 hours 30 minutes to complete his homework and Aditya does the same homework in 145 minutes. Who takes less time to complete homework?
 - b) Preeti spends 70 minutes on the playground and Andy spends 1 hour 900 seconds on the playground. How much more time Andy does spend than Preeti on the playground?

Solution: a) Aditya

b) 5 minutes



Time

Concept 7.1: Convert Time



Recall

Multiple Choice Questions

- 1) The smallest unit of time is the _____. [A]
(A) second (B) minute (C) hour (D) day
- 2) The number of seconds that make a minute is _____. [B]
(A) 45 (B) 60 (C) 30 (D) 15
- 3) The time shown by the following clock is _____. [D]



- (A) 2:30 (B) 6:08 (C) 6:10 (D) 1:30



Remembering and Understanding

Multiple Choice Questions

- 4) One hour is equal to _____ minutes. [B]
(A) 6 (B) 60 (C) $\frac{1}{6}$ (D) $\frac{1}{60}$
- 5) The number of seconds that make an hour is _____. [C]
(A) 60 (B) $\frac{1}{60}$ (C) 3600 (D) $\frac{1}{3600}$

- 6) One hour is equal to _____ days.

(A) 60 (B) $\frac{1}{60}$ (C) 24 (D) $\frac{1}{24}$

[D]

Fill in the Blanks

- 7) There are 7200 seconds in two hours.

- 8) There are $\frac{1}{60}$ minutes in a second.

- 9) A day has 1440 minutes.

Very Short Answer Questions

- 10) How many hours does a day have?

Solution: 24 hours

- 11) How many hours is 1 minute equal to?

Solution: 1 minute = $\frac{1}{60}$ hour

- 12) How many hours is 1 second equal to?

Solution: 1 second = $\frac{1}{3600}$ hour

Short Answer Questions

- 13) Convert 2 weeks into days.

Solution: 1 week = 7 days
2 weeks = 2×7 days = 14 days

- 14) Convert 4 days into seconds.

Solution: 1 day = 24 hours = $24 \times 60 \times 60$ s
4 days = $4 \times 24 \times 60 \times 60$ s = 345600 s

Long Answer Questions

- 15) Convert the following:

- a) 300 s into min, hours and days

- b) 200 min into hours and min

Solution: a) $1 \text{ s} = \frac{1}{60} \text{ min} = \frac{1}{60} \times \frac{1}{60} \text{ h} = \frac{1}{60} \times \frac{1}{60} \times \frac{1}{24} \text{ days}$

So, $300 \text{ s} = 300 \times \frac{1}{60} \text{ min} = 5 \text{ min}$

$$5 \text{ min} = \frac{1}{12} \text{ h}$$

$$\frac{1}{12} \text{ h} = \frac{1}{12} \times \frac{1}{24} \text{ days} = \frac{1}{288} \text{ days}$$

$$\text{Therefore, } 300 \text{ s} = 5 \text{ min} = \frac{1}{12} \text{ h} = \frac{1}{288} \text{ days}$$

$$\text{b) } 1 \text{ min} = \frac{1}{60} \text{ h}$$

$$\text{So, } 200 \text{ min} = 200 \times \frac{1}{60} \text{ h} = \left(180 \times \frac{1}{60} \text{ h} + 20 \text{ min}\right) = 3 \text{ h } 20 \text{ min}$$

$$\text{Therefore, } 200 \text{ min} = 3 \text{ h } 20 \text{ min}$$

16) Convert the following:

a) 230 s into min, hours and days

b) 27 min into hours and days

$$\text{Solution: a) } 1 \text{ s} = \frac{1}{60} \text{ min} = \frac{1}{60} \times \frac{1}{60} \text{ h} = \frac{1}{60} \times \frac{1}{60} \times \frac{1}{24} \text{ days}$$

$$\text{So, } 230 \text{ s} = 230 \times \frac{1}{60} \text{ min} = \frac{23}{6} \text{ min}$$

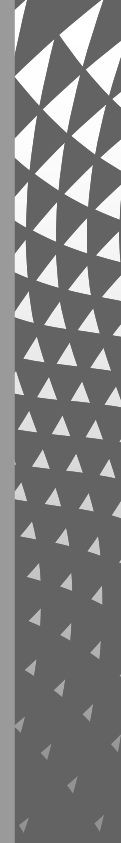
$$\frac{23}{6} \text{ min} = \frac{23}{6} \times \frac{1}{60} \times \frac{1}{24} \text{ days} = \frac{23}{8640} \text{ days}$$

$$\text{b) } 1 \text{ min} = \frac{1}{60} \text{ h}$$

$$\text{So, } 27 \text{ min} = 27 \times \frac{1}{60} \text{ h} = \frac{27}{60} \text{ h} = \frac{9}{20} \text{ h}$$

$$1 \text{ min} = \frac{1}{60} \text{ h} \times \frac{1}{24} \text{ days}$$

$$\text{So, } 27 \text{ min} = 27 \times \frac{1}{60} \times \frac{1}{24} \text{ days} = \frac{9}{20} \times \frac{1}{24} \text{ days} = \frac{9}{480} \text{ days}$$





Short Answer Questions

- 17) Rahul spends 240 minutes every week at his dance class. How many hours does he spend at his dance class?

