



PROFESSIONAL DEVELOPMENT
FOR QUALITY EDUCATION

GRADE

4

LESSON PLANS FOR TEACHERS MATHEMATICS

Based on Curriculum 2020



Directorate of Curriculum and Teacher Education (DCTE)
Khyber Pakhtunkhwa, Abbottabad

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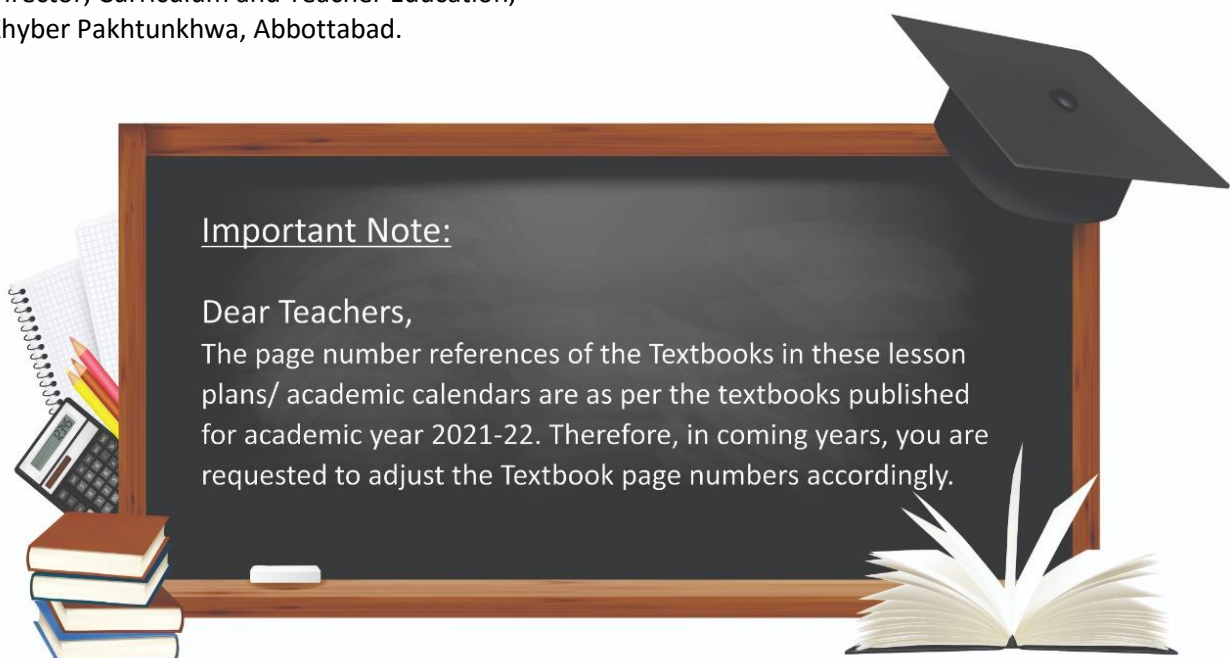
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NOTIFICATION:

No.5236-5399/F.24/Vol-II/SLP/G-IV/SS-M&E, dated: 30-08-2021 : Consequent upon its development and review by the respective development and review committees notified for the purpose, the Directorate of Curriculum and Teacher Education (DCTE), Khyber Pakhtunkhwa, Abbottabad, being the competent authority under the Khyber Pakhtunkhwa Supervision of Curricula, Textbooks and Maintenance of Standards of Education Act 2011, is pleased to notify the scripted lessons for Grade-IV in the subjects of English, Urdu, Mathematics and Social Studies based on Curriculum 2020 and the textbooks aligned on it for all educational institutions in Khyber Pakhtunkhwa for the Academic Year 2021-22 and onwards.

DIRECTOR

Copy forwarded for information and necessary action to the:

1. Secretary, Elementary & Secondary Education Department Govt. of Khyber Pakhtunkhwa, Peshawar.
2. Director, Elementary & Secondary Education Khyber Pakhtunkhwa.
3. Director, Professional Development, Khyber Pakhtunkhwa Landey Sarak Charsadda Road Larama, Peshawar.
4. All District Education Officers (M/F) in Khyber Pakhtunkhwa and Newly Merged Districts (NMDs).
5. All Sub Divisional Education Officers (M/F) in Khyber Pakhtunkhwa and Newly Merged Districts (NMDs).
6. Team Leader ASI-KESP, at Peshawar.
7. PS to Minister Elementary & Secondary Education, Khyber Pakhtunkhwa, Peshawar.
8. PS to the Director Local Office.

ADDITIONAL DIRECTOR (SS)

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INTRODUCTION

Teaching and learning process in the classroom can vary concerning the ability, experience, and training of the teacher, which is why to standardize instruction, every good and effective teacher requires a lesson plan. The preparation of a lesson plan is important for clarity and comprehension regarding how the entire learning process will be handled as well as how students can understand and store the knowledge that is being passed onto them.

Lesson plans are vital for helping students accomplish their goals within a learning environment on a short-term and long-term basis. Lesson plans based on clearly defined Student Learning Outcomes (SLOs) concerning the textbooks ensure students are taught the required curriculum most efficiently. These ensure the teacher is adequately prepared and has a clear sense of direction for their lessons. In the context of Khyber Pakhtunkhwa, Lesson Plans are designed to support teachers to implement new pedagogical methods and help provide direction to instruction in the classrooms.

Traditional teaching Style:

Many teachers in Pakistan have come to rely on the textbook for teaching. They come into the classroom, ask students to open the textbook on a certain page, have students read a portion of the text, paraphrase the same and then ask students to answer questions that require them to reproduce material from the text. They teach every subject (the exception being mathematics) and every lesson in the same way. In some cases, the teacher is unable to complete the curriculum or impart the SLOs for a particular grade to the students effectively. Using lesson plans ensure standardization in teaching quality and provides a clear goal with relevant activities that can help students learn more effectively and achieve curriculum milestones.

What is a lesson Plan?

A lesson plan is a description of the instructions for the purpose of teaching the contents of the textbook of a particular subject and achieving Student Learning Outcomes (SLOs).

A lesson plan is the road map for teachers for the achievement of SLOs effectively during class time. The teachers design appropriate learning activities and develop strategies to obtain feedback on students' learning. A carefully constructed lesson plan allows the teacher to enter the classroom with more confidence and maximizes the chance of having a meaningful learning experience with the students.

A successful lesson plan addresses and integrates three key components:

- ✧ Student Learning Outcomes (SLOs).
- ✧ Learning activities.
- ✧ Assessment to check for students' understanding.

Benefits of Lesson Planning

Most important benefits of lesson planning are to:

- Improve the quality of teaching and learning.
- Establish clarity of purpose.
- Facilitate achievement of student learning outcomes.
- Use available time effectively.
- Develop appropriate materials and ensure their effective use.
- Develop the confidence of teachers.

Development Process of a Lesson Plan

Lesson plan usually starts with a thinking process. This thinking process is basically completed in four parts.

- **First**, determine the SLO; that is, what the children will learn, what they will be able to do upon completing the activities or work of the lesson.
- **Second**, determine what the students already know, before beginning of the lesson that can lead into a new curriculum of the day.
- **Third**, determine at least one way to assist the students in learning the new curriculum.
- **Fourth**, determine a way to evaluate the learning outcomes of the students.

Components of a Lesson Plan

Common elements of lesson plans are; unit of study, a title/topic/problem, identification of student learning outcomes (SLOs), a sequence of learning activities including introductory, developmental and concluding activities, list of materials to be used and assessment strategies.

- ✧ **Choosing the Topic.** You can choose any topic from the textbook of the designated grade, a skill such as information gathering, a value such as peace, a current affair topic or an area of special concern such as the environmental pollution etc.
- ✧ **Identifying Student Learning Outcomes (SLOs) from the Curriculum.** The Curriculum has identified the student learning outcomes to be achieved for each topic. Identifying the student learning outcomes will help you to clarify the knowledge, skills, attitudes and values to be developed. Choose only one to three SLOs to develop your lesson (many more for a unit plan).
- ✧ **Material Resources.** A key part of planning is to ensure the identification, adaptation and development of resources required for the lesson for both teachers and students.
- **Development:**
 - ✧ **Introductory Activities:** Introductory activities are designed to introduce the topic, a subtopic or establish connection with the previous lesson. They are designed to build readiness, create interest, raise questions and explore what children already know about the topic, recall relevant information, motivate students and focus their attention on the topic/ theme/problem to be studied. Introductory activities can

include an arrangement of pictures and other times that stimulate interest and questions. Others may be based on the teacher posing questions, reading a poem or story etc. A test, an inventory, or a quiz may be used to find out what students know in order to build on their existing knowledge.

- ✧ **Developmental Activities:** Developmental activities should emerge out of the introductory activities. There should be smooth transitions between the activities to provide a smooth learning sequence. These activities are designed to actualize the student learning outcomes. They introduce new concepts, skills and values or build on past learning and should be linked with each other. Applicative or demonstrative activities extend learning and develop the ability to use concepts and skills. Creative and expressive activities enrich learning and develop the ability to improvise and apply learning in original ways.
- ✧ **Concluding the lesson:** Conclusion includes activities that serve to consolidate, summarize, or facilitate application of knowledge and skills of students to a new situation. They are generally related to the main idea of the lesson. The concluding activities could bring together the different main ideas of the unit. In this case, the emphasis should be on the educational outcomes and not on “putting on a show”.
- ✧ **Assessment of Learning.** Assessment strategies can tell us how well or to what extent the student learning outcomes have been met. Assessment of learning is important in all phases of the lesson/unit from introduction to conclusion. A variety of tools can be used to assess the realization of the chosen learning out-comes. Some of these will be prepared as part of the learning activities. For example, the drawing and labelling of a map, the checklist for evaluating a discussion or simply asking questions relevant to the day’s topic. Other tools such as tests can be prepared ahead of time as well.
- ✧ **Follow up/homework task.** This component includes follow up activities or home assignments to be under-taken by students at home.

PREFACE

The Government of Khyber Pakhtunkhwa, Elementary and Secondary Education Department, is committed to improve the quality of teaching and learning by taking a number of reforms and initiatives for the improvement of quality education in line with the national and international emerging trends. Providing quality education at primary level is the first imperative step towards achieving this goal.

For this purpose, the Directorate of Curriculum and Teacher Education Khyber Pakhtunkhwa, at Abbottabad, has been entrusted the responsibility of developing and reviewing teachers' in-service and pre-service training materials for the improvement of pedagogical skills of teachers.

These quality improving initiatives also include development of teacher's guides of scripted lesson plans at primary level that support teachers to implement new pedagogical methods. These teacher guides are intended to assist teachers with the provision of content, effective teaching methods and tools for measuring what learners have gained. These guides will ensure an effective and participative engagement of teachers with students as activities included in these lesson plans are student-centered.

These teachers' guides of Lesson Plans based on Student Learning Outcomes (SLOs) of Curriculum 2006 were developed for the first time in 2013. In 2018-2019, the Directorate of Curriculum & Teachers' Education Khyber Pakhtunkhwa undertook the task to revise and develop the Scripted Lesson Plans for Grade I-III according to the Academic Calendar on missing Students Learning Outcomes (SLOs).

As the Curriculum has been revised and new textbook are developed in 2020 for Grades Pre-I to V, hence the need has been felt that these Lesson Plans for Grades I to V are to be revised, developed and aligned with the updated Curriculum 2020, accordingly.

The Directorate of Curriculum and Teacher Education Khyber Pakhtunkhwa constituted different committees comprising of Curriculum/Subject experts and working teachers for developing these Lesson Plans based on Curriculum 2020. DCTE acknowledges the efforts of these experts for developing and reviewing these scripted lesson Plans.

The Directorate of Curriculum and Teachers Education Khyber Pakhtunkhwa is also thankful to the Technical Assistance of Khyber Pakhtunkhwa Education Sector Programme (KESP) in the finalization of these lesson plans.

Gohar Ali Khan
Director,
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Khyber Pakhtunkhwa, Abbottabad.

Month

1

WHOLE NUMBERS



STUDENT LEARNING OUTCOMES

- Identify place values of digits up to one hundred thousand (100,000).

INFORMATION FOR TEACHERS

Teachers should know:

- That the place value for 5 – digit numbers is ones, tens, hundreds, thousands and ten thousands.
- That the largest 5 – digit number is 99,999 and the smallest 6 – digit number is 100,000.



DURATION / NO OF PERIODS: 35 MINUTES / 1 PERIOD



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils



INTRODUCTION

- The teacher should write the number “143” on the board.
- The teacher should ask students if they can write the number in expanded form. Let students raise their hands and answer.
- Show students the expanded form as $143 = 100 + 40 + 3$ on the board.
- Ask students, “How many ones does the number 143 have? How many tens and how many hundreds?”
- Give students a few minutes to think and answer.
- Tell students that 143 has 3 ones, 4 tens and 1 hundreds.
- The teacher should draw a place value chart on the board, like the one shown below:

Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones

- Write the following numbers on the board.

Randomly select students to come to the board and write the place value of each circled number on the place value chart.

- 2 (9) Correct answer: 9 ones
- (7) 1 Correct answer: 7 tens
- 8 (3) Correct answer: 3 ones
- 1 2 (3) Correct answer: 3 ones
- (2) 3 5 Correct answer: 2 hundreds

- vi. 5 **4** 0 Correct answer: 4 tens
- vii. 12 **5** 6 Correct answer: 5 tens
- viii. **4** 7 8 9 Correct answer: 4 thousands
- ix. 6 **7** 9 2 7 Correct answer: 7 thousands
- x. **9** 9 9 9 Correct answer: 9 ten thousands



DEVELOPMENT

Activity 1:

- The teacher writes the number 187654 on the board.
- Ask students to write the place value of 4,5,6,7 and 8 in their notebooks and share their answers with the class.
- Fill the place value chart for the students on the board.
- Ask the students to think what the place value of 1 is? Give them some time to discuss in pairs.
- Tell the students that the place value of 1 is hundred thousand and fill the place value chart as well.

Activity 2:

- Divide the class into pairs.
- Give each pair a flash card with a 6-digit number.
- Ensure that none of the digits are repeated for e.g. 526893.
- Ask students, in their pairs, to write the place value of each digit given on their flash card.
- Show students an example of what is expected by giving the example of 786124 on the board.

7	8	6	1	2	4
One Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones

- Conduct a class walk through and guide each pair



CONCLUSION / SUM UP

- Recap how each digit in a number has a different place value.
 - ✧ The digit to the extreme right of any number has a place value of **one**.
 - ✧ The digit to the left of the right most digit has a place value **ten** and so on.
- A place value chart may be used to align digits with their place values.



ASSESSMENT

- Ask the students to copy and match the boxes on the left with the correct answers on the right.

Number	Place value of circled digit
9 8 9 6 5 4	Hundreds
1 4 2 7 8 9	Ones
5 5 5 5	Hundred Thousands

4②0	Thousands
-----	-----------



HOMEWORK / FOLLOW UP

Assign the relevant questions from the text book on page 5.

NUMBERS UP TO HUNDRED THOUSANDS



STUDENT LEARNING OUTCOMES

- Read numbers up to one hundred thousand (100,000).
- Write numbers up to one hundred thousand (100,000).

INFORMATION FOR TEACHERS

Teachers should be able to:

1. Use a place value chart to read numbers written in numerals.
2. Write numbers up to 100,000.



DURATION / 2 LESSONS / 35 + 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Flashcards



INTRODUCTION

1. Write the following number on the board:

5 7 8 6 3 9

2. Ask students if they know how to read the number written on the board? Let a few students attempt to read the number.
3. After a few attempts, tell students that they can **read** the number by using a place value chart. Draw the place value chart as shown below and write the numbers in the correct boxes.