Solution: 1 hour = 60 minutes. So, 1 minute = $\frac{1}{60}$ hour.
So, 240 minutes = $240 \times \frac{1}{60}$ hour = 4 h
Therefore, Rahul spends 4 hours in a week at his dance class.
.....
.....

- 18) Veena spends 30 minutes every day for exercising. For how much time does she exercise in two weeks?

Solution: Time spent in exercising = 30 minutes
Number of days in two weeks = 14
Total time spent = 30 minutes \times 14 = 420 minutes
Therefore, in two weeks Veena spends 420 minutes for exercising.
.....
.....

Long Answer Questions

- 19) Jai's shop was closed for 180 minutes on Friday. How many hours was the shop closed for? Convert it into seconds.

Solution: Number of minutes for which Jai's shop was closed = 180 minutes
1 minute = $\frac{1}{60}$ hour
Therefore, 180 minutes = $180 \times \frac{1}{60}$ h = 3 hours
Jai's shop was closed for 3 hours.
To convert the time in seconds,
1 minute = 60 seconds
Therefore, 180 minutes = 60×180 seconds = 10800 seconds
.....
.....

- 20) A bus starts from Hyderabad and reaches Bengaluru. However, it halts for 2400 seconds at a food stall. For how many minutes does it stop? Another bus takes the same route. It waits for 240 minutes at the food stall. How many hours did the second bus stop for?

Solution: Time for which the first bus stopped at the food stall = 2400 seconds

To find out how many minutes it stopped,

1 second = $\frac{1}{60}$ minutes

2400 seconds = $2400 \times \frac{1}{60}$ minutes = 40 minutes

Therefore, the first bus stopped for 40 minutes.

Now, the other bus stopped for 240 minutes.

1 minute = $\frac{1}{60}$ hour

240 minutes = $240 \times \frac{1}{60}$ hour = 4 hours

The other bus stopped for 4 hours.

.....



Higher Order Thinking Skills (H.O.T.S.)

Short Answer Question

- 21) Anil travels for $1\frac{1}{2}$ hours on one day and his brother travels for 3780 seconds. Who travels for a longer duration?

Solution: Time for which Anil travels = $1\frac{1}{2}$ h = 1 h 30 min

Time for which his brother travels = 3780 seconds = 3600 s + 180 s = 1 h 3 min

Since 1 h 30 min > 1 h 3 min, Anil travels for a longer duration.

Long Answer Question

- 22) Anita takes 3 days 4 hours and 10 minutes to complete her Maths assignment. How much time in seconds does she take to complete the assignment?

Solution: Time taken by Anita to complete the assignment = 3 days 4 hours and 10 minutes

We know that, 1 day = 24 hours

1 hour = 60 minutes. So, 3 days = 3×24 hours = 72 hours.
 72 hours + 4 hours = 76×60 minutes = 4560 minutes.
 To find the time taken in seconds, we know that 1 minute = 60 seconds.
 So, 4560 minutes + 10 minutes = $4570 \times 60 = 274200$ seconds.
 Therefore, Anita took 274200 seconds to complete the assignment.

Concept 7.2: Add and Subtract Time



Recall

Multiple Choice Questions

- 1) 3 hours is equal to _____. [A]
 (A) 180 minutes (B) 250 minutes (C) 360 minutes (D) 270 minutes
- 2) 2 hours = _____ seconds [D]
 (A) 3600 (B) 360 (C) 720 (D) 7200
- 3) 3600 seconds = _____ hour(s) [A]
 (A) 1 (B) 3 (C) 30 (D) 360



Remembering and Understanding

Multiple Choice Questions

- 4) The sum of 3 hours 20 min and 4 hours 5 min is _____. [A]
 (A) 7 h 25 min (B) 1 h 15 min (C) 7 h 15 min (D) 1 h 25 min
- 5) The sum of 7 hours 25 min and 2 hours 20 min is _____. [C]
 (A) 5 h 25 min (B) 10 h 15 min (C) 9 h 45 min (D) 10 h 5 min
- 6) The difference of 2 hours 5 min and 10 hours 20 min is _____. [C]
 (A) 12 h 25 min (B) 8 h 25 min (C) 8 h 15 min (D) 12 h 15 min

Fill in the Blanks

- 7) 5 hours 20 min + 3 hours 15 min = 8 hours 35 min
- 8) 9 hours 20 min – 3 hours 10 min = 6 hours 10 min
- 9) 4 hours 55 min – 1 hour 25 min = 3 hours 30 min

Very Short Answer Questions

- 10) Subtract 5 hours 10 minutes from 15 hours 15 minutes.