THOUSAND			Hundreds	Tens	Ones
100 Thousands	10 Thousands	Thousands			
5	7	8	6	3	9

4. Tell students to start from the left side and read the three numbers in the green boxes together (i.e. five hundred and seventy-eight) and add "thousand" at the end. Then ask the students to read the next three numbers in the blue boxes (i.e. six hundred and thirty-nine).
5. All together students will read the number as "five hundred and seventy eight **thousand** six hundred and thirty nine".



DEVELOPMENT

20 MINUTES

Activity 1

1. The teacher will ask students to pair up.
2. The teacher will distribute flashcards with the following numbers written on them 39167, 12634, 859821, 419562, 621963 so that every pair has at least one flashcard.
3. After a brief discussion, each pair should read out the number written on their flashcard.

If needed, other students should also guide the pair to arrive at the correct answer.



CONCLUSION

1. Ask students how they can read numbers up to 100,000 if written in numerals. Ask students to come up to the board and give examples of how they can read large numbers.
2. Students should mention that they can read numbers by using a place value chart and starting from the left.

NUMBERS UP TO HUNDRED THOUSANDS



INTRODUCTION

1. Tell students that in the previous lesson they learned how to read numbers.
2. In today's lesson students will learn how to write number up to 100,000.

Activity 2:

3. Ask the students to write down the number in numerals which the teacher will speak out loud.
4. Draw a place value chart on the board and ask students to do the same in their notebooks.
5. The teacher should say out loud "Eight Hundred and Thirty Nine thousand, One hundred and sixty seven". Repeat it slowly so the students can follow.
6. Ask a student at random to come up to the board and fill in the place value chart as the teacher says the number out loud. See the example below:

100 Thousands	10 Thousands	Thousands	Hundreds	Tens	Ones
8	3	9	1	6	7

7. Other students should do the same in their notebooks after they have attempted the question on their own.

Activity 3:

1. Ask the students to write the following numbers in numerals in their notebooks.
 - ✧ Three Hundred and Sixteen Thousand Seven Hundred and Twenty Three
 - ✧ Five Hundred and Sixty Three Thousand Two Hundred and Sixteen
 - ✧ Seven Hundred and Eighty Three Thousand Nine Hundred and Sixty Five
 - ✧ Nine Hundred and Twenty Four Thousand
2. Ask a few students to write their answers on the board and let the rest of the class help.



CONCLUSION / SUM UP

Remind students that:

1. In order to read and write numbers up to 100,000 they should use a place value chart.
2. For reading and writing a number, we start from the extreme left digit or the digit with the highest place value.



ASSESSMENT

1. Write the following numbers on the board:
 - a. 26128
 - b. 29999
 - c. 572898
 - d. 257540

e. 100000

2. Ask students to read the numbers out loud.
3. Guide students to arrive at the correct answers using a place value chart if needed.



HOMEWORK/FOLLOW UP

Assign the relevant questions from the text book on page 5.

NUMBERS IN WORDS UP TO ONE HUNDRED THOUSANDS



STUDENT LEARNING OUTCOMES

- Write numbers in words up to one hundred thousand (100,000).

INFORMATION FOR TEACHERS

The Teachers should be able:

- To know the spellings of all numbers.
- To write the numbers in words that have been written in numerals.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils



INTRODUCTION

- The teacher should write on the board the following number:
7 4 2 3 1 6
- After drawing the place value table, the teacher should ask the students to fill in the numbers in the correct boxes
- Give students a few minutes to think and then ask the students to come up to the board and fill in the table.
- The correctly filled in table should look as shown below:

THOUSAND			HUNDRED		
100 Thousands	10 Thousands	Thousands	Hundreds	Tens	Ones
7	4	2	3	1	6

- In order to write the number in words, the teacher should first read the number out loud.
- In order to do this, the three numbers in green are read together followed by the word "thousand" and then the numbers in blue are read as per usual.
- All together the number is read by the teacher as "Seven Hundred and Forty Two **Thousand** Three Hundred and Sixteen".
- Ask students to write the number in words using the correct spellings.
- After reviewing student responses, the teacher should write the number in words on the board using the correct spellings.



DEVELOPMENT

Activity 1:

1. Write the following numbers on the board and ask the students to write them in words.
 - a. 479,231
 - b. 659,789
 - c. 825,141
 - d. 963,528
2. Give them some time to complete their work.
3. Write the spellings of the numbers on the board which are frequently asked by the students.
4. Ask a few students to read out their answers to the class and guide them to arrive at the correct answers.



CONCLUSION / SUM UP

1. Remind students that:
 - ✧ In order to write a number in words, it is important to first read it out loud.
 - ✧ For reading and writing a number we start from the extreme left digit or the digit with the highest place value.



ASSESSMENT

1. Ask students to copy and complete the following table:

Numbers in Numerals	Numbers in Words
286,543	
	Nine hundred and eighty one thousand, six hundred
481500	
	Three hundred and fifty six thousand, four hundred and twenty two



HOMEWORK/FOLLOW UP

Assign the relevant questions from the text book on page 5.

COMPARING AND ORDERING NUMBERS



STUDENT LEARNING OUTCOMES

- Compare and order numbers up to 5 – digit

INFORMATION FOR TEACHERS

Teachers should be able:

- To know the place value for 5 – digit numbers is ones, tens, hundreds, thousands, and ten thousands.
- To order numbers based on place values.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Flash Cards



INTRODUCTION

- Ask students the following questions. Students will raise their hands to answer.
- Write examples given by the students, in 4 columns, on the board.
 - Which is the smallest 1-digit number? Which is the largest 1-digit number?
 - Which is the smallest 2-digit number? Which is the largest 2-digit number?
 - Which is the smallest 3-digit number? Which is the largest 3-digit number?
 - Which is the smallest 4-digit number? Which is the largest 4-digit number?
 - Which number comes after the largest 4 digit number? Guide students to arrive at 10000.



DEVELOPMENT

Activity 1

- Draw the following table on the board:

T.TH	TH	H	T	O

- Ask 5 different students to write a digit from 1–9 in each of the empty boxes.
- Let's say the number is 2 1 5 4 7.
- Choose a second number such that the Ten Thousands, Thousands and Hundreds digits are the same for both numbers and the Tens and Ones are smaller.

- Let's say the 2nd number is 2 1 5 3 8. Write the number in the second row of the table.
- Ask the students which number is bigger/greater and why. Give students a few minutes to discuss their answers in pairs.
- Explain to the students that in order to determine which number is bigger, we start the comparison with the digit with the greatest place value i.e., the Ten Thousands digit. If both the digits are the same, we move to the digit with the second largest place value i.e., the thousands digit and so on until one number is larger / smaller than the other.
- In other words, to compare numbers, compare digits from left to right until you find two different digits.
- Therefore 2 1 5 4 7 is bigger/greater than 2 1 5 3 8 because 4 is greater than 3.

Activity 2:

- Divide students in groups of 5 and give each student one flashcard with a digit from 1-9 written on it.
- Ask the students to make the largest 5-digit number that they can using the flashcards and record it on a piece of paper.
- Now ask the students to make the smallest 5-digit number that they can using the flashcards and record it on a piece of paper.
- Each group should come up to the front of the class and show the largest and smallest numbers they made.
- Let the class give feedback to each group in an orderly manner.
- Guide each group when needed.



CONCLUSION / SUM UP

- Recap that in order to decide which number is greater or smaller we first look at the digits with the largest place value. If those digits are the same, then we move to the digit with the second largest place value until we get to the digit with the unit place value which is not the same for e.g., 5 7 1 2 3 is larger than 5 7 1 2 2 because 3 is larger than 2.



ASSESSMENT

- Copy and complete the following table.
- Briefly explain students that 'greater than' means 'bigger than' and 'less than' means 'smaller than'.

Circle the Correct Answer			
6 2 3 7 5	Greater than	Less than	3 4 2 1 8
8 3 2 1 7	Greater than	Less than	1 3 4 7 5
7 0 5 1 2	Greater than	Less than	9 2 0 3 7



HOMEWORK/FOLLOW UP

Assign the relevant questions from the textbook on page 8.

ADDITION OF REAL LIFE NUMBER STORIES



STUDENT LEARNING OUTCOMES

1. Add numbers up to 5-digit.
2. Solve real life number stories involving addition of numbers up to 5-digit.

INFORMATION FOR TEACHERS

Teachers should be able to:

1. Add numbers i.e., align the ones digit with the ones digit, the tens with the tens and so on.
2. Carry when doing addition of numbers.



DURATION / NO OF PERIODS: 2 LESSONS / 35 + 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Flash Cards with 5-digit numbers.



INTRODUCTION

1. Write the following question on the board:
The electricity bill for this month was Rs. 12,820 and the gas bill was Rs. 10,357. How much money is needed to pay both bills?
2. Draw a grid like the one shown below. Ask one of the students to write 12,820 with correct placement in the place value chart.
3. Ask another student to write 10,357 below the first number.

	Ten Th	Th	H	T	O
	1	2	8	2	0
+	1	0	3	5	7
<hr/>					
<hr/>					

4. Ask a student to carry out addition starting with the ones-digit, the tens-digit, hundreds-digit, thousands-digit and then ten thousand-digit.
5. Guide the students that in addition we add ones with ones, tens with tens, hundreds with hundreds, thousands with thousands and ten thousands with ten thousands.

- Pay special attention while adding the hundreds and thousands digits as carrying must be done during addition here.
- Discuss with students how after addition the total amount is Rs. 23,177 with the following working. See below:

	Ten Th	Th	H	T	O
		1			
	1	2	8	2	0
+	1	0	3	5	7
	2	3	1	7	7



DEVELOPMENT

Activity 1:

- Ask students to work in pairs
- Copy and complete the following question.
 - Adnan purchased a refrigerator for Rs. 36,510 and a television for Rs. 23,430. How much does Adnan have to pay?
- Ask pairs to come to the board and share their solutions.
- Ask other students to give their input as well.
- After all students have attempted the question, show the correct solution as shown below:

	Ten Thousands	Thousands	Hundreds	Tens	Ones
	3	6	5	1	0
+	2	3	4	3	0
	5	9	9	4	0

Lesson 6 Conclusion/Sum up:

- Ask students how we carry out the addition of 5-digit numbers with 5-digit numbers. Students should highlight that in addition we add ones with ones, tens with tens, hundreds with hundreds, thousands with thousands and ten thousands with ten thousands.

ADDITION OF REAL LIFE NUMBER STORIES



INTRODUCTION

- Tell students that in this lesson we will do some more practice of addition of 5-digit numbers with 5-digit numbers.

Activity 2:

- Distribute flashcards among students. Each flashcard should have a 5-digit number on it.
- Give two different flashcards to each student.
- Tell them to add the two numbers written on their flashcards and show their working to the student sitting next to them for peer review.
- If a student finishes early, the teacher should give that student two new flashcards.
- The teacher should walk through the class and guide students to arrive at the correct answers.



CONCLUSION / SUM UP

- Ask students to recap the steps involved in the addition of 5-digit numbers.
- Highlight that for addition we add ones with ones, tens with tens, hundreds with hundreds, thousand with thousand and ten thousands with ten thousands.



ASSESSMENT

- Ask students to copy and complete the following questions in their notebooks:

a)

	Ten Th	Th	H	T	O
	5	8	1	3	4
+	2	5	3	6	7
<hr/>					
<hr/>					

b)

	Ten Th	Th	H	T	O
	7	1	3	5	2
+	2	6	4	3	5
<hr/>					
<hr/>					

2. At the end of January, Amjad made a deposit of Rs. 60,724 in his bank account. At the end of February Amjad deposited Rs. 11,637 more in his account. What was the total amount that he deposited?



HOMEWORK/FOLLOW UP

Assign the relevant questions from the textbook on page 16.

ADDITION OF REAL LIFE NUMBER STORIES



STUDENT LEARNING OUTCOMES

- Subtract numbers up to 5-digit.
- Solve real life situation involving subtraction of numbers up to 5-digit.

INFORMATION FOR TEACHERS

1. Teachers should be able to align two 5-digit numbers and carry out subtraction i.e., one's digit should be aligned with one's digit, tens with tens and so on.



DURATION / NO OF PERIODS: 1 LESSONS / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Flashcards with 5-digit numbers.

Introduction:

1. Ask students to work in pairs and solve $69452 - 47673$ in their notebooks.
2. Encourage pairs to come to the board and share their solutions.
3. Write the solution on the board as shown below. Explain each step to the students and highlight why we need to borrow.

	Ten Thousand	Thousand	Hundred	Ten	Ones
				4	1
	6	9	4	5	2
–	4	7	6	7	3
					9

	Ten Thousand	Thousand	Hundred	Ten	Ones
			3	14	1
	6	9	4	5	2
–	4	7	6	7	3
				7	9

	Ten Thousand	Thousand	Hundred	Ten	Ones
		8	13	14	1
	6	8	4	5	2
–	4	7	6	7	3
			7	7	9

	Ten Thousand	Thousand	Hundred	Ten	Ones
		8	13	14	1
	6	8	4	5	2
–	4	7	6	7	3
		1	7	7	9

	Ten Thousand	Thousand	Hundred	Ten	Ones
		8	13	14	1
	6	9	4	5	2
–	4	7	6	7	3
	2	1	7	7	9



DEVELOPMENT

Activity 1:

1. Prepare flashcards for the class with 5-digit numbers written on them for e.g., 75895, 62437, 99712 etc. Put these flash cards into a basket.
2. Divide the class into pairs and ask each pair to pick two flash cards from the basket.
3. Ask each pair to find the difference between the two numbers.
4. After students have solved their problems, remind them that for subtraction it is important to place the bigger number on the top and the smaller number at the bottom.
5. Students who finish early should come to the basket and pick two more flash cards.
6. Walk around the class to provide guidance and give feedback to students as they carry out subtraction.

Activity 2:

1. Write the following real life story on the board.
2. Hashir has collected Rs. 25450. He bought a mobile phone for Rs. 11200. How much money is left with him after the purchase?
3. Ask students to read the question and then solve it in pairs.
4. Ask a few pairs to come to the board and write their working on the board.
5. The teachers should guide students through each step and show that the final answer is Rs. 14250.



CONCLUSION / SUM UP

1. Conclude the lesson by asking students to explain the steps involved in the subtraction of 5-digit numbers.
2. The key points to look for are:
 - ✧ alignment of digits
 - ✧ writing the larger number on top
 - ✧ carry out borrowing where necessary.
3. Reinforce the concept of borrowing if needed.



ASSESSMENT

1. Write the following question on the board and asks the students to solve it in their notebooks.
2. Walk through the class and assist students where necessary.

	Ten Thousand	Thousand	Hundred	Ten	Ones
	7	5	9	1	4
–	5	7	1	2	5
<hr/>					
<hr/>					



HOMEWORK/FOLLOW UP

Assign the relevant questions from the textbook in Exercise 1 on page 19.

REAL LIFE NUMBER STORIES – SUBTRACTION



STUDENT LEARNING OUTCOMES

- Solve real life situations involving subtraction of numbers up to 5-digit.

INFORMATION FOR TEACHERS

Teachers should be able:

- Be able to align two 5-digit numbers and carry out subtraction i.e. ones digit should be aligned with ones digit, tens with tens and so on.
- Know that the larger number should be written in the top row and the smaller number should be written in the bottom row. For e.g. $69452 - 47673$ should be done as follows:

	Ten Thousand	Thousand	Hundred	Ten	Ones
		8	13	14	1
	6	9	4	5	2
–	4	7	6	7	3
	2	1	7	7	9



DURATION / NO OF PERIODS: 1 PERIOD / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils



INTRODUCTION

- Tell the students that Rabia's father has a salary of Rs. 26,128. He gave Rs. 15,000 to Rabia's mother for home expenses. How much amount is still left with him?
- Ask the students which number should be written on the top and which number should be written at the bottom in the place value chart for subtraction. Emphasize that the bigger/greater number should always be written on the top for subtraction.
- Draw a place value chart on the board and write 26,128 at the top and 15,000 below it.
- Ask the students one by one to carry out the subtraction of ones-digit, tens-digit, hundreds-digit, thousands-digit and ten thousand- digit.
- The teacher will show the students each step and arrive at the total amount of 11,128 after subtraction.



DEVELOPMENT

Activity 1:

Write the following questions on the board and ask the students to answer them in their notebooks. Guide students through each step to arrive at the correct answers mentioned below.

- Aslam purchased wheat for Rs. 68,270 and sold it for Rs. 52,500. What was his loss?

	Ten Thousand	Thousand	Hundreds	Tens	Ones
		7	1		
	6	8	2	7	0
–	5	2	5	0	0
	1	5	7	7	0

- A salaried person makes Rs. 18,355 every month. He gets a salary raise and checks his account and finds Rs. 20,750. How much more money is he getting every month?

	Ten Thousand	Thousand	Hundred	Ten	Ones
	1	1	6	14	1
	2	0	3	5	0
–	1	8	3	5	5
		2	3	9	5



CONCLUSION / SUM UP

- Conclude the lesson by asking students to explain the steps involved in the subtraction of 5 digit numbers.
- The key points to look for are:
 - ✧ alignment of digits
 - ✧ writing the larger number on top
 - ✧ to carry out borrowing where necessary.
- Reinforce the concept of borrowing.



ASSESSMENT

Students should attempt the following question in their notebooks:

- A farmer has collected Rs. 85,405. He bought a computer costing Rs. 45,200. How much money is left with the farmer after the purchase?



HOMEWORK/FOLLOW UP

Assign the relevant questions from the textbook in Exercise 1 on page 20.

MULTIPLICATION AND DIVISION



STUDENT LEARNING OUTCOMES

1. Multiply numbers up to 5-digit by numbers up to 3-digit.
2. Solve real life situations involving multiplication of numbers up to 5-digit by 3-digit.

INFORMATION FOR TEACHERS

Teachers should be able to:

1. Align and set up multiplication questions.
2. Carry while doing multiplication problems.



DURATION / NO OF PERIODS: 2 LESSONS / 35 + 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Flashcards with 5-digit and 3-digit numbers written on them



INTRODUCTION

1. Write the following word problem from real life situation on the writing board.
A shopkeeper bought 356 mobiles from a wholesale shop at Rs 12,590 each. How much did he pay in total to buy the mobiles?
2. Ask students to think about this question and how they would go about answering it. Give students a few minutes to brainstorm and then raise their hands and give their input.
3. Record student responses on the board.
4. Ask students if the final answer be a large number or a small number? Why?
5. Encourage students to say, "multiply", "times" and even "product".
6. Draw a place value chart on the board and write 12,590 in the first row and 356 in the second row. Introduce the million-digit as the one which comes after hundred thousand.
7. Ask a student to come to the board and multiply 6 with 12,590 to reach the answer below. Encourage other students to help when needed.

Mil	Hun Th	Ten Th	Th	H	T	O
		1	3	5		
		1	2	5	9	0
	x			3	5	6
		7	5	5	4	0

8. Ask another student to multiply 12,590 with 50. This is the same as multiplying 12,590 with 5 and then adding a 0 at the end of the number.

Mil	Hun	Th	Ten	Th	H	T	O
			1	2	4		
			1	3	5		
			1	2	5	9	0
	x				3	5	6
<hr/>							
			7	5	5	4	0
	6		2	9	5	0	0
<hr/>							

9. Ask another student to multiply 12,590 with 300. This is the same as multiplying 12,590 with 3 and then adding two 0s at the end of the number.

Mil	Hun	Th	Ten	Th	H	T	O
				1	2		
			1	2	4		
			1	3	5		
			1	2	5	9	0
	x				3	5	6
<hr/>							
			7	5	5	4	0
	6		2	9	5	0	0
3	7		7	7	0	0	0
<hr/>							

10. Ask another student to add all three terms and share the answer with the class.

Mil	Hun Th	Ten Th	Th	H	T	O
			1	2		
		1	2	4		
		1	3	5		
<hr/>						
		1	2	5	9	0
	x			3	5	6
<hr/>						
1	1	2	1			
<hr/>						
		7	5	5	4	0
	6	2	9	5	0	0
3	7	7	7	0	0	0
<hr/>						
4	4	8	2	0	4	0
<hr/>						

Activity 1:

- Ask the students to do the following question in their notebooks.
A sweet factory produces 54,520 toffees in a day. How many toffees will be produced in 250 days?
- Ask the students to work in pairs to answer the question.
- Ask a few students to voluntarily and solve the question on the board. Help students arrive at the following answer.

Ten M	Mil	Hun Th	Ten Th	Th	H	T	O
				1			
			2	2	1		
<hr/>							
			5	4	5	2	0
	x				2	5	0
<hr/>							
	1		1				
<hr/>							
			0	0	0	0	0
	2	7	2	6	0	0	0
1	0	9	0	4	0	0	0
<hr/>							
1	3	6	3	0	0	0	0
<hr/>							

Lesson 10 Conclusion:

- Ask students how we multiply 5-digit numbers by 3-digit numbers. Students should highlight the importance of aligning and setting up multiplication questions. Students should also mention when to add the zeroes at the end of the numbers during multiplication and when to carry while doing multiplication problems.

MULTIPLICATION AND DIVISION



INTRODUCTION

1. Tell students that in today's lesson we will practice multiplication of 5-digit numbers with 3-digit numbers some more to develop proficiency.

Activity 2:

1. Distribute flashcards among students.
2. Each flashcard should have a 5-digit number and a 3-digit number on it.
3. Each student should be given a different flashcard (see sample flashcard below).
4. Ask the students to multiply the two numbers written on their flashcard and show their working to the student sitting next to them for peer review.
5. If a student finishes early, the teacher should give that student a new flashcard.
6. Walk through the class and guide students to arrive at the correct answers.

Sample Flashcard

6	2	5	4	0
×		3	2	1



CONCLUSION / SUM UP

1. Conclude the activity by asking the students to recap the steps in the multiplication of 5-digit numbers with 3-digit numbers:
 - ✧ placing the bigger number on top and the smaller at the bottom
 - ✧ adding the right number of zeroes when multiplying with tens, hundreds and so on.
2. Remind students that while doing addition, we add ones with ones, tens with tens, hundreds with hundreds, thousands with thousands and ten thousands with ten thousands.



ASSESSMENT

1. Ask the students to copy and complete the following questions in their notebooks:

a)	Ten Th	Th	H	T	O
	4	3	2	7	3
	×		2	5	1

b)	Ten Th	Th	H	T	O
	7	8	5	3	2
	x		1	9	7

-
2. After students have attempted the question share the correct solutions with them on the writing board.



HOMEWORK/FOLLOW UP

Assign the relevant questions from the textbook on page 25.

Month

2

REAL LIFE SITUATIONS – DIVISION



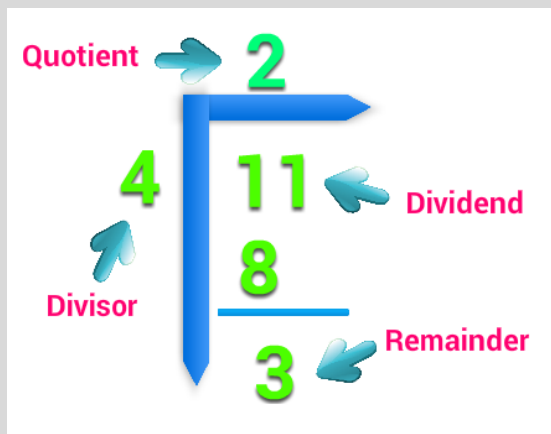
STUDENT LEARNING OUTCOMES

1. Divide numbers up to 4-digit by numbers up to 2-digit
2. Solve real life situations involving division of numbers up to 4-digit by a number up to 2-digit.

INFORMATION FOR TEACHERS

Teachers should be able:

1. To set up and carry out long division.
2. To Understand the terms divisor, dividend, quotient and remainder, and use them while doing division problems.



DURATION / NO OF PERIODS: 2 LESSONS / 35 + 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils



INTRODUCTION

Write the following word problem from a real-life situation on the writing board.

A cricket team of 12 players has just won a local cricket tournament and was awarded a cash prize of Rs. 6,600. The coach wants to distribute this amount equally among the 12 players. How much money will each player receive?

1. Ask students how they will find the cash prize per player. Encourage students to use expressions like “divide equally”, “divide 6660 by 12”, “12 should be the divisor” etc.
2. Set up the question as shown below. Tell students that 6660 is the dividend and 12 is the divisor.

$$\begin{array}{r}
 0 \\
 12 \overline{) 6660}
 \end{array}$$

3. Ask students, "Can 6 be divided by 12?"
4. Students should reason that 6 cannot be divided by 12 as 6 is smaller than 12. Tell students, therefore we put a 0 (shown in blue).
5. Now ask students, "Can 66 be divided by 12?" Give students a few minutes to think about this and ask students to recite the 12 times table to guide their thinking.
6. Students should say that 66 is divisible by 12 as 12 times 5 is 60. Write 5 and 60 in the appropriate positions.

$$\begin{array}{r}
 0 \quad 5 \\
 12 \overline{) 6660} \\
 \underline{- 60} \\
 06
 \end{array}$$

7. Tell students that the next step is to subtract 60 from 66 to get the remainder of 6.
8. The question is not yet solved. Ask students what the next step should be? Students should say that the next step is to bring down the 6 as shown below and continue the long division. Again the remainder is 6.

$$\begin{array}{r}
 0 \quad 5 \quad 5 \\
 12 \overline{) 6660} \\
 \underline{- 60} \downarrow \\
 066 \\
 \underline{- 60} \\
 06
 \end{array}$$

9. Students should further add that in the next step the 0 is brought down and after subtraction, the remainder is 0.

$$\begin{array}{r}
 \begin{array}{cc} 1 & 2 \end{array} \overline{) \begin{array}{cccc} 0 & 5 & 5 & 5 \\ 6 & 6 & 6 & 0 \\ \hline 6 & 0 & & \\ \hline 0 & 6 & 6 & \\ - & 6 & 0 & \\ \hline & 0 & 6 & 0 \\ & - & 6 & 0 \\ & & \hline & & 0 & 0 \end{array}
 \end{array}$$

10. Tell students when 6660 is divided by 12 the quotient or the answer is 555.
 11. Ask students how much will each of the 12 players receive from the cash prize of 6660?
 12. Encourage students to answer. The correct answer is that each player receives Rs. 555 from the cash prize.



DEVELOPMENT

Activity 1

- Write the following question on the board.
In a camp, 8,575 children are divided into groups. There are 25 children in each group. Find the total number of groups at this camp?
- Divide the students into small groups.
- Ask each group to solve the question neatly in one notebook.
- Ask various groups at random to present their solution at the front of the class.
- Other students should listen attentively and give their feedback.
- Assist the groups to reach the correct answer by setting up the question as follows:

$$\begin{array}{r}
 \begin{array}{cc} 2 & 5 \end{array} \overline{) \begin{array}{cccc} 8 & 5 & 7 & 5 \end{array}
 \end{array}$$



CONCLUSION / SUM UP

- Ask students what are the steps in setting up a division question.
- How do we know we have gotten the answer?
- Where do we write the divisor? Where do we write the dividend? Where does the quotient appear?
- Help students to recap the key takeaways from the 1st Lesson.

REAL LIFE SITUATIONS - DIVISION



INTRODUCTION

1. Remind students about the key steps in long division. Show students the dividend, divisor, quotient, and the remainder in a division question.
2. Recap the key steps in Activity 1 e.g. "How did we set up the question?", "Could we divide 8 by 25?"
3. If not, what did we do as the next step?
4. When did we know that we have our final answer?
5. Guide student discussion and ensure that students are on the same page

Activity 2:

1. Write the following questions on the board and ask the students to copy and solve in their notebooks.
2. Divide the following 4-digit numbers by 2-digit numbers
 - ✧ $4224 \div 16$
 - ✧ $1560 \div 12$
 - ✧ $3816 \div 24$
 - ✧ $8028 \div 36$
 - ✧ $1768 \div 13$
3. Walk across the classroom and guide students.



CONCLUSION / SUM UP

Conclude the activity by involving the students in recapping the steps in the division of 4 digit numbers with 2 digit numbers.

1. It is important to recall that while doing division, the answer is the quotient or the number written on top.
2. Tell students to pay special attention to which numbers have to be brought down and when to subtract while doing division.



ASSESSMENT

Ask the students to copy and solve the following questions in their notebooks.

1. Solve

$$\begin{array}{r} 2 \ 2 \overline{) 8 \ 8 \ 4 \ 4} \end{array}$$
2. Solve $3198 \div 82$
3. The total number of students in a school is 2575. If 25 students are to be seated in each classroom, how many classrooms are required to seat all the students?



HOMEWORK / FOLLOW UP

Assign the relevant questions from the textbook on page 29.

REAL LIFE SITUATIONS – DMAS



STUDENT LEARNING OUTCOMES

- Solve real life situations using appropriate operations of addition, subtraction, multiplication and division of numbers up to 2-digit.

INFORMATION FOR TEACHERS

Teachers should be able:

- To understand all the steps involved in carrying out the operations of addition, subtraction, multiplication and division.
- To extract relevant information from word problems and carry out the correct operation(s) for a given real life problem.



DURATION / NO OF PERIODS: 2 LESSONS / 35 + 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Question Slips, Chart



INTRODUCTION

- Write the following question on the board.
One packet of *kebabs* has 7 pieces in it. The price of one pack is Rs. 218. Ali buys 8 packs to cook at a barbecue lunch.
 - How many total pieces of *kebabs* did Ali buy?
 - What was the total cost of the *kebabs*?
 - How much change does Ali get if he gives the shopkeeper Rs. 2,000?
- Divide the class into small groups of 3 students each.
- Ask each group to discuss the questions amongst themselves and then come up with the answers.
- Help the groups to arrive at the correct answers.
- Ask a student from each group to come to the board and write their answer for the first part.
- Solve the first part of the question on the board.
- Follow the same steps for the next parts. See the solution below.
 - How many total pieces of kebabs did Ali buy? $7 \times 8 = 56$ pieces
 - What was the total cost of the kebabs? $218 \times 8 = \text{Rs. } 1,744$

Th	H	T	O
	1	6	
	2	1	8
x			8
1	7	4	4

- ✧ How much change does Ali get if he gives the shop keeper Rs. 2,000?

$$2000 - 1744 = 256 \text{ Rupees}$$

	Th	H	T	O
	1	19	19	1
	2	0	0	0
-	1	7	4	4
		2	5	6



DEVELOPMENT

Activity 1:

1. Divide the class into groups of 4.
2. Give each student in the group a flashcard with one of the following 4 questions written on it.
3. Ask students to attempt their question and then pass on the question slip to the next student within their own group.
4. By the end of the rotation of slips, each student should have answered all 4 questions.
5. Student may discuss within their group.
 - ✧ In February the gas bill for Faheem's house was Rs. 6,457 and in March it was Rs. 4,923. What was the total bill for the two months? How much less was the bill for March?
 - ✧ The library in Peshawar has 875 Mathematics books and the library in Abbottabad has 643 Mathematics books. What is total number of Mathematics books that both libraries have? How many more Mathematics books does the Peshawar library have?
 - ✧ In a camp, 345 students are divided into equal groups of 15 children each. What is the total number of groups?
 - ✧ An inspection officer notices that there are 25 students present in each classroom. If there are 13 classrooms in that school. How many students are present in the school?



CONCLUSION

1. Tell students to copy any unfinished questions in their notebooks and individually complete all 4 questions and bring them to the next lesson.