Solution:
.....

- 11) Add: 8 hours 42 minutes and 1 hour 12 minutes

Solution:
.....

- 12) Add: 3 hours 15 minutes and 5 hours 22 minutes

Solution:
.....

Short Answer Questions

- 13) Convert 60 minutes into hours and add it to 1 hour 30 minutes.

Solution: 1 minute = $\frac{1}{60}$ hour
.....

.....
60 minutes = $\frac{60}{60}$ hour = 1 hour
.....

hour	minutes
1	00
1	30
+	
2	30

- 14) Convert 60 seconds into minutes and add it to 3 hours 30 minutes.

Solution: 60 seconds = 1 minute
.....

Adding it to 3 hours 30 minutes, we get

hour	minutes
3	30
0	01
+	
3	31

Long Answer Questions

15) Subtract: a) 14 hours 15 minutes from 25 hours 10 minutes

b) 6 hours 30 minutes from 9 hours 45 minutes

Solution: a) As 10 minutes < 15 minutes, we need to borrow one hour that is 60 minutes and add it to 10 minutes.

Hours	Minutes
24	70
- 14	15
10	55

Hours	Minutes
9	45
- 6	30
3	15

16) Add: a) 2 hours 42 minutes and 3 hours 16 minutes

b) 21 hours 20 minutes and 14 hours 15 minutes

Hours	Minutes
2	42
+ 3	16
5	58

Hours	Minutes
21	20
+ 14	15
35	35



Short Answer Questions

- 17) Raju ran on the race track for 1 hour 15 minutes. Viju ran for 90 minutes. For how much more time did Viju run than Raju?

Solution: Time for which Raju ran on the race track = 1 hour 15 minutes

	Hours	Minutes
Time for which Viju ran = 1 hour 30 minutes	1	30
Time for which Viju ran more than Raju = 1 hour 30 minutes		
1 hour 30 minutes – 1 hour 15 minutes	1	15
	0	15

Therefore, Viju ran 15 minutes more than Raju.

Therefore, Viju ran 15 minutes more than Raju.

- 18) Piyush ate his lunch at 2:00 p.m. He had his dinner after a gap of 6 hours. At what time did Piyush have his dinner?

Solution: The time at which Piyush has his lunch = 2:00 p.m.

Time interval between lunch and dinner = 6 hours

The time at which Piyush has his dinner = 2 p.m. + 6 hours

Therefore, Piyush has his dinner at 8:00 p.m.

.....
.....
.....

Long Answer Questions

- 19) Sonali completed her Maths homework in 1 hour 10 minutes, History homework in 2 hours 20 minutes and Science homework in 1 hour 10 minutes. How long did she take to complete her homework of all the three subjects?

Solution: Time taken by Sonali to complete her Maths homework = 1 hour 10 minutes

Time she takes to complete her History homework = 2 hours 20 minutes

Total time she took to complete Maths and History

homeworks = 1 hour 10 minutes + 2 hours 20 minutes

Hours	Minutes
1	10
2	20
3	30

Time taken to complete her Science homework = 1 hour 10 minutes

The time taken to complete her homework of all the three subjects

$$= 3 \text{ h } 30 \text{ min} + 1 \text{ h } 10 \text{ min}$$

Hours	Minutes
3	30
1	10
4	40

Therefore, the time taken to complete her homework of all the three subjects

is 4 h 40 min.

- 20) Rahul spends 5 hours 45 minutes for a job on Monday, 4 hours and 25 minutes on Tuesday and 4 hours 50 minutes on Wednesday. Find the total time that Rahul spends on his job in those 3 days.

Solution: Time spent by Rahul on Monday = 5 h 45 min

Time spent by him on Tuesday = 4 h 25 min

Total time spent on Monday and Tuesday

$$= 5 \text{ hours } 45 \text{ minutes} + 4 \text{ hours } 25 \text{ minutes}$$

Since, $70 > 60$, $70 \text{ min} = 1 \text{ h } 10 \text{ minutes}$.

So, Rahul spends a total time of 10 hours and 10 minutes on his job on Monday and Tuesday.

Time spent by Rahul on Wednesday = 4 h 50 min

Total time spent on the job on all the three days

$$= 10 \text{ h } 10 \text{ min} + 4 \text{ h } 50 \text{ min}$$

as 60 minutes = 1 hour, add 1 hour to 14 hours which is 15 hours.

Hence, Rahul spends 15 hours on his job.



Short Answer Question

- 21) The scouts of a school began their practice for the Republic day parade 32 days in advance. On which date did they begin?

Solution: Republic day = 26th January
Number of days in advance the scouts began practising = 32
Start date of practice = 26th January – 32 days
So, count backwards from 25th January
Number of days of practice in January = 25 (January 1st to January 25th)
Number of days of practice in December = 32 – 25 = 7
Days of preparation in the month of December = 25th to 31st (7 days)
Therefore, the start date of the practice is 25th December.
.....
.....