REAL LIFE SITUATIONS – DMAS**INTRODUCTION**

1. Ask students to voluntarily and come up to the writing board and solve each question. Ask other students to also give their input.
2. Share the correct answers with the students by displaying the answers on a chart prepared prior to lesson 2.

**CONCLUSION / SUM UP**

1. Remind students that addition, subtraction, multiplication and division come up frequently in everyday life.
2. Ask the students that it is important to read the question carefully in order to determine which operation shall be used to solve the question.
3. Tell students that they must be careful while doing addition, subtraction, multiplication and division. They must align ones with ones, tens with tens and so on. Students must also practice when and how to borrow / carry while doing different operations.

**ASSESSMENT**

Write the following questions on the board. Ask students to raise their hands and state the operations to be carried out in each question.

1. Asim receives Rs. 1500 from his *baba* and Rs. 570 from his *dada*. How much money does he have in total? Correct answer: Add 1500 and 570
2. He goes to the sports shop to buy balls for cricket. Cricket balls come in packs of 3 and cost Rs. 360. How much does each cricket ball cost? Correct answer: Divide 360 by 3.
3. He also wants to buy insulation tape. Insulation tape costs Rs. 60. He wants to buy 5. How much will this cost him? Correct Answer: Multiply 60 by 5.
4. What is the total cost to Asim if he buys 3 packs of cricket balls and 5 insulation tapes? Correct answer: Multiply 360 by 3. Multiply 60 by 5. Add both answers ($1080+300=1380$)
5. How much money will Asim have after his purchases? Correct Answer: subtract 1380 from 2070.

**HOMEWORK / FOLLOW UP**

Assign the relevant questions from the textbook on page 35.

PATTERNS



STUDENT LEARNING OUTCOMES

1. Recognize a given increasing and decreasing pattern by stating a pattern rule.
2. Describe the pattern found in a given table or chart.

INFORMATION FOR TEACHERS

The teacher should be able to:

1. Identify trends in various patterns.
2. Find / identify the missing terms within a pattern.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Chalk, Marker, Textbook, Notebooks, Chart



INTRODUCTION

1. Read the table of 4 out loud. "4 ones are 4, 4 twos are 8..."
2. After completing the table till "4 tens are 40" ask the students to join in the second round.
3. Tell the students to say the answers out loud "4, 8, 12, 16, 20, 24, 28..."
4. Ask students how they knew which number would come next?
5. Give students a few minutes to discuss and share their answers.
6. Explain to students how every times table follows a pattern where the difference between each number is the same.
7. Write the table of 4 on the board for the students to see the difference of 4. Ask students to come up with the **rule of the pattern?** Or how the numbers are related to each other. Let students think for a few minutes and share their ideas.
8. Tell students that for "4, 8, 12, 16, 20, 24..." the rule of the pattern is "the next number is 4 more than the previous number".
9. Tell students that we will be discussing patterns today.



DEVELOPMENT

Activity 1:

1. Write the following question on the board and explain it to the students:
An active student is on the 3rd floor (each floor has 10 steps) of a building and decides to run down the staircase by skipping over each alternate step.
If he is currently standing on the 30th step, write down each step number that he lands on.

- Write the first few numbers in the sequence on the board i.e. 30, 28, 26.
- Ask students to write the remaining numbers in their notebooks.
- Guide students to the correct answer mentioned below:
30, 28, 26, 24, 22, 20, 18, 16, 14, 12, 10, 8, 6, 4, 2, 0
- Ask the students to discuss in pairs if they see any pattern.
- Help students identify the pattern: the difference between any two consecutive numbers is 2.
- Ask students to complete the following sentence:
The rule of the pattern is:
The next number is the previous number _____

Activity 2:

- Draw the following table on the board and ask the students to copy and complete the table.
- Explain that the students have to write the rule of the pattern for each pattern.

#	Fill in the blanks	The rule of the pattern is...
i.	5, 8, 11, 14, ____, ____	The next number is the previous number plus 3
ii.	1, 5, 9 ____, 17, 21, ____	
iii.	19, 17, 15, 13, ____, ____	
iv.	9, 18, 27, ____, ____, 54	
v.	104, 94, ____, 74, 64, ____	



CONCLUSION / SUM UP

- Recap the lesson by asking students to list the features of a sequence or pattern?
- Ask students the following questions:
How are items related to each other in a pattern?
How do we find the missing items in a pattern?
How do we make predictions about the next numbers in a pattern?



ASSESSMENT

- The chart shown below should be prepared and pasted on the wall prior to the lesson.

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

- ✧ What is the rule for the pattern in green if the first term is 41?
- ✧ What is the rule for the pattern in blue if the first term is 4?
- ✧ What is the rule for the pattern in red if first term is 10?
- ✧ What is the rule for the pattern in yellow if the first term is 91?



HOMEWORK/FOLLOW UP

Assign the relevant questions from the textbook on page 32-33.

NUMBER SEQUENCE



STUDENT LEARNING OUTCOMES

- Complete the given increasing and decreasing number sequence

INFORMATION FOR TEACHERS

The teacher should be able to:

1. Predict terms in a given sequence / pattern of numbers.
2. Identify missing terms in a given sequence / pattern of numbers.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Chalk, Marker, Textbook, Notebooks, Chart



INTRODUCTION

1. Ask students which numbers would come next?
2. Say the following number pattern slowly but loudly to the class.
"24, 22, 20, 18, 16 ... "
3. Ask the students to join in by predicting the next numbers.
4. Students should say out loud "16, 14, 12, 10, 8, 6, 4, 2, 0."
5. Divide the students into small groups.
6. Give students a few minutes to discuss in their groups and then explain to the entire class how the number sequence follows a pattern where the difference between each number is 2.
7. Encourage the groups to come up with a different pattern.
8. Tell students that we will be elaborating on patterns today.



DEVELOPMENT

Activity 1:

1. Paste the chart shown below on the writing board.
2. Ask students to work in the same groups as earlier.
3. Ask the students in a group to copy and complete the table given below in their notebooks.
4. Explain to the students in a group that they need to write the rule of the pattern for each pattern.
5. Discuss the first example to remind students what the rule of the pattern is.

6. Discuss the correct answers with the whole class on the board after receiving responses from different groups.

#	Fill in the blanks	The Rule of the pattern is
i.	5, 11, 17, ____, ____	The next number is the previous number plus 6
ii.	17, 12, ____, 2	
iii.	19, 15, 11, ____, ____	
iv.	9, 27, ____, 63	
v.	184, 204, ____, 244, 264, ____	



CONCLUSION / SUM UP

- Let students discuss the question below in the same small groups as earlier.
- Ask students, "In a pattern how are items related to each other?
How do we find the missing items in a pattern? How do we make predictions as to the next items in a pattern?"
- The teacher should guide them to the correct answer.



ASSESSMENT

The chart shown below should be prepared and pasted on the wall / writing board prior to the lesson

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

- What is the rule for the pattern in green if the first term is 1 (next term is 12)?
- What is the rule for the pattern in blue if the first term is 91 (next term is 82)?
- What is the rule for the pattern in red if the first term is 5 (next term is 16)?
- What is the rule for the pattern in yellow if the first term is 71 (next term is 62)?



HOMEWORK/FOLLOW UP

Assign the relevant questions from the textbook on page 32-33.

Month

3

DIVISIBILITY RULES



STUDENT LEARNING OUTCOMES

1. Identify divisibility rules for 2, 3, 5, and 10.
2. Use divisibility tests for 2, 3, 5 and 10 on numbers up to 5 digits.

INFORMATION FOR TEACHERS

The teachers should know the divisibility rules for 2, 3, 5, and 10 as outlined in the book.



DURATION / NO OF PERIODS: 2 LESSONS / 35 + 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Chart Paper with the divisibility rules of 2, 3, 5 and 10 displayed in class.



INTRODUCTION

1. Tell students that there are 51 students in a class, and they have to make groups of 3 students each. Ask students, "Will you be able to make complete groups with equal number of students?"
2. Give students an opportunity to raise their hands and give an answer.
3. If students use long division and show that $51 \div 3 = 17$ with 0 remainder then accept the answer.
4. If the students are not able to answer, do the long division on the writing board.
5. Ask students "does anyone know of a shortcut to solve this without doing the long division?"
6. After their responses, tell students the divisibility rule for 3 i.e., if the sum of all digits of a number is divisible by 3 then the number is also divisible by 3.
7. In this case $5 + 1 = 6$ and as $6 \div 3$ then $51 \div 3$ as well.



DEVELOPMENT

Activity 1:

1. Write the following real-life example on the writing board and read it out for students.
15 students who are present in a playground want to play a football match. Can they make 2 equal teams?
2. Let students discuss the answer in pairs.
3. Ask a few pairs to share their answers with the class.
4. Do the long division on the board and show the remainder is 1.

5. Explain to the students that the teams will be unequal as 15 is not equally divisible by 2 and leaves 1 player without any group.
6. Ask students to think what the divisibility rule for 2 can be.
7. Tell students the divisibility rule for 2 i.e., if the digit in the ones place is 0, 2, 4, 6, or 8 then the number is divisible by 2.
8. Draw the place value chart and write 15 in it to show that 5 lies in the Ones place and is not divisible by 2. Hence 15 is also not divisible by 2.

Activity 2:

1. Draw the following table on the board and ask students to copy the table in their notebooks.
2. Ask a student to come to the board and attempt the first row. Ask another student to come on the board and attempt the second row.
3. Help the students to correctly fill the table. Let the rest of the class help as well.
4. Ask the students to complete the rest of the table in their notebooks.

#	Number	Divisible by 2	Divisible by 3
1	35716	✓	X
2	13725	X	✓
3	1462		
4	754		
5	1538		
6	4773		
7	99999		



CONCLUSION

Ask students to state the divisibility rule for 2 and 3. Students should highlight that if the digit in the ones place is 0, 2, 4, 6, or 8 then the number is divisible by 2 and if the sum of all digits of a number is divisible by 3 then the number is also divisible by 3.

DIVISIBILITY RULES



INTRODUCTION

1. Tell students to re-cap the divisibility rules for 2 and 3.
2. Record these responses on the board.
3. Tell students that in today's lesson we will be discussing the divisibility rules for 5 and 10.

Activity 3:

1. Write and explain the following example on the board for the students.
A mother has five children. She wants to equally distribute 28 sweets among them. Will she be able to distribute these sweets equally among her children?
2. Ask a few students to answer the question.
3. Do the long division on the board to show that the remainder is 3 and hence the mother cannot distribute the sweets equally among her 5 children.
4. Ask the students to think about how many more sweets are needed to distribute equally.
5. Acceptable responses are 2, 7, 12... as then the number of sweets will be 30, 35, 40...
6. Ask students "what is it about 30, 35, 40, 45 that makes these numbers divisible by 5?"
7. After taking a few responses from the students, tell them that the divisibility rule for 5 is that if the digit at the Ones place is 0 or 5 then the number is divisible by 5.
Similarly for 10, if the digit at the ones place is 0 then the number is divisible by 10.
8. Write these two divisibility rules on the board.

Activity 4:

1. Draw the following table on the board and ask students to copy it in their notebooks.
2. Ask a student to come to the board and attempt the first row. Ask another student to come to the board and attempt the second row.
3. Help the students to correctly fill the table. Let the rest of the class help as well.
4. Ask the students to complete the rest of the table in their notebooks.

#	Number	Divisible by 5	Divisible by 10
1	12345	✓	X
2	67890	✓	✓
3	5555		
4	37410		
5	10		
6	8749		



CONCLUSION / SUM UP:

1. Ask students the following questions to recap the divisibility rules:

- ✧ What makes a number divisible by 2?
- ✧ What makes a number divisible by 3?
- ✧ What makes a number divisible by 5?
- ✧ What makes a number divisible by 10?

2. Share the correct rules with examples with the students after taking student responses.



ASSESSMENT

1. Draw the following table on the writing board and ask students to copy and complete using the divisibility rules.

#	Number	divisible by 2	divisible by 3	divisible by 5	divisible by 10
1	10000				
2	47572				
3	395				
4	165				
5	1650				
6	99990				



HOMEWORK/FOLLOW UP

Assign the relevant questions from the textbook on page 39 in exercise 1.

PRIME AND COMPOSITE NUMBERS



STUDENT LEARNING OUTCOMES

- Identify and differentiate 2 – digit prime and composite numbers.

INFORMATION FOR TEACHERS

Teachers should know that:

- If a number is divisible only by itself and 1 then it is called a prime number. For example 2, 3, 5, 7, 11, 13, 17, 19...
- If a number has factors other than 1 and itself i.e. it is divisible by a number other than 1 and itself, then it is called a composite number for example 4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20...
- 1 is the only number that is neither composite nor prime.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Chart paper with numbers from 1 to 100



INTRODUCTION

- Write number 12 on the board.
- Ask students to come up with all the numbers that can divide the number 12.
- Ask students to raise their hands and give answers.
- The teacher should note their answers on the board. 1, 2, 3, 4, 6, 12 are acceptable answers.
- Ask students whether 12 is a composite number or not. Also ask students to explain their answer. Help them understand through this discussion that 12 is a composite number as it has more than 2 factors.
- Ask them to give examples of other composite numbers. Note students' responses on the board. Make corrections if students state prime numbers instead of composite numbers.
- Now write the number 17 on the board.
- Ask students to come up with all the numbers that can divide the number 17.
- Give students a few minutes to discuss amongst themselves and then note their answers on the board.
- Students should only be able to list 1 and 17 as numbers that divide 17.
- The teacher should guide students if they say any other number like 7 or 4 divides 17 by saying out loud the first few multiples of 7 and 4 and showing how 17 is not a multiple of either.
- Tell students that 17 is a prime number.
- Ask students what makes 17 prime? Give students a few minutes to think and then record their answers.

14. Tell students that 17 is a prime number because it has only two factors, 1 and itself, 17.
15. Ask students to work in pairs and to give examples of other prime numbers.
16. Note students' responses on the board. Encourage pairs that don't participate to come up with a prime number.



DEVELOPMENT

Activity 1:

1. Display the chart with numbers from 1 to 100 on the board.
2. Discuss the first row and reasons for writing P and C under the numbers.
3. Ask students to come up to the board one by one and write P under prime numbers and C under composite numbers.
4. The chart should look like the one shown below.

1	2	3	4	5	6	7	8	9	10
	P	P	C	P	C	P	C	C	C
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



CONCLUSION / SUM UP:

1. Summarize the difference between composite and prime numbers by asking students to define both. Ask the students to give 3 examples for each type.

Acceptable answer is:

If a number is divisible only by itself and 1, it is called a prime number for e.g. 5, 7, 11, 13, 17 etc.

If a number is divisible by a number other than 1 and itself, it is called a composite number e.g. 4, 6, 8, 10, 12 etc.



ASSESSMENT

1. Ask the students to list all the numbers in their notebooks that divide 36 and 37.
2. Ask them to compare their answers with the student sitting next to them.
3. Correct answers: 36 is divisible by 1, 2, 3, 4, 6, 12, 18 and 36 as it is composite number. On the other hand 37 is only divisible by 1 and 37 as it is a prime number.



HOMEWORK/FOLLOW UP

Assign questions 1 – 4 on pages 42 – 43 as homework.

FACTORS



STUDENT LEARNING OUTCOMES

- Find factors of a number up to 50

INFORMATION FOR TEACHERS

Teachers should be able:

- To know and understand a factor as a number that divides another number completely without leaving any remainder
- To understand that composite numbers are whole numbers with more than two factors.
- To find factors of different composite numbers.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Flashcards with composite numbers such as 4, 6, 8, 9, 10, 12, 14, 15, 16, 18 (up to 50) and so on written on them.