Long Answer Question

- 22) Soham started his reading homework at 3:45 p.m. and ended at 4:30 p.m. Then he practised Maths from 4:30 p.m. until 5:00 p.m. Finally, he studied for a Science test from 5:00 p.m. to 5:30 p.m. How much time did Soham spend in all on doing his homework and studying?

Solution: Start time of reading homework = 3:45 p.m.
End time of reading homework = 4:30 p.m.
So, time taken for reading homework = 4:30 p.m. – 3:45 p.m.
= 45 minutes
Time for which Soham does his Maths homework
= 4:30 p.m. to 5:00 p.m.
So, time taken for Maths homework = 5:00 p.m. – 4:30 p.m.
= 30 minutes
.....

Time for which he studies for his Science test
 = 5:00 p.m. to 5:30 p.m.
 So, time taken to study for Science test = 5: 30 p.m. – 5: 00 p.m.
 = 30 minutes
 The total time spent by Soham to do his homework and studying
 = (45 + 30 + 30) minutes
 = 1 hour 45 minutes
 Therefore, Soham spends 1 h 45 min to do his homework and study.



Practice Questions

- 1) If 1 day = 24 hours, how many days are 34 hours?
- 2) Subtract 9 hours 25 minutes from 12 hours 30 minutes.
- 3) Convert to minutes:
 a) 4 hours 46 minutes b) 2 hours 21 minutes c) 6 hours 10 minutes
- 4) Add 7 hours 59 minutes and 1 hour 1 minute.
- 5) Convert 526 minutes into hours and minutes.
- 6) How many seconds are equal to: a) 8 weeks b) 4 weeks c) 3 weeks
- 7) Ujay went on holiday for 7 weeks. For how many minutes did his holiday last?
- 8) A ship took 4 hours 21 minutes to load goods and 3 hours 28 minutes to unload. For how many hours did the ship take to load and unload?
- 9) Varsha completes her EVS assignment in 4 days 3 hours and 10 minutes while Rajiv completes it in 500000 seconds. Who completes it faster?
- 10) Convert into hours. Then convert into days: a) 48 minutes b) 60 minutes c) 24 minutes
- 11) Add 4 hours 25 minutes and 2 hours 15 minutes.

- 12) Add: a) 8 hours 12 minutes and 18 hours 18 minutes
b) 4 hours 10 minutes and 6 hours 23 minutes
c) 6 hours 22 minutes and 3 hours 16 minutes
- 13) Subtract: a) 5 hours 52 minutes from 352 minutes.
b) 4 hours 48 minutes and 6 hours 58 minutes
c) 8 hours 10 minutes and 9 hours 20 minutes
- 14) Sukhman travelled for 13 hours continuously. How many seconds did he travel?
- 15) Convert to hours: a) 4300 seconds b) 2400 seconds c) 1800 seconds
- 16) Subtract 27 hours 12 minutes from 42 hours 10 minutes.
- 17) Karan played for 2 hours 20 minutes and Vishu played for 256 minutes. What is the total time they both played?
- 18) Diana makes bookmarks for 1 hour 26 minutes and packs them as gifts for 2 hours 10 minutes. How much time did she spend on the bookmarks for both the tasks?
- 19) Franky practiced basketball for 84 days before his tournament. For how many weeks did he practise?
- 20) Tom whitewashed the room for 7 hours 21 minutes. He took 6 hours 15 minutes to paint. How much more time did he take to whitewash than to paint?

Teacher Reference: Workbook

Chapter 7: Time



Practice Questions

- 1) $1\frac{5}{12}$ days
- 2) 3 hours 5 minutes
- 3) a) 286 min b) 141 min c) 370 min
- 4) 9 hours 0 minutes
- 5) 8 h 46 min
- 6) a) 4838400 seconds b) 2419200 seconds c) 1814400 seconds
- 7) 70560 minutes
- 8) 7 hours 49 minutes
- 9) Rajiv
- 10) a) $\frac{4}{5}$ hours = $\frac{1}{30}$ days b) 1 hour = $\frac{1}{24}$ day c) $\frac{2}{5}$ hour = $\frac{1}{60}$ day
- 11) 6 hours 40 minutes
- 12) a) 26 hours 30 minutes b) 10 hours 33 minutes c) 9 hours 38 minutes
- 13) a) 0 hour 0 minutes b) 2 hours 10 minutes c) 1 hour 10 minutes
- 14) 46800 seconds
- 15) a) $1\frac{7}{36}$ hours b) $\frac{2}{3}$ hour c) $\frac{1}{2}$ hour
- 16) 14 hours 58 minutes
- 17) 6 hours 36 minutes
- 18) 3 hours 36 minutes
- 19) 12 weeks
- 20) 1 hour 06 minutes

Art Integrated Lesson Plans

Grade: Grade 5, FA 1

Subject: Mathematics

Concept: Identify and Classify Angles

Learning Outcome(s):

- Identifies different angles from the postures of yogasanas
- Classifies angles by making posters

Integrated Art Form(s):

- Roleplay
- Poster making

Materials Required:

Ice-Breaker: NA

Core Activity:

- 1) Chart papers
- 2) Colour pencils
- 3) A pencil
- 4) A ruler

Art Integrated Lesson Plans

Resources (External References):

Ice-Breaker:

- Angles

Core Activity: NA

Time Needed:

Ice-Breaker: 20 min

Core Activity: 60 min

Ice-Breaker:

Summary: Play a video on angles and engage learners in identifying different angles from the postures in yogasanas.