INTRODUCTION

- Divide the class into groups of 4.
- Tell the entire class that a photographer wants to take a class photo and wants to explore different ways of arranging the class in equal rows.
- Ask each group to explore all the ways in which the photographer can line up 18 students for the photograph.
- Guide the groups with one way the class may be lined up for e.g. the photographer may arrange the class into 3 rows of 6 students each.
- Write on the board $3 \times 6 = 18$ and tell students that the photographer may arrange the 18 students in 3 rows of 6 students each as an option.
- Ask groups for other ways to arrange the class in equal rows.
- Ask the groups to come to the front of the class and present their responses on the board.
- Acceptable answers are ($2 \times 9 = 18$, $3 \times 6 = 18$ as in the given example, $6 \times 3 = 18$, $9 \times 2 = 18$ and $18 \times 1 = 18$)
- Tell the groups that there is also the option of 1×18 where the photographer can line up all 18 students in one row.
- Tell students that numbers that are multiplied together to give 18 are the factors of 18 such as 9 and 2 as $9 \times 2 = 18$.
- Ask a member from all the groups to come to the writing board and list all the factors of 18.
- Guide the groups to the correct factors of 18 which are 1, 2, 3, 6, 9 and 18.



DEVELOPMENT

Activity 1:

1. Ask students to work in the same groups as the introductory activity.
2. Distribute flashcards among groups with some composite numbers such as 4, 6, 8, 12, 14, 15, 16, 18, 20, 21, 22, 24 and so on written on them. Make sure that each group receives a flashcard with at least 4 distinct composite numbers.
3. Tell the students in a group to write, in their notebooks, all the factors of the numbers given to them on their flashcard.
4. Tell students in a group to discuss their answers with other students in their group.
5. The teacher should do a walk through the class and guide the different groups in listing the correct factors.



CONCLUSION / SUM UP:

1. Ask different students to voluntarily to outline what a factor is by giving an example of the factors of a particular number.
2. Ask other students to give feedback to the student.
3. Tell students that numbers that are multiplied together to give a particular number are the factors of that number for example the factors of 20 are 1, 2, 4, 5, 10 and 20 as (1×20) , (2×10) , (4×5) , (5×4) , (10×2) , and (20×1) .



ASSESSMENT

1. Teacher will write the numbers 30 and 45 on the board.
2. The teacher will ask the students to list the factors for 30 and then for 45. Give students a few moments to find the factors.
3. Select random students to present their answers.
4. Guide students to arrive at the correct factors of 30 and 45.



HOMEWORK/FOLLOW UP

Assign question 5 (all parts) on page 43 as homework.

MULTIPLES OF ONE DIGIT NUMBER



STUDENT LEARNING OUTCOMES

- List the first ten multiples of a 1 – digit number.

INFORMATION FOR TEACHERS

Teachers should be able:

1. To understand multiples as the product of one number multiplied by another number.
2. To know the times tables from 1 to 9.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils



INTRODUCTION

1. Ask the students for the numbers that can be divided by 4 with a zero remainder. Write these numbers on the board.
2. Acceptable answers are 4, 8, 12, 16...
3. Tell students that these numbers are called the multiples of 4.
4. Write the following definition of multiple on the board:
Multiple is the product of one number multiplied by another number.
5. Tell students that today we will learn about multiples.



DEVELOPMENT

Activity 1:

1. Tell students that we will be revising our times tables in class today.
2. Ask the first student to pick a number from 2 to 9.
3. Assume the student picks the number 6.
4. Then the 2nd student say 12 i.e. two times 6, the 3rd student will say 18 which is three times 6 and so on until 10 students have had their turn.
5. Tell students that all these numbers which were in the multiplication table of 6, are multiples of 6.
6. Repeat the process for a few other numbers from 1 – 9.
7. Make sure that all students have an opportunity to participate.

Activity 2:

1. Draw the following table on the board and ask the students to copy it in their notebooks.
2. Explain and show the students how to complete the first row.
3. Ask the students to write the first 10 multiples of the number in the right column.
4. Ask the students to compare their answers in pairs.

Number	Multiples
2	2, 4, 6, 8, 10, 12, 14, 16, 18, 20
3	
4	
5	
6	
7	
8	
9	



CONCLUSION / SUM UP:

Summarize that multiples are numbers that are found in the times table of a given number.



ASSESSMENT

Ask students to copy and complete the true/false questions in their notebooks.

- ✧ 24 is a multiple of 8 (True/False)
- ✧ 3 is a multiple of 18 (True/False)
- ✧ 24 is a multiple of 6 (True/False)
- ✧ 7 is a multiple of 7 (True/False)



HOMEWORK/FOLLOW UP

Assign question 6 on page 43 of the book.

DIFFERENCE BETWEEN FACTORS AND MULTIPLES



STUDENT LEARNING OUTCOMES

- Differentiate between factors and multiples.

INFORMATION FOR TEACHERS

Teachers should be able:

1. To understand what multiples and factors are.
2. To know times tables 1 to 9.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Flashcards



INTRODUCTION

1. Write the numbers from 1 to 20 on the board.
2. Circle a number which is not a prime number for e.g., 6
3. Ask the students for numbers that they can multiply to get 6?
4. Write all the correct responses on the board i.e., 1, 2, 3, 6. Explain why these are the correct answers for e.g., $2 \times 3 = 6$
5. Tell students that these numbers are called factors of 6.
6. Now ask the students for numbers that can be divided by 6 leaving zero remainder. Use a different colored chalk / marker to write these correct responses on the board.
7. Acceptable answers are 6, 12, 18, 24... these numbers are the multiples of 6. Explain why these are the correct answers for e.g., $6 \times 2 = 12$.
8. Tell students that today we will learn about the difference between factors and multiples.



DEVELOPMENT

Activity 1:

1. Distribute a flashcard to each pair with a number from 2 – 9 written on it.
2. Tell students that when they are called, they must show their flashcard to the class. One of the two students will then tell all the factors of that number and the other student will tell all the multiples.
3. For e.g., if a pair gets the number 8 then the first student will say “the factors of 8 are 1, 2, 4 and 8”. The second student will say “the multiples of 8 are 8, 16, 24 and 32...”
4. Give most of the students in the class an opportunity to participate.
5. Guide students where necessary.



CONCLUSION / SUM UP:

Remind students about the difference between factors and multiples.



ASSESSMENT

1. Ask a few students to tell the difference between factors and multiples to the class.
2. Ask students to copy and complete the true/false questions in their notebooks.
 - ✧ 27 is a factor of 9 (True/False)
 - ✧ 5 is a multiple of 15 (True/False)
 - ✧ 16 is a multiple of 8 (True/False)
 - ✧ 7 is a factor of 7 (True/False)



HOMEWORK/FOLLOW UP

Assign question 5 – 6 on page 43 of the book.

PRIME FACTORS



STUDENT LEARNING OUTCOMES

- Factorize a number by using prime factors.

INFORMATION FOR TEACHERS

Teacher should know that:

1. A prime number is a number that is divisible by only 1 and itself.
2. The numbers which are divisible by other numbers apart from 1 and itself are called composite numbers for e.g., 6 is a composite number which is divisible by 1, 2, 3 and 6.
3. The number 1 is neither composite nor prime.
4. 2 is the only even prime number.
5. Except for 2, all other even numbers are composite.
6. What a factor is.
7. The factors of a number that are prime numbers are called prime factors.



DURATION / NO OF PERIODS: 2 LESSONS / 35 + 35 MINUTES.



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Flashcards



INTRODUCTION

1. Ask the students: what is a factor?
2. Let the students think and discuss in small groups.
3. Record their responses on the board.
4. Tell students that a number which divides another number is a factor of that number for e.g., 2 is a factor of 4 because 2 divides 4.
5. Ask the students the following questions and let them answer by raising their hands:
What are the factors of 16? Correct answer: (1, 2, 4, 8, 16).
What are the factors of a 9? Correct answer: (1, 3, 9).
6. What are the factors of 7? Correct answer: (1 and 7).
7. Remind students that since 7 only has 2 factors, 1 and 7 (itself) this makes 7 a prime number.
8. Ask students to give examples of other prime numbers (2, 3, 5, 7, 11, 13...) and write them on the board.
9. Tell the students that the factors of a prime number are called prime factors.
10. Ask students and take their responses:
Is 8 a multiple of 4? Yes ($4 \times 2 = 8$ so 2 and 4 are the factors of 8)

Is 4 a factor of 8? Yes (8 is completely divisible by 4)

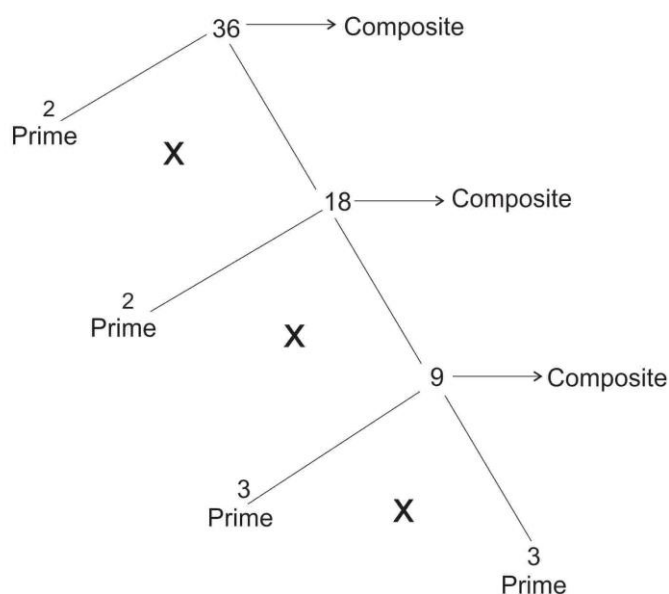
11. Tell students that in today's lesson we will learn how to find the factors of a number.



DEVELOPMENT

Activity 1:

1. Write the number 36 on the board and tell students that we will find all the prime factors of 36.
2. Make the factor tree of 36 as shown below.



3. Explain each step to the students i.e., to continue to factorize composite numbers until prime numbers are left at the end of each branch.
4. Ask the students which numbers are prime? 2, 2, 3, 3
5. Ask students to multiply these prime numbers $2 \times 2 \times 3 \times 3$. What will they get?
6. Show students that the multiplication of the prime factors is equal to 36.
7. Now ask the students to draw factor trees in their notebooks, to find the prime factors of the following numbers:
 - ◇ 12
 - ◇ 28
 - ◇ 30
 - ◇ 64
8. Walk across the class to guide the students.



CONCLUSION / SUM UP

1. Ask students what a factor is and how do we find the prime factors of a number using the factor tree. Students should mention that a number which divides another number is a factor of that number. Students should highlight that when using a factor tree to find prime factors we should continue to factorize composite numbers until prime numbers are left at the end of each branch.
2. Students should complete the questions in Activity 1 as homework.

PRIME FACTORS



INTRODUCTION

1. Ask students to recall how to use the factor tree to find prime factors.
2. Tell students that in today's lesson we will learn to find prime factors using a grid / table.
3. Tell students that we will compare both methods i.e., factor tree method and the table grid method.

Activity 2:

1. Draw the following grid / table on the board in order to find all the prime factors of a number.

	48

2. Tell the students that to find all the prime factors of 48 we first divide it with the smallest prime factor i.e., 2.

2	48
	24

3. Move to the next step below and explain the working.

2	48
2	24
	12

4. Explain each step before completing the entire table like the one below:

2	48
2	24
2	12
2	6
3	3
	1

5. Tell the students that the numbers written on the left side of the table are the prime factors.

6. $2 \times 2 \times 2 \times 2 \times 3 = 48$. Therefore, the prime factors of 48 are 2 and 3.
7. Now ask the students to write the prime factors of the following numbers in their notebooks by using grid/tables:
 - ✧ 12
 - ✧ 28
 - ✧ 30
 - ✧ 64
8. Ask the students to compare their answers to the prime factors from Activity 1.
9. Ask students which method they prefer, the factor tree method or the table / grid method. Record student responses.



CONCLUSION / SUM UP:

1. The teacher should ask students how to find the prime factors of a composite number.
2. After taking a few answers, remind students that in order to find the prime factors of a composite number we can use the factor tree or the grid / table method.



ASSESSMENT

1. Ask students to write the prime factors of the following numbers in their notebooks. Allow them to use any method of their choice.
 - ✧ 16
 - ✧ 18
 - ✧ 19
 - ✧ 38



HOMEWORK/FOLLOW UP

Assign question 1 part b, part e, part h, and part j, on page 46 of textbook.

DETERMINING COMMON FACTORS



STUDENT LEARNING OUTCOMES

- Determine common factors of two or more 2-digit numbers.

INFORMATION FOR TEACHERS

Teachers should be able:

- To understand what factors and prime factors are.
- To find prime factors.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils



INTRODUCTION

- Ask students to recall the steps involved in the prime factorization of a given number.
- After taking their responses, remind students that in order to find the prime factors of a composite number we can use the factor tree or the grid / table method.
- Ask the students to work in pairs and write down the prime factors of 18 in their notebooks.
- Guide students to arrive at the correct answer as shown below.

2	18
3	9
3	3
	1

$$\therefore 2 \times 3 \times 3 = 18$$



DEVELOPMENT

Activity 1:

- Write the following 2 numbers on the board.
36 64
- Ask a student to come to the board and carry out the prime factorization of 36. Ask another student to do the prime factorization of 64.
- Help the students to arrive at the correct answers.
- Now write the prime factors as following and circle the common factors as shown below:

Prime factorization of 36 = $2 \times 2 \times 3 \times 3$

Prime factorization of 64 = $2 \times 2 \times 2 \times 2 \times 2 \times 2$

5. Tell students that when two or more numbers have the same factor, that factor is called a common factor.
6. Ask students what common factors they can identify from the above prime factorization.
7. Tell the students that 2×2 is common in both so we multiply the factors common in both lists to get the common factor.
8. Hence the common factors of 36 and 64 is $2 \times 2 = 4$.

Activity 2:

1. Ask the students to copy and complete the following questions in their notebooks.

Find the common factors of:

- ✧ 8, 12, 16
- ✧ 14, 26, 68

2. Walk around the class and help students where needed.



CONCLUSION / SUM UP:

1. Ask students how do we find the factors of a composite number?
Remind students that factors can be found from the factor tree method or the grid / table method.
2. Ask students how can we find the common factors between 2 or more numbers?
Students should be able to recall that after listing the factors of a number we look for common factors. Lastly we multiply the factors common in both lists to get all the common factors.



ASSESSMENT

1. Ask the students to copy and answer the following question in their notebooks. Help students to arrive at the correct answer as shown below:
2. Find the common factor(s) of:
6, 12, 16, 64

2	6
3	3
	1

$$6 = 2 \times 3$$

2	12
2	6
3	3
	1

$$12 = 2 \times 3 \times 2$$

2	16
2	8
2	4
2	2
	1

$$16 = 2 \times 2 \times 2 \times 2$$

2	64
2	32
2	16
2	8
2	4
2	2
	1

$$64 = 2 \times 2 \times 2 \times 2 \times 2$$

$$6 = 2 \times 3$$

$$12 = 2 \times 3 \times 2$$

$$16 = 2 \times 2 \times 2 \times 2$$

$$64 = 2 \times 2 \times 2 \times 2 \times 2$$

3. As 2 is the only common factor in all 4 numbers, therefore the only common factor of 6, 12, 16 and 64 is 2.



HOMEWORK/FOLLOW UP

Assign parts from Q2 on page 47 of the textbook.

COMMON FACTORS OF TWO DIGIT NUMBER



STUDENT LEARNING OUTCOMES

- Determine common multiples of two or more 2- digit number.

INFORMATION FOR TEACHERS

Teacher should:

- Know the definition of multiples, common multiples i.e., a number that is a multiple of two or more numbers is called the common multiple.
- Be able to find common multiples.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils



INTRODUCTION

- The teacher asks the 1st student to select a number from 2 to 9. Assume the student selects 3, then ask the next student to continue with the 3 times table i.e., the 2nd student will say 6, the 3rd will say 9 and so on.
- Write the responses on the board and remind students that all these numbers are multiples of 3.
- Repeat this for other numbers and ask students to list the multiples.
- Give all students an opportunity to participate.