Procedure:

Step 1:

- Inform the learners that they will be shown a video on angles.
- Play the video on angles and urge learners to pay attention to the different kinds of angles shown in the video.
- At the end of the video, ask learners to recall the names of the angles they saw on the video.

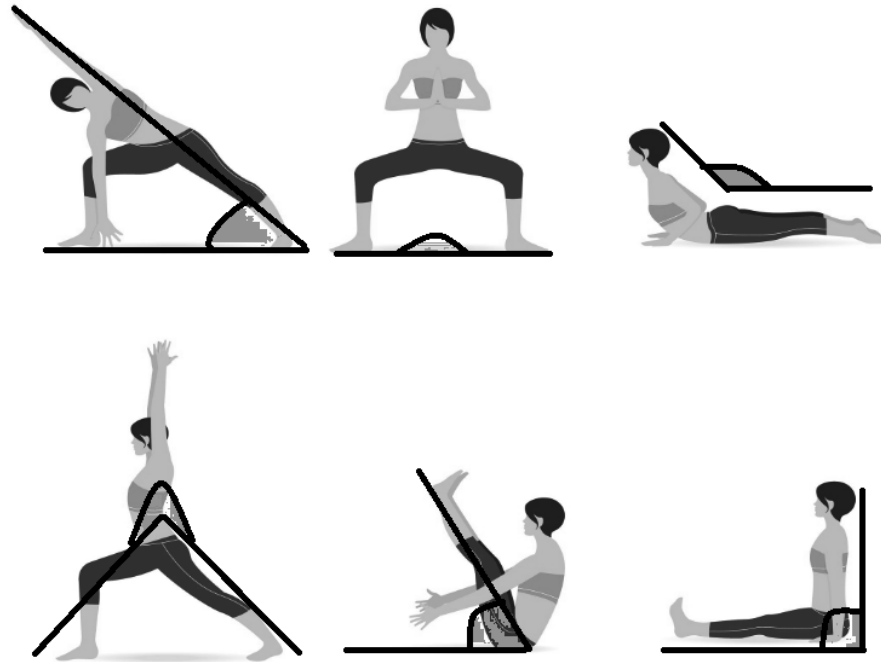
Step 2:

- Explain to the learners that *yogasanas* originated in India around 2nd to 4th century CE. Patanjali describes *asanas* as "a steady and comfortable posture" used for *pranayama* and meditation leading to self-realization. The *asanas* were created at different times, a few being ancient, some medieval, and a growing number in the recent times. Different schools of yoga, agree that *asanas* are best practised with a well-rested body on an empty stomach after taking a bath. To sportspersons, *asanas* function as active stretching exercises, helping to prevent injury to muscles.

Art Integrated Lesson Plans

Ask learners if they know any *yogasanas*, and invite learners who know them to come forward and play the role of a yoga teacher. Instruct the rest of the class to carefully observe the different *asanas* shown by the yoga teacher.

- Ask learners to identify the different angles formed during those *yogasanas*.
- Show learners the following pictures too and encourage them to identify the angles in each posture. Ensure participation of all the



learners in the activity.

Core Activity:

Summary: Facilitate a group activity where learners make a poster on the different types of angles that they have learnt.

Procedure:

- Divide the class into groups of five.

Art Integrated Lesson Plans

- Provide each group with a chart paper, a pencil, a ruler and colour pencils.
- Instruct each group to work together and make a poster demonstrating different types of angles.
- Ask learners to make the posters with bright colours.
- Encourage all the learners to participate in the activity.
- Allow each group 45 minutes to make their posters.
- Guide the groups in their activity, if needed.
- Once the activity is completed, ask each group to present their posters to the class in the remaining 15 minutes.
- Conclude by asking the learners to talk about the types of angles in their posters.

Extension Activity:

Instruct the learners to identify and classify the angles in the letters of their mother tongue or regional language.

Assessment:

Use the Assessment Rubric given to evaluate the learner.

Conclusion:

These activities improve the creativity of the learners and enhance their understanding of the concept of angles and the different types of angles.