DEVELOPMENT

Activity 1:

- Draw the following table on the board for the students to copy.
A mother goes to the market to buy groceries. She wants to buy eggs that come in packs of 6. Each pack costs Rs. 70.

Number of packs	Total Number of Eggs	Total Cost
1	6	70
2	12	140
3		
4		
5		
6		

7		
8		
9		
10		

3. Call students one by one on the board and ask them to list all the multiples of 6. (Refer to column of table "Total Number of Eggs") and all the multiples of 70 (Refer to column of table "Total Cost").
4. Explain what the filled table represents. For example, if the mother buys 6 packs of eggs, she will get 36 eggs and it will cost her Rs. 420.
5. Ask a few students to explain what other rows represent.

Activity 2:

1. Write the two numbers on the board:
8 and 12
2. Ask the students to list the first 10 multiples of 8 and 12 in their notebooks.
3. Guide students to arrive at the correct answer.
4. Ask students to find the common multiples of 8 and 12.
5. The multiples that are common in both lists are 24, 48, 72...
6. Tell students that 24, 48, 72 and so on are common multiples of 8 and 12.

Activity 3:

1. Divide the class into groups of 3
2. Ask the groups to copy and complete the following question in their notebooks.
3. Walk around the class and help the groups where needed.
4. Find the first two common multiples of the following numbers:
 - ✧ 9 and 1
 - ✧ 8 and 24
 - ✧ 4, 8 and 12
 - ✧ 10, 20 and 30.



CONCLUSION / SUM UP:

1. Ask students how to find common multiples for 2 or 3 numbers.
2. Write the steps on the board i.e.
 - a. List the first few multiples of the numbers
 - b. Identify the common multiples



ASSESSMENT

1. In your notebooks, find the common multiples of:
 - ✧ 4, 6 and 8
 - ✧ 8 and 12
 - ✧ 5 and 15
2. The teacher should do a walk-through class and guide students.



HOMEWORK/FOLLOW UP

Assign parts from Q3 on page 47 of the textbook.

Month

4

LIKE AND UNLIKE



STUDENT LEARNING OUTCOMES

- Recognize like and unlike fractions.

INFORMATION FOR TEACHERS

1. Teachers should be able to differentiate between like and unlike fractions i.e. fractions with the same denominator are called like fractions and fractions with different denominators are called unlike fractions.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Colour Pencils, Flashcards



INTRODUCTION

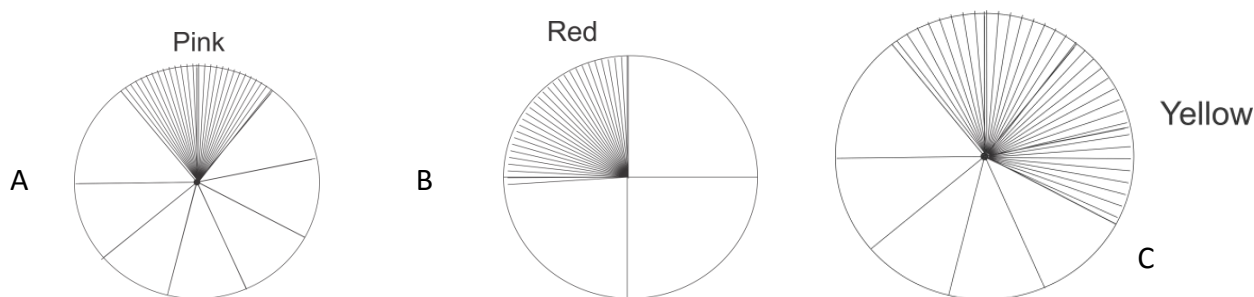
1. Ask a student to bring his / her colour pencils pack/box to the front of the class. Ask the student to take 5 colour pencils such that 2 of these are of the same color.
2. Place these on the table and write the digit 5 on the writing board.
3. Ask the students how many pencils are of the same colour? Correct answer: two out of five.
4. Tell the students that if we want to represent this as a fraction i.e. 2 out of 5 we can write it as $\frac{2}{5}$. Explain that the 2 on the top represents same coloured pencils and the 5 at the bottom represents the total number of colour pencils.
5. Now ask the students what the fraction of different color pencils will be. Guide them to arrive at $\frac{3}{5}$. Tell the students that the number on the top is called a numerator while the number at the bottom is called denominator.
6. Tell students that today we will learn about like and unlike fractions.



DEVELOPMENT

Activity 1:

1. Draw the given figures on the board.



2. Ask the students the following question regarding figure A:
 - ✧ Ali ate the pink part (use coloured chalk or shade the parts) of the cake at his birthday party. What fraction of the cake did Ali eat?
 - ✧ Ask the students how many total pieces of cake can they count? Ask how many pieces did Ali eat?
 - ✧ Ask one of the students to come to the board and write it as a fraction in front of figure A. Answer: $\frac{2}{9}$
3. Divide the class into small groups and tell them to discuss and answer the questions in their notebooks.
4. After student discussion write the correct answers on the board.
5. Ibrahim ate the red part of a pizza at a party. What fraction of the pizza did Ibrahim eat?
Answer: $\frac{1}{4}$
6. Hareem served the yellow part of the cake. What fraction of the cake did Hareem serve to guests? Answer: $\frac{4}{9}$
7. Remind the students that the number on the top is called a numerator while the number at the bottom is called denominator.
8. Ask the students which of the fractions have the same numerators? Answer: none
9. Which of the fractions have the same denominators? Answer: The fractions from Figure A and Figure C.
10. Tell students that the fractions having the same denominators are **like** fractions.
11. The fractions having different denominators are **unlike** fractions.

Activity 2:

1. Make the flashcards showing different fractions e.g.



2. Distribute these flashcards among the students such that each student has one flashcard.
3. Ask the students to write the fractions that their flashcards represent.
4. Ask the students to identify other students in class with like fractions i.e. same denominators.
5. Students that have like fractions must come to the front of the class and tell the class **why** their fractions are **like** fractions.



CONCLUSION / SUM UP:

1. Ask students what are like fractions?
2. Remind students that fractions having the same denominator are called like fractions and the fractions having different denominators are unlike fractions.



ASSESSMENT

Ask the students to copy the following table and match the like fractions.

Column A	Column B
$\frac{1}{4}$	$\frac{2}{3}$
$\frac{3}{8}$	$\frac{3}{4}$
$\frac{2}{7}$	$\frac{5}{8}$
$\frac{1}{3}$	$\frac{1}{7}$



HOMEWORK/FOLLOW UP

Assign Q 1 from the textbook on page 59 in exercise 1.

COMPARISON OF UNLIKE FRACTIONS



STUDENT LEARNING OUTCOMES

- Compare two unlike fractions by converting them to equivalent fractions with the same denominator.

INFORMATION FOR TEACHERS

Teachers should be able:

1. To convert a given fraction into an equivalent fraction.
2. To understand that multiplying both the numerator and denominator of a fraction for e.g. for a fraction $\frac{3}{5}$ if the desired denominator is 10 then $\frac{3}{5} \times \frac{2}{2} = \frac{6}{10}$ yields an equivalent fraction.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Color pencils, Flashcards



INTRODUCTION

1. Write the given fractions on the board $\frac{9}{15}$ and $\frac{1}{15}$ and ask students if the two fractions are like or unlike? Ask if they can tell which one is bigger?
2. Note the responses and reasons. Correct answer is $\frac{9}{15}$ is larger than $\frac{1}{15}$
3. Tell the students, that if the fractions are alike, they can compare the two numerators. In this case, $9 > 1$ so $\frac{9}{15}$ is greater than $\frac{1}{15}$
4. Write these fractions on the board; $\frac{3}{5}$ and $\frac{1}{15}$
5. Ask whether the two fractions are like or unlike fractions? Ask students for the reasons. Correct Answer: They are unlike fractions.
6. Ask students if they know which fraction is the larger fraction? Give students a few minutes to discuss the question in pairs and then tell them that $\frac{3}{5}$ is larger than $\frac{1}{15}$.
7. Inform students that today we will learn how we can compare unlike fractions like $\frac{3}{5}$ and $\frac{1}{15}$ by converting them into equivalent fractions with equal denominators.



DEVELOPMENT

Activity 1:

1. Ask students to work in pairs.
2. Write these two fractions on the board; $\frac{2}{3}$ and $\frac{4}{5}$. Ask students which fraction is larger? Give students a few minutes to think and discuss.
3. Tell students that in order to compare fractions we must first make sure that they have the same denominator.
4. Distribute the following flashcards among students such that each pair has only one card.

$$\frac{2}{3} \times \frac{2}{2} = \boxed{}$$

$$\frac{4}{5} \times \frac{2}{2} = \boxed{}$$

$$\frac{2}{3} \times \frac{3}{3} = \boxed{}$$

$$\frac{4}{5} \times \frac{3}{3} = \boxed{}$$

$$\frac{2}{3} \times \frac{4}{4} = \boxed{}$$

$$\frac{4}{5} \times \frac{4}{4} = \boxed{}$$

$$\frac{2}{3} \times \frac{5}{5} = \boxed{}$$

$$\frac{4}{5} \times \frac{5}{5} = \boxed{}$$

5. Tell the students that, to multiply two fractions, we multiply the numerator with the numerator and the denominator with the denominator. For e.g. $\frac{4}{5} \times \frac{2}{2} = \frac{4 \times 2}{5 \times 2} = \frac{8}{10}$
6. Ask the students to solve the flashcards.
7. Collect the flashcards and paste them on the board as shown below:

$\frac{2}{3}$	$\frac{4}{5}$
$\frac{4}{6}$	$\frac{8}{10}$
$\frac{6}{9}$	$\frac{12}{15}$
$\frac{8}{12}$	$\frac{16}{20}$
$\frac{10}{15}$	$\frac{20}{25}$

8. Explain to the students that whenever we multiply a fraction with another fraction, such that it has the same numerator and denominator, we get an equivalent fraction. Hence all fractions on the left are equal to each other while all fractions on the right are equal to each other.
9. Now remind students that in order to compare two fractions we need like fractions. Ask students to identify like fractions which we can compare to see whether $\frac{2}{3}$ is bigger or $\frac{4}{5}$?
10. Give pairs a few minutes to observe the board and come up with their answers.
11. Guide students to the correct answer i.e. $\frac{10}{15}$ and $\frac{12}{15}$ are like fractions and can be compared.

12. Now once again ask students which fraction is larger? $\frac{10}{15} < \frac{12}{15}$
13. If students are not aware that "<" means "less than", then the teacher should explain the meaning of the symbol.
14. Guide student during their discussion. If $\frac{4}{5} = \frac{12}{15}$, and $\frac{2}{3} = \frac{10}{15}$, then we can say that $\frac{2}{3} < \frac{4}{5}$

Activity 2:

1. Write the word problem from real life situation on the board.
Ibrahim cuts a cake in 8 equal parts and ate 3 pieces of it while Hareem cuts a similar cake in 5 equal pieces and ate 2 of the pieces. Who ate more cake? (or in other words which fraction is larger $\frac{3}{8}$ or $\frac{2}{5}$?)
2. Ask students to work in pairs
3. Ask students to write the two fractions under consideration in their notebooks i.e. $\frac{3}{8}$ and $\frac{2}{5}$
4. Ask the students to compare the fractions by converting them to equivalent fractions by following the same steps as in the earlier activity.
5. Guide pairs during the activity by conducting a walk through the class.



CONCLUSION / SUM UP:

1. Conclude your activity as, when we compare two unlike fraction, first we convert it to equivalent fraction with the same denominator.



ASSESSMENT

1. Ask the students to copy and complete the following questions:
Is the following statement true? State with reasoning.

$$\frac{2}{5} < \frac{3}{7}$$

2. Fill in the blanks with "< or >"

$$\frac{1}{3} \square \frac{2}{5}$$



HOMEWORK/FOLLOW UP

Assign the Question 2 from the textbook on page 60 in exercise 1.

SIMPLIFICATION OF FRACTIONS



STUDENT LEARNING OUTCOMES

- Simplify fractions to the lowest form.

INFORMATION FOR TEACHERS

Teachers should know how to convert a given fraction into its lowest form by identifying the common factor and then dividing both numerator and denominator by the common factor for e.g., $\frac{4}{6}$ has a common factor of 2 so in order to simplify the fraction, we do $\frac{4}{6} \div \frac{2}{2} = \frac{2}{3}$ bringing it to its lowest form.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Flashcards (2 sets)



INTRODUCTION

- Write the fraction on the board: $\frac{2}{6}$.
- Ask students how can the above fraction be expressed in its lowest terms?
- Give students a few minutes to discuss in pairs and record their responses.
- Guide students to arrive at identifying 2 as a common factor for both 2 and 6. Then reduce $\frac{2}{6}$ to its lowest form by dividing the numerator and denominator by the common factor i. e. $\frac{2}{6} \div \frac{2}{2} = \frac{1}{3}$.
- Now write the given fractions on the board $\frac{3}{9}, \frac{2}{4}, \frac{1}{3}$.
- Ask the pairs of students to identify the common factor for all 3 fractions. After recording their responses share the correct answers:

3 is a common factor for $\frac{3}{9}$

2 is a common factor for $\frac{2}{4}$

The fraction $\frac{1}{3}$ is already in its simplest form



DEVELOPMENT

Activity 1:

Before beginning the activity the teacher must prepare two different and equal sets of flashcards. The first set will have various fractions and the second set will have the same fractions reduced to their lowest forms.

1. Ask the students to come turn by turn to pick a card from the first pack and then find its lowest form from the second pack.
2. Paste the correct matching pair on the board.
3. Ensure participation of all students in this activity.

Activity 2:

1. Ask the students to copy and complete the following in their notebooks.

Reduce the following fractions to their lowest form:

$$\diamond \frac{2}{10}$$

$$\diamond \frac{3}{12}$$

$$\diamond \frac{5}{20}$$

$$\diamond \frac{6}{24}$$

$$\diamond \frac{7}{35}$$

2. When most of the students have completed the first part, ask a student to come to the board and solve it.
3. Help students to reach the correct answer.
4. Move to the next part and so on.



CONCLUSION / SUM UP:

1. Guide students during their discussion so that they may recall that in order to reduce a fraction to its simplest form, we have to find the common factor in both the numerator and denominator and then divide both by the common factor for e.g. $\frac{6}{9}$ has a common factor of 3. In order to reduce $\frac{6}{9}$ to its lowest form, we divide the numerator and denominator by 3 as shown $\frac{6}{9} \div \frac{3}{3} = \frac{2}{3}$



ASSESSMENT

1. Ask the students to reduce the given fractions to their lowest form in their notebooks.
 $\frac{6}{18}, \frac{7}{14}$
2. Walk through the class and guide students in finding the common factors.



HOMEWORK/FOLLOW UP

Assign Question 3 from the textbook on page 60 in exercise 1.

IDENTIFICATION OF FRACTIONS



STUDENT LEARNING OUTCOMES

- Identify (unit, proper, improper) fractions and mixed numbers.

INFORMATION FOR TEACHERS

Teachers should be able:

- To differentiate between unit fractions ($\frac{1}{3}$), proper fractions ($\frac{2}{3}$) and improper fractions ($\frac{7}{2}$).
- To know that mixed numbers comprise of a whole number and a proper fraction for e.g. $2\frac{1}{4}$ is a mixed number where 2 is the whole number and $\frac{1}{4}$ is the proper fraction.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Flashcards with different fractions written on them



INTRODUCTION

- Draw the following figure on the board.



- Ask students how can we represent the figure above as a fraction? Record student responses.
- Guide students to arrive at $\frac{3}{5}$.
- Ask students if they know what type of fraction $\frac{3}{5}$ is. Record student responses.
- Tell students that if a fraction has numerator that is **smaller than** the denominator, it is called a proper fraction such as $\frac{3}{5}$.
- Now draw the following figure on the board.