Art Integrated Lesson Plans

Suggested Rubric for Assessing Art Integrated Learning

P A R A M E T E R S	LEVELS	Proficient	Evolving	Beginner	Pre-Beginner
	RATING	4	3	2	1
	Knowledge Construction and Expression	Demonstrates excellent use of inquiry and higher order thinking skills, and accurate representation of arts standards.	Demonstrates good use of inquiry and higher order thinking skills and effective representation of arts standards.	Demonstrates moderate use of inquiry and higher order thinking skills and occasional representation of arts standards.	Demonstrates minimal use of inquiry and higher order thinking skills and little representation of arts standards.
	Collaboration	Participates proactively in community building through collaborative work, and always communicates well within team(s) and with the facilitator.	Participates actively in community building through collaborative work, and mostly communicates within team(s) and with the facilitator.	Participates moderately in community building through collaborative work, and occasionally communicates within team(s) and with the facilitator.	Participates rarely in community building through collaborative work, and hardly communicates within team(s) and with the facilitator.
	Envisioning	Engages proactively in rigorous arts integration by embracing change; has multiple perspectives and takes adequate calculated risks .	Engages actively in arts integration by accepting change; has some perspectives and takes some calculated risks .	Engages moderately in arts integration by accepting few changes; has few perspectives and takes few calculated risks .	Engages rarely in arts integration; has minimal perspectives and hardly takes risks .
	Art and Content Integration	Displays a clear connect between the arts and learning outcomes.	Displays an acceptable connect between the arts and learning outcomes.	Displays a moderate connect between the arts and learning outcomes.	Displays a rare connect between the arts and learning outcomes.
	Self-Assessment	Demonstrates significantly increased awareness of relevance and purpose of the arts integration process.	Demonstrates increased awareness of relevance and purpose of the arts integration process.	Demonstrates occasional awareness of relevance and purpose of the arts integration process.	Demonstrates rare awareness of relevance of the arts integration process.

Art Integrated Lesson Plans

Grade: 5, FA 2

Subject: Mathematics

Concept: Add and Subtract Large Numbers

Learning Outcome(s):

- Adds and subtracts large numbers using flash cards and roleplay

Integrated Art Form(s):

- Roleplay

Materials Required:

Ice-Breaker:

- 1) Flash cards with large numbers (up to 8 digits)

Core Activity: NA

Resources (External References):

Ice-Breaker:

- Adding 8-digit numbers

Core Activity: NA

Art Integrated Lesson Plans

Time Needed:

Ice-breaker: 20 min

Core Activity: 60 min

Ice-Breaker:

Summary: Show learners a video on adding large numbers to set the context for the activity.

Procedure:

Step 1:

- Inform learners that they are going to watch a video on adding large numbers.
- Instruct them to carefully observe the steps shown in the video.
- Play the video on adding 8-digit numbers to make the learners understand the method.
- Ask learners to remember the method.

Step 2:

- Provide each learner with a flash card of a large number.
- Instruct learners to pair up with their friends, and add and subtract the numbers on their cards.
- Ask learners to write the sum and the difference of their numbers in their notebooks.

Core Activity:

Summary: Facilitate a roleplay activity where learners apply their understanding of addition and subtraction of large numbers.

Procedure:

- Divide the class into two groups.
- Instruct a learner from each group to play the role of the sarpanch of a village.
- Ask the sarpanch in group 1 to write the number of children in their village on the blackboard.

Art Integrated Lesson Plans

- Inform the learner that they should write a number of 7 to 8 digits.
- Instruct them to write the number of adults in their village on the blackboard as well.
- Inform the learner that this number should not be more than 8 digits.
- Ask all the learners in group 2 to find the total population of Group 1's village.
- Next, ask the sarpanch in group 2 to write the total population of their village on the blackboard.
- Inform the learner that they should write a number with not more than 8 digits.
- Instruct them to also write the number of children in their village on the blackboard.
- Inform the learner that they should write a number with less than 8 digits.
- Ask all the learners in group 1 to find the number of adults in Group 2's village.
- Encourage all the learners to participate in the activity.

Extension Activity:

Ask learners to find the population of their region in terms of number of males, females, children and then compute the total population. They can take help of the internet.

Assessment:

Use the Assessment Rubric given to evaluate the learner.

Conclusion:

These activities help the learners to improve their skill of addition and subtraction of large numbers. They also induce an idea in the learners about the demographics of their region.

Art Integrated Lesson Plans

Suggested Rubric for Assessing Art Integrated Learning

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	Envisioning	Engages proactively in rigorous arts integration by embracing change; has multiple perspectives and takes adequate calculated risks .	Engages actively in arts integration by accepting change; has some perspectives and takes some calculated risks .	Engages moderately in arts integration by accepting few changes; has few perspectives and takes few calculated risks .	Engages rarely in arts integration; has minimal perspectives and hardly takes risks .
	Art and Content Integration	Displays a clear connect between the arts and learning outcomes.	Displays an acceptable connect between the arts and learning outcomes.	Displays a moderate connect between the arts and learning outcomes.	Displays a rare connect between the arts and learning outcomes.
	Self-Assessment	Demonstrates significantly increased awareness of relevance and purpose of the arts integration process.	Demonstrates increased awareness of relevance and purpose of the arts integration process.	Demonstrates occasional awareness of relevance and purpose of the arts integration process.	Demonstrates rare awareness of relevance of the arts integration process.