- Ask students how can we represent the figure above as a fraction?
- Guide students to write $\frac{5}{5} + \frac{3}{5} = \frac{8}{5}$
- Ask students if they know what type of fraction $\frac{8}{5}$ is. Record student responses.

10. Tell students that if a fraction has numerator that is **larger than (or the same as)** the denominator, it is called an improper fraction.
11. Re-write $\frac{5}{5} + \frac{3}{5} = \frac{8}{5}$ on the board and tell students that $\frac{5}{5}$ is the same as one whole.
12. The teacher should give the following example to explain this. If Ali eats 5 slices of a cake which had 5 pieces. How much cake did Ali eat? Can we say that Ali ate **1 whole** cake?
13. Therefore, $\frac{5}{5} + \frac{3}{5}$ can also be written as $1 + \frac{3}{5}$ or $1\frac{3}{5}$
14. Ask students if they know what type of fraction $1\frac{3}{5}$ is. Record student responses.
15. Tell students that an improper fraction can also be written as a mixed number which has a whole number part (1) and a proper fraction part ($\frac{3}{5}$)
16. Lastly, tell students that any fraction that has a numerator of 1 is called a unit fraction for e.g. $\frac{1}{4}$ is a unit fraction.



DEVELOPMENT

Activity 1:

1. Place the given flashcards with fractions on the table. Each flashcard should have a different fraction.
 $\frac{1}{3}, \frac{7}{4}, 1\frac{2}{3}, \frac{4}{7}, 1\frac{1}{2}, \frac{6}{6}, \frac{8}{2}, \frac{8}{8}, 4\frac{2}{5}, \frac{5}{2}, \frac{2}{4}$
2. Draw the table below on the board and pick a few students to paste each flashcard in the correct column.

Unit Fraction	Proper Fraction	Improper Fraction	Mixed Number

3. Help students paste the flashcard in the correct column.

Activity 2:

1. Make four groups of students.
2. Each group will write four examples of each of the following on flashcards:
 - ✧ unit fractions
 - ✧ proper fractions
 - ✧ improper fractions
 - ✧ mixed fractions
3. Students should come in groups and paste their cards in the suitable columns on the writing board.

Unit Fraction	Proper Fraction	Improper Fraction	Mixed Number

4. Ask rest of the students to correct any mistakes that the first group might have made.
5. Follow the same exercise with the remaining groups.



CONCLUSION / SUM UP:

1. Help students to recall the difference between unit fractions ($\frac{1}{3}$), proper fractions ($\frac{2}{3}$) and improper fractions ($\frac{7}{2}$).
2. Remind the students that the fraction which has a whole number part and a proper fraction part is called a mixed number or a compound fraction.



ASSESSMENT

1. Ask students what is the difference between unit fractions ($\frac{1}{3}$), proper fractions ($\frac{2}{3}$), improper fractions ($\frac{7}{2}$) and mixed numbers ($1\frac{3}{4}$)
2. Ask students to give examples for each type.



HOMEWORK/FOLLOW UP

Assign Question 4 from the textbook on page 60 in exercise 1.

CONVERSION OF FRACTIONS



STUDENT LEARNING OUTCOMES

- Convert improper fractions to mixed numbers and vice versa.

INFORMATION FOR TEACHERS

Teachers should know:

- Mixed numbers comprise of a whole number and a proper fraction for e.g., $2\frac{1}{4}$ is a mixed number where 2 is the whole number and $\frac{1}{4}$ is the proper fraction.
- How to convert improper fractions to mixed numbers and vice versa.



DURATION / NO OF PERIODS: 2 LESSONS / 35 + 35 MINUTES



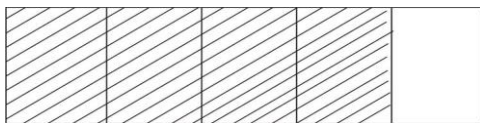
MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Flashcards with Improper fractions and mixed numbers

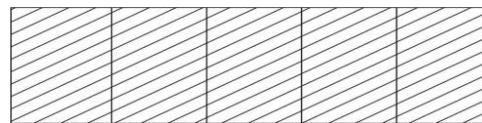


INTRODUCTION

- Draw the following figure on the board.



$$\frac{5}{5}$$



$$\frac{4}{5}$$

- Ask students how can we add the figure above as a fraction? Give students a few minutes to discuss in pairs and then record their answers.
- Guide students to arrive at $\frac{5}{5} + \frac{4}{5} = \frac{9}{5}$
- Ask students, what is another way of writing $\frac{5}{5} + \frac{4}{5}$.
- Give students a few minutes to discuss in pairs and then record their answers.
- Guide students to reach at the correct answer i.e. $1 + \frac{4}{5} = 1\frac{4}{5}$

Explain that $\frac{5}{5}$ is 1 whole as if a student has 5 pieces of cakes (denominator) and eats 5 pieces (numerator) he has eaten the whole cake.

- Ask students, does this imply that $\frac{9}{5}$ and $1\frac{4}{5}$ are equal?
- After student discussion and responses tell students, yes $\frac{9}{5}$ and $1\frac{4}{5}$ are different ways of writing the same fraction.

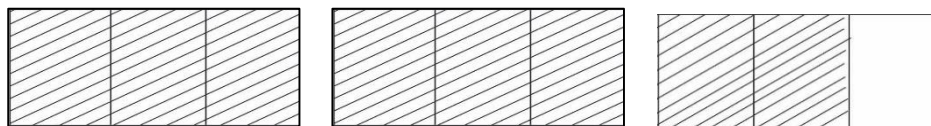
- Tell students today we will learn to convert improper fractions to mixed numbers and vice versa.



DEVELOPMENT

Activity 1:

- Ask students to represent the following figure as a fraction in their notebooks.



- Students may write $\frac{8}{3}$
- In order to convert $\frac{8}{3}$ into a mixed number, we will use long division. Do the following on the board and label Quotient, Remainder and Divisor for students.

$$\begin{array}{r} 2 \\ 3 \overline{) 8} \\ - 6 \\ \hline 2 \end{array}$$

- Explain that in order to write $\frac{8}{3}$ as a mixed number we simply write *Quotient* $\frac{\text{Remainder}}{\text{Divisor}}$ which in this case is $\frac{8}{3} = 2\frac{2}{3}$
- Now write the following on the board and tell students that if we want to convert the mixed number back into an improper fraction we will do the following i.e.

$$2 \begin{array}{l} + \nearrow 2 \\ \times \searrow 3 \end{array} \frac{2}{3}$$

Multiply the denominator with the whole number and add the numerator to get $3 \times 2 = 6 + 2 = 8$ as the new numerator and keep the denominator as the same. Therefore, the mixed number $2\frac{2}{3}$ can be written as an improper fraction, $\frac{8}{3}$.

- Ask students to note the example above in their notebooks.



CONCLUSION

- Ask students how do we convert improper fractions to mixed numbers and how do we convert mixed numbers to improper fractions.
- Ask students to come up to the board and give examples for each.
- Ask other students to give their input as well.
- Guide students to follow the correct steps in the conversions.

CONVERSION OF FRACTIONS



INTRODUCTION

1. Tell students to recall the steps in the conversion of improper fractions to mixed numbers and vice versa.
2. Tell students that in today's lesson we will practice some questions to develop fluency in the concept.

Activity 2:

1. Make flashcards with different improper fractions and mixed numbers.
2. Distribute the flashcards among the students.
3. Tell students to work in pairs.
4. The following could be some of the numbers on the flashcards.

$$\frac{9}{5}, \frac{12}{5}, \frac{13}{10}, \frac{21}{9}, \frac{17}{2}, 3\frac{2}{5}, 6\frac{5}{7}, 4\frac{2}{7}, 3\frac{3}{5}, 2\frac{3}{13}, 5\frac{4}{11}$$
5. Ask the pairs to write the alternative representation (i.e. if the number is a mixed number write the improper fraction and if there is an improper fraction write the mixed number representation) on the reverse side of their flashcards.
6. Ask the pairs to come forward with their flashcards and show the alternate representation on the back of their flashcard.
7. Allow other students to help the students in a pair to get the right answer.



CONCLUSION / SUM UP:

Ask students to recall the steps in converting improper fractions into mixed number and mixed number into improper fraction by listing examples of both.



ASSESSMENT

1. Write the following questions on the board and ask the students to solve it in their notebooks.
 - ✧ Convert $\frac{15}{3}$ into mixed number
 - ✧ Convert $3\frac{4}{6}$ into improper fraction
2. Monitor their work during this activity and give feedback where necessary.



HOMEWORK/FOLLOW UP

Assign question 5 and 6 from the textbook on page 60 in exercise 1.

ARRANGEMENT OF FRACTIONS



STUDENT LEARNING OUTCOMES

- Arrange fractions in ascending and descending order.

INFORMATION FOR TEACHERS

Teachers should be able:

1. To convert fractions to equivalent fractions.
2. To understand that proper fractions are < 1 .
3. To understand that improper fractions are $>$ or equal to 1.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Flashcards



INTRODUCTION

1. Write the following fractions on the board:

$$\frac{1}{2}, \frac{1}{3}, \frac{1}{6}$$

2. Ask students to work in pairs and carefully observe these fractions and try to sort out the fractions in ascending order/smallest to the largest.
3. Ask students what do they need to do before they can compare the fractions? Give the pairs a few moments to reflect and record their answers.
4. Tell students that to compare the 3 fractions we must ensure that the denominators are the same.
5. Ask students how we can make the denominators the same. Give the pairs a few moments to reflect and record their answers. Encourage students to multiply the fractions with $\frac{2}{3}, \frac{3}{3}$ even $\frac{4}{4}$.
6. Draw students' attention to all 3 fractions having the same denominator, i.e., 6.
7. Show students that in order to make the denominators the same i.e., 6, we do the following

$$\frac{1}{2} \times \frac{3}{3} = \frac{3}{6}$$

$$\frac{1}{3} \times \frac{2}{2} = \frac{2}{6}$$

8. Now we can arrange the fractions from smallest to largest.

$$\frac{1}{6}, \frac{2}{6}, \frac{3}{6} \text{ or } \frac{1}{6}, \frac{1}{3}, \frac{1}{2}$$

9. Tell students that to compare fractions, we convert them into equivalent fractions and then compare their numerators.



DEVELOPMENT

Activity 1:

1. Write the given fractions on board.

$$\frac{2}{7}, \frac{1}{2}, \frac{3}{5}$$

2. Ask the students to write the fractions in ascending order in their notebooks. Hint: Convert all fractions to equivalent fractions, i.e., their denominators should be 14.

$$\frac{2}{7} = \frac{2}{7} \times \frac{2}{2} = \frac{4}{14}$$

$$\frac{1}{2} = \frac{1}{2} \times \frac{7}{7} = \frac{7}{14}$$

Therefore $\frac{1}{2} > \frac{2}{7}$ tell the students to observe that $\frac{1}{2} > \frac{2}{7}$ and $\frac{1}{2} < \frac{3}{5}$

3. Now write $\frac{3}{5}$ on the board and ask students to compare $\frac{1}{2}$ and $\frac{3}{5}$

$$\frac{1}{2} = \frac{1}{2} \times \frac{5}{5} = \frac{5}{10}$$

$$\frac{3}{5} \times \frac{2}{2} = \frac{6}{10}$$

Therefore $\frac{1}{2} < \frac{3}{5}$

4. If we write the fractions in ascending order, we get $\frac{2}{7} < \frac{1}{2} < \frac{3}{5}$ and in descending order, we get $\frac{3}{5} > \frac{1}{2} > \frac{2}{7}$

Activity 2:

1. Ask the students to work in pairs, trios, or groups of 4

2. Make flashcards and write different fractions on them:

$$\frac{3}{5}, \frac{1}{5}, \frac{7}{10}, \frac{17}{20}, \frac{2}{5}, \frac{4}{10}, \frac{3}{30}, \frac{19}{20}$$

3. The teacher should make multiple copies of flashcards to ensure that each pair gets several flashcards.

4. Ask the students to place their flashcards in ascending order and then in descending order.

5. Make sure that all students are involved in the activity.

6. Guide students by walking through class and observing sorting by each pair.



CONCLUSION / SUM UP:

Remind students:

1. That in order to compare fractions, we must first find equivalent fractions and then compare the numerators.
2. After comparing the numerators, we can write them either in ascending or descending order.



ASSESSMENT

1. Re-write the fractions given below in ascending and descending order:

$$\frac{5}{6}, \frac{2}{3}, \frac{11}{12}$$

Ascending Order	Descending order



HOMEWORK/FOLLOW UP

Assign Question 7 from the textbook on page 60 in exercise 1.

ADDITION OF FRACTIONS



STUDENT LEARNING OUTCOMES

- Add fractions with like denominators.

INFORMATION FOR TEACHERS

Teachers should be able to add fractions with the same denominators i.e., add the numerators and keep the denominators the same.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils



INTRODUCTION

1. Tell students that a pizza is cut into 8 equal slices. Wali has 2 slices and Rustam has 3 slices. What fraction of the pizza did Wali and Rustam have together?
2. Tell students to work in pairs and to share their answers. Record their answers on the board.
3. In order to explain the solution to students draw a diagram clearly showing:
 Fraction eaten by Wali = $\frac{2}{8}$
 Fraction eaten by Rustam = $\frac{3}{8}$
 Fraction eaten by both = $\frac{2}{8} + \frac{3}{8} = \frac{5}{8}$
4. Ask students how we added the fractions? What happened to the numerator? What happened to the denominator? Let students discuss in their pairs and share their answers.
5. Tell students that to add fractions with like denominators, only the numerators are added while the denominator stays the same.



DEVELOPMENT

Activity 1:

1. Write the following questions on the board and ask students to copy and complete the following questions in their notebooks.
 - ✧ $\frac{3}{7} + \frac{2}{7}$
 - ✧ $\frac{11}{13} + \frac{1}{13}$
 - ✧ $\frac{7}{15} + \frac{7}{15}$
 - ✧ $\frac{4}{8} + \frac{2}{8}$

✧ $\frac{6}{7} + \frac{4}{7}$ (Give answer in mixed numbers)

✧ $\frac{7}{15} + \frac{8}{15}$

2. After students have completed their work, ask a few students to come to the board one by one and solve each part.
3. Help students to answer the questions.



CONCLUSION / SUM UP:

Remind students that to add fractions with like denominators, only the numerators are added and the denominators stay the same.



ASSESSMENT

Copy and match Column A with the correct answer in Column B:

COLUMN A	COLUMN B
$\frac{5}{8} + \frac{2}{8}$	$\frac{20}{21}$
$\frac{9}{13} + \frac{3}{13}$	$\frac{12}{13}$
$\frac{14}{21} + \frac{6}{21}$	$\frac{7}{8}$



HOMEWORK/FOLLOW UP

Assign Question 1 from the textbook on page 63 in exercise 2

SUBTRACTION OF FRACTIONS



STUDENT LEARNING OUTCOMES

- Subtract fractions with like denominators.

INFORMATION FOR TEACHERS

1. Teachers should understand and should be able to do subtraction of common fractions with like denominators.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils



INTRODUCTION

1. Tell the students that a pizza was cut into four equal parts. Draw the pieces on the board.
2. Ali took 1 part of it ($\frac{1}{4}$) while Usman took three parts ($\frac{3}{4}$) of it.

Ali's



Usman's



3. How much more pizza did Usman take than Ali?
4. In order to answer this question students should be asked to guess the answer by looking at the board. Teachers should ask them to count the pieces left for Usman after one fourth is taken away. Since each piece is one fourth, students should be able to say that the answer is two fourths by looking at the picture.
5. Students should now be asked to carefully observe

$$\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$$
6. The teacher should highlight that the same answer that they obtained by looking at the drawing can also be obtained by simply subtracting the smaller numerator (1) from the larger numerator (3).