Art Integrated Lesson Plans

Grade: 5, SA 1

Subject: Mathematics

Concept: Factors and Multiples

Learning Outcome(s):

- Explores the factors and multiples of 2-digit numbers through bead work

Integrated Art Form(s):

- Bead work

Materials Required:

Ice-Breaker:

- 1) Multiplication charts of numbers 1 to 12 as shown below.

×	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

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Core Activity:

- 1) Beads of different colours
- 2) Paper cups

Resources (External References):

Ice-Breaker: NA

Core Activity:

- Factors and Multiples

Time Needed:

Ice-Breaker: 15 min

Core Activity: 70 min

Ice-Breaker:

Summary: Inform the learners that they will be finding the multiples of numbers using charts of multiplication.

Procedure:

- Divide the class into groups of 5.
- Distribute a multiplication chart to each group.
- Write 5 different numbers for each group on the blackboard.
- Inform the groups that they have to find any 5 multiples of each number assigned to them.
- Ask learners in each group to copy the set of numbers given to their group in their notebooks.

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- Instruct them to take turns to write the multiples of the numbers using the multiplication chart, in their notebooks.
- Invite learners from each group to read out the multiples that they have written for the numbers given to them.
- Ensure that all learners participate in the activity.
- If time permits, the groups can take up other sets of numbers and repeat the process.

Core Activity:

Summary: Facilitate a group activity in which learners find out the factors of given numbers using beads.

Procedure:

- Inform learners that they will be watching a video on factors and multiples.
- Play the video on factors and multiples.
- Ask learners to observe the methods of finding factors and multiples.
- Divide the class into groups of four or five.
- Divide the beads into different quantities for the groups. For example, group 1 may be given 48 beads, group 2 may be given 35 beads and so on.
- Also, distribute some paper cups among the groups.
- Ask learners to divide the beads in equal numbers and put in the cups to see if the beads could be divided in equal parts or if any bead would be remaining. For example, a group that got 12 beads, can put 1 bead each in 12 cups in the first round.
- Ask them to note the number of beads in each cup and the number of cups used. In this case, they have to note the numbers, 1 and 12.
- Instruct learners to try putting the beads in 2s, 3s, 4s and so on.
- Inform learners that they should make a note as many times as they can equally distribute all the beads without any bead being left over. In the example given previously, they would write 1, 12; 2, 6; 3, 4; 4, 3; 6, 2 and 12,1.
- Instruct them to write down the first number in each pair of beads and the number of cups used in each case, in their notebooks.
- Tell them that these numbers give us all the factors of a given number. In this example, factors of 12 are 1, 2, 3, 4, 6 and 12.

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- Instruct learners to repeat the activity with the other numbers for more practice.
- Encourage all learners to participate in the activity.

Extension Activity:

Ask learners to pick some random dates from the calendar of a month, and mark the factors and multiples of those numbers within the same month. Ask them to identify which number in the calendar of that month has the maximum number of multiples and which has the maximum number of factors.

Assessment:

Use the Assessment Rubric given to evaluate the learner.

Conclusion:

These activities help learners gather experiential learning of finding factors and multiples of numbers.

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Suggested Rubric for Assessing Art Integrated Learning

P A R A M E T E R S	LEVELS	Proficient	Evolving	Beginner	Pre-Beginner
	RATING	4	3	2	1
	Knowledge Construction and Expression	Demonstrates excellent use of inquiry and higher order thinking skills, and accurate representation of arts standards.	Demonstrates good use of inquiry and higher order thinking skills and effective representation of arts standards.	Demonstrates moderate use of inquiry and higher order thinking skills and occasional representation of arts standards.	Demonstrates minimal use of inquiry and higher order thinking skills and little representation of arts standards.
	Collaboration	Participates proactively in community building through collaborative work, and always communicates well within team(s) and with the facilitator.	Participates actively in community building through collaborative work, and mostly communicates within team(s) and with the facilitator.	Participates moderately in community building through collaborative work, and occasionally communicates within team(s) and with the facilitator.	Participates rarely in community building through collaborative work, and hardly communicates within team(s) and with the facilitator.
	Envisioning	Engages proactively in rigorous arts integration by embracing change; has multiple perspectives and takes adequate calculated risks .	Engages actively in arts integration by accepting change; has some perspectives and takes some calculated risks .	Engages moderately in arts integration by accepting few changes; has few perspectives and takes few calculated risks .	Engages rarely in arts integration; has minimal perspectives and hardly takes risks .
	Art and Content Integration	Displays a clear connect between the arts and learning outcomes.	Displays an acceptable connect between the arts and learning outcomes.	Displays a moderate connect between the arts and learning outcomes.	Displays a rare connect between the arts and learning outcomes.
	Self-Assessment	Demonstrates significantly increased awareness of relevance and purpose of the arts integration process.	Demonstrates increased awareness of relevance and purpose of the arts integration process.	Demonstrates occasional awareness of relevance and purpose of the arts integration process.	Demonstrates rare awareness of relevance of the arts integration process.

How to Create an Effective Learning Environment?

NCF 2022 aims at achieving a holistic overall transformation of the teaching-learning process that will ensure an enjoyable, inclusive and positive overall learning experience. NCF 2022 asserts that the teacher is at the heart of the practice of education and is the torchbearer of the transformation it envisions for the Indian education system. It also re-emphasises the overall guiding principles of the NEP 2020, some of which include:

- a) achieving Foundational Literacy and Numeracy by all students by Grade 3,
- b) emphasis on conceptual understanding rather than rote learning and learning for examinations,
- c) development of 21st-century skills such as problem-solving, creativity, and critical thinking to encourage logical decision-making and innovation
- d) respect for diversity and respect for the local context in curriculum and pedagogy

Here we have outlined some additional pointers that are in alignment with NCF 2022 that we feel will support teachers of mathematics.

What would you choose as your goal for maths teaching?

- (A) *to complete the syllabus as per the book by the end of the year*
- (B) *to ensure that learners perform to the best of their abilities in tests*
- (C) *to ensure that learners are able to add, subtract, multiply and divide one-digit, two-digit, three-digit, four-digit and five-digit numbers*



Which option did you choose? Did you choose all of them? All of these options are parts of the larger goals of maths teaching. The National Curriculum Framework states that maths teaching should not focus on *mathematical content* but on *mathematical learning environments*, where learners are exposed to processes such as:

- ☆ Visualisation
- ☆ Representation
- ☆ Use of patterns
- ☆ Mathematical communication
- ☆ Estimation and approximation
- ☆ Formal problem solving

- ☆ Making connections
- ☆ Optimisation
- ☆ Reasoning and proof




These are some keywords related to the larger goals of teaching mathematics. The ClassKlap Teacher Companion Books have been developed keeping in mind these larger goals. However, there are some broad principles of mathematics teaching as well, which will help you create an effective learning environment. Below are some of these principles:

- 1) Have learners repeat maths problems in their own words:** This is an important exercise for Indian classrooms since English is not the mother tongue for most learners. Being able to rephrase word problems in their own words in English or their mother tongue is a great way to ensure that learners are engaging with the content. It also provides you, the teacher, insight into the comprehension level of your learners.
- 2) Error analysis:** Correcting learners' homework or classwork is actually an exciting opportunity for you to see trends in errors. Use that input for your next lesson to ensure that misconceptions keep getting clarified as you teach.
- 3) Summarise key points:** Use the blackboard to put up the key points/facts/steps/formulas related to the concept you are teaching. Ideally, every lesson or concept should begin with a clearly defined objective and should end with you summarising the key points you want learners to remember. Guiding learners to repeat the key points in verbal or written form is an effective principle.
- 4) Make maths teaching concrete:** Maths is all around us! It is the building block for nearly everything we do in our everyday lives. Art, architecture, finance, engineering and even sports and music have maths as their basis. The more we are able to relate maths to life around us and make this otherwise abstract subject concrete, the more beneficial it is for learners. Do not leave any opportunity to provide concrete examples using objects (manipulatives) or to share concrete examples before proceeding to abstract concepts. NCF 2022 lays special emphasis on developing mathematical abstract ideas (concepts) through concrete experience [ELPS].
- 6) Focus on fact fluency:** Maths is all about remembering the rules and practising. Research proves that learners who are provided with the opportunity to practise maths, develop the skills necessary to solve complex maths problems. Helping learners develop pace in processing basic fundamental skills such as addition, subtraction, multiplication and division is extremely important. This can be easily achieved through games, quizzes, timed group competitions and activity-oriented teaching.



7) Show concern for the performance of individual learners: Each learner is unique and may have different kinds of difficulties in learning. It is important to remember and have faith that *all learners can learn*. Showing faith in the learning abilities of all your learners, paying attention to their thought processes, making your classes interactive and taking everyone along through your teaching will certainly ensure success.

End-of-Term Reflection




Q 1) Which were the four best performing areas/concepts for Term 1 as per your Teacher Companion Book?

- 1) _____
- 2) _____
- 3) _____
- 4) _____

Q 2) Which four areas/concepts were highlighted for improvement as per your Teacher Companion Book?


- 1) _____
- 2) _____
- 3) _____
- 4) _____



Q 3) Which transactional tips do you find most useful to remediate the areas/concepts highlighted for improvement?

Q 6) List at least five learners who you would like to particularly support based on inputs from the Teacher Companion Book.

- 1) _____
- 2) _____
- 3) _____
- 4) _____
- 5) _____



Q 4) How many periods have you used to remediate areas/concepts highlighted in the Teacher Companion Book?

Q 5) What other transactional tips do you plan on using in Term 2?