7. Students should be asked again: How much more Pizza did Usman take? Students should say that Usman took $\frac{2}{4}$ of the pizza more than Ali.
8. Tell students to pay special attention to the following:
In the subtraction of fractions with like denominators only the numerators are subtracted (smaller from larger) while the denominator remains the same as shown in the example above.



DEVELOPMENT

Activity 1:

1. Ask the students to copy and complete the following questions in their notebooks:

$$\begin{array}{l} \diamond \quad \frac{3}{7} - \frac{2}{7} \\ \diamond \quad \frac{9}{13} - \frac{7}{13} \\ \diamond \quad \frac{7}{15} - \frac{2}{15} \\ \diamond \quad \frac{4}{8} - \frac{2}{8} \\ \diamond \quad \frac{6}{7} - \frac{1}{7} \\ \diamond \quad \frac{7}{15} - \frac{7}{15} \end{array}$$

2. After completing their work, ask a few students to come on the board one by one and solve each part.
3. Guide students to correctly solve the questions.



CONCLUSION / SUM UP:

1. Ask students to summarize the key takeaways in the subtraction of fractions. Remind students that in the subtraction of fractions with like denominators, only the numerators are subtracted and the denominators remain the same.
2. Emphasize that it is important to subtract the smaller numerator from the bigger one.



ASSESSMENT

Ask the students to copy the following table in their notebooks and match Column A with the correct answer in Column B

COLUMN A	COLUMN B
$\frac{7}{3} - \frac{5}{3}$	$\frac{7}{3}$
$\frac{5}{3} - \frac{4}{3}$	$\frac{1}{3}$
$\frac{8}{3} - \frac{1}{3}$	$\frac{2}{3}$



HOMEWORK/FOLLOW UP

Assign Question 2 from the textbook on page 63 in exercise 2.

MULTIPLICATION OF FRACTIONS



STUDENT LEARNING OUTCOMES

- Multiply a fraction (proper, improper) and mixed number by a whole number.

INFORMATION FOR TEACHERS

Teachers should be able to multiply fractions (proper and improper) with a whole number.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils



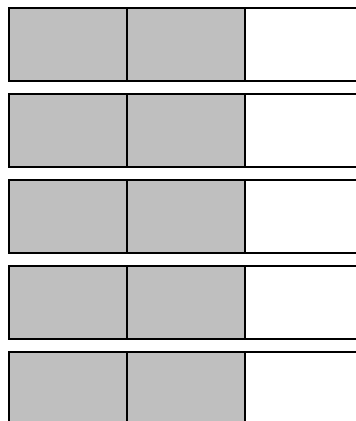
INTRODUCTION

1. Ask students to work in pairs and multiply the following:

$$\frac{2}{3} \times 5$$

2. The teacher may also hint that multiplication is repeated addition. Give students a few minutes to think and discuss in pairs. Record student responses on the board.
3. Draw the following figure to help students see multiplication as repeated addition. The figure below shows:

$$\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} \text{ or } \frac{2}{3} \times 5$$



4. Tell the students that the shaded portion of all the figures is 5 times $\frac{2}{3}$
i.e. $5 \times \frac{2}{3}$
5. Give students a few minutes to arrive at the correct answer. $\frac{2}{3} \times 5 = \frac{10}{3}$

6. Remind them the rule of addition for fractions is that if the denominator is the same, you add the numerator only and write the denominator as it is.
7. Tell students that when a fraction is multiplied by a whole number, only the numerator gets multiplied by the whole number while the denominator remains the same. In this case $5 \times 2 = 10$ and the numerator was 3 so $\frac{10}{3}$ is the answer.



DEVELOPMENT

Activity 1

1. Ask the students to work in pairs. Copy and complete the following questions in their notebooks.
 - ✧ $\frac{3}{7} \times 4$
 - ✧ $\frac{7}{13} \times 7$
 - ✧ $\frac{7}{5} \times 2$
 - ✧ $\frac{4}{8} \times 3$
 - ✧ $\frac{17}{4} \times 2$
2. Ask pairs to share their answers.
3. Walk through the class and guide students.



CONCLUSION / SUM UP:

Tell the students that to multiply a fraction with a whole number, only the numerator is multiplied with the whole number while the denominator remains the same.



ASSESSMENT

Copy and match Column A with the correct answer in Column B

COLUMN A	COLUMN B
$\frac{1}{4} \times 7$	$\frac{60}{5}$
$\frac{12}{5} \times 5$	$\frac{33}{9}$
$\frac{11}{9} \times 3$	$\frac{7}{4}$



HOMEWORK/FOLLOW UP

Assign Question 1 from the textbook on page 67 in exercise 3.

MULTIPLICATION OF PROPER AND IMPROPER FRACTIONS



STUDENT LEARNING OUTCOMES

- Multiply two fractions (proper, improper) and mixed numbers.

INFORMATION FOR TEACHERS

Teachers should be able:

1. To multiply fractions (proper and improper) with other fractions.
2. To understand that to multiply fractions with mixed numbers, they must first convert the mixed number into an improper fraction.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils



INTRODUCTION

1. Ask students to work in pairs and multiply the following:

$$\frac{2}{3} \times \frac{5}{7}$$

2. Give students a few minutes for discussion in their pairs. Record all responses.
3. Tell students that $\frac{2}{3} \times \frac{5}{7} = \frac{10}{21}$
4. Ask students to share their observations about the multiplication. What do they notice? Give the pairs a few minutes to discuss and share their observations.
5. Praise the students that observe that when a fraction is multiplied by another fraction, the numerator gets multiplied with the numerator and the denominator gets multiplied with the denominator.



DEVELOPMENT

Activity 1

1. Ask the students work in pairs and to copy and complete the following questions in their notebooks.
2. Tell the students to convert mixed numbers to improper fractions before multiplying. Remind students how to convert mixed numbers to improper fractions.

$$\diamond \frac{3}{7} \times \frac{4}{3}$$

$$\diamond \frac{7}{13} \times \frac{7}{2}$$

$$\begin{aligned} &\diamond \frac{7}{5} \times 2\frac{4}{7} \\ &\diamond \frac{4}{8} \times 3\frac{1}{3} \\ &\diamond \frac{17}{4} \times \frac{1}{2} \end{aligned}$$

3. Ask a few students to come to the board, one by one, and answer each question.



CONCLUSION / SUM UP:

1. Ask students what are the key takeaways in the multiplication of fractions. Students should recall that in the multiplication of fractions with other fractions, the numerators are multiplied with the numerators and the denominators are multiplied with denominators.
2. Furthermore, students should also highlight that in order to multiply fractions with mixed numbers they must first convert the mixed number into an improper fraction and then proceed with multiplication.



ASSESSMENT

Ask the students to copy the following table in their notebooks and match Column A with the correct answer in Column B

COLUMN A	COLUMN B
$\frac{1}{4} \times 1\frac{5}{7}$	$\frac{36}{35}$
$\frac{12}{5} \times \frac{3}{7}$	$\frac{12}{28}$
$\frac{11}{9} \times \frac{1}{9}$	$\frac{11}{81}$



HOMEWORK/FOLLOW UP

Assign Question 2 from the textbook on page 67 in exercise 3.

DIVISION OF FRACTIONS



STUDENT LEARNING OUTCOMES

- Divide a fraction (proper, improper) and mixed numbers by a whole number.

INFORMATION FOR TEACHERS

Teachers should be able:

1. Be able to divide fractions (proper and improper) by a whole number.
2. Understand that to divide fractions (proper and improper) by a mixed number, the mixed number should first be converted to an improper fraction.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils



INTRODUCTION

1. The teacher should write the following real life scenario on the board.
2. Sara cut a cake in to four equal pieces. She gave $\frac{1}{4}$ part of the cake to her friend.
3. She wants to evenly distribute the remaining $\frac{3}{4}$ among her 5 siblings.
4. Ask the students, "How can Sara find out how much cake each of her 5 siblings will get?"
5. Ask the students if the following set-up is correct: $\frac{3}{4} \div 5$
6. Give students a few minutes to think and then record their responses.
7. Tell students that in order to solve this question students have to identify the invisible denominator of the whole number 5. Ask students if they can guess this denominator?
8. After a brief discussion tell students that every whole number has a "hidden denominator" of 1. This is because, say you have 5 sweets and you want to distribute those 5 sweets among 1 person, that 1 person will get all 5. Therefore, 5 is actually $\frac{5}{1}$.
9. The hidden denominator is 1. Therefore the question becomes $\frac{3}{4} \div \frac{5}{1}$
10. Tell students that in order to solve $\frac{3}{4} \div \frac{5}{1}$ we can simply re-write the question as follows i.e. the division sign can be changed to multiplication and we invert the 2nd fraction from $\frac{5}{1}$ to $\frac{1}{5}$
11. Therefore, the question becomes $\frac{3}{4} \times \frac{1}{5}$
12. Ask students what the final answer is.
13. Students may then recall and solve the multiplication as per normal to get the answer $\frac{3}{20}$.



DEVELOPMENT

Activity 1:

1. Ask the students to work in pairs and copy and complete the following questions in their notebooks. Tell students to make sure they convert mixed numbers to improper fractions before dividing.
 - ✧ $\frac{4}{3} \div 7$
 - ✧ $\frac{7}{15} \div 2$
 - ✧ $2\frac{2}{3} \div 5$
 - ✧ $4\frac{2}{3} \div 3$
 - ✧ $\frac{1}{2} \div 11$
2. After students have completed their work, ask a few students to come to the board one by one and solve each part.
3. Help students to correctly answer the questions.



CONCLUSION / SUM UP:

1. Ask the students to share the important rules they have learnt for division of fractions.
2. Help them recall that:
 - ✧ In the division of fractions with a whole number, the first step is to write the hidden denominator of the whole number i.e. 1.
 - ✧ To divide fractions with a whole number, they must change the division sign to multiplication and invert/flip the 2nd fraction.
 - ✧ In the multiplication of fractions with other fractions, the numerators are multiplied with the numerators and the denominators are multiplied with denominators.
 - ✧ To multiply mixed numbers with whole numbers, the students must first convert the mixed number into an improper fraction.



ASSESSMENT

Ask the students to copy the following table in their notebooks and match Column A with the correct answer in Column B:

Column A	Column B
$\frac{6}{5} \div 3$	$\frac{5}{16}$
$\frac{1}{2} \div 3$	$\frac{1}{6}$
$\frac{5}{4} \div 4$	$\frac{6}{15}$



HOMEWORK/FOLLOW UP

Assign Question 3 from the textbook on page 67 in exercise 3.

ANALYSIS OF REAL LIFE SITUATIONS – FRACTIONS



STUDENT LEARNING OUTCOMES

- Analyze real life situations involving fractions by identifying appropriate number operations.

INFORMATION FOR TEACHERS

Teachers should understand how to unpack real-life situations involving fractions and use the appropriate operations.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Flashcards



INTRODUCTION

- Write the following question on the board:

There is a large soft drink bottle in Aisha's home. Aisha drinks $\frac{1}{5}$ of the bottle with lunch and $\frac{3}{5}$ of the bottle with dinner. What fraction of the bottle did Aisha have altogether?

- Explain the question to the students and ask what operation will be used to solve this question?
- Guide students to arrive at the answer i.e. addition.
- Ask a student to come up to the board and write the fractions and the operation.

The question to be solved is:

$$\frac{1}{5} + \frac{3}{5}$$

- Ask students to recall the addition of like fractions to get the answer:

$$\frac{1}{5} + \frac{3}{5} = \frac{4}{5}$$



DEVELOPMENT

Activity 1:

- Divide the class into groups of 4.
- Give each group a different flashcard with one of the questions below written on the card.

- ✧ Tell the group to answer their question and then share the solution with the entire class. Ali drinks $45\frac{1}{4}$ liters of water in 20 days. On average, how much water does he drink daily?
 - ✧ Amna's weight is $\frac{2}{3}$ of her older brothers. If her brother weighs 86 kg. How much does Amna weight?
 - ✧ Hasna had $\frac{1}{8}$ pieces of a birthday cake, whereas Hajra had $\frac{2}{8}$ pieces. As a fraction, how much more cake did Hajra have than Hasna?
 - ✧ Hamid walks from home to school a distance of $\frac{5}{4}$ km and then from school to Ahmed's house a distance of $\frac{3}{4}$ km. How much distance does Hamid cover in total?
3. After giving sufficient time to groups for solving their question, ask a student from each group to come to the board and explain their solution.
 4. Guide the student to answer the question. Allow other students to give their input.



CONCLUSION / SUM UP:

Conclude that in real life we come across many problems which involve the use of fractions. It is important to read the questions carefully to find which operation is to be used.



ASSESSMENT

Ask the students to solve the following real life situations in their notebooks:

1. Ali's age is $\frac{1}{3}$ of his older sister Robina's. Robina age is 45 years. How old is Ali?
Hint: Solve $\frac{1}{3} \times 45$
2. Jamal will distribute $5\frac{1}{8}$ packets of sweets equally among 5 children. As a fraction, how much packs of sweets will each child get?
Hint: Solve $5\frac{1}{8} \div 5$



HOMEWORK/FOLLOW UP

Assign Question 4, 5, 6 and 7 from the textbook on page 67 in exercise 3.

Month

5

DECIMAL NUMBERS



STUDENT LEARNING OUTCOMES

1. Recognize a decimal number as an alternative way of writing a fraction.
2. Express a decimal number as a fraction whose denominator is 10, 100 or 1000.

INFORMATION FOR TEACHERS

Teachers should be able:

1. To understand that fractions can be represented as decimals.
2. To know that a decimal is a fraction with a denominator of 10, 100 or 1000.
3. To write decimal numbers as fractions with denominators of 10, 100 or 1000.



DURATION / NO OF PERIODS: 2 LESSONS / 35 + 35 MINUTES



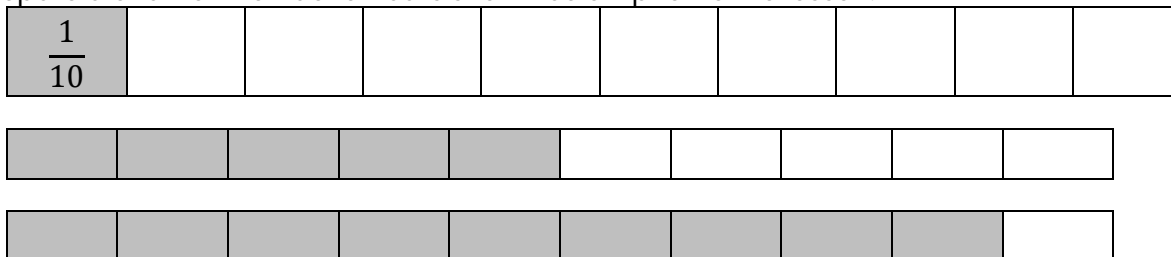
MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Charts



INTRODUCTION

1. Paste the chart or draw the following fraction bars on the board. The teacher should prepare a chart of the fraction bars shown below prior to the lesson.



2. Ask students to name the fraction represented by the shaded part in each bar.
3. Students should say that for the first bar the fraction is $\frac{1}{10}$.
4. Ask students to identify the fractions represented in the 2nd and 3rd bars.
5. Give students a few minutes to discuss in pairs and answer.
6. Record student responses.
7. Tell students
 - For the first bar, the fraction is $\frac{1}{10}$ (as written).
 - for the second bar, the fraction is $\frac{5}{10}$, and
 - for the 3rd bar, the fraction is $\frac{9}{10}$.

3. Give students a few minutes to discuss in pairs and answer.
4. Record student responses.
5. Tell students that the fraction represented by the shaded part is $\frac{1}{100}$.
6. Ask students to express $\frac{1}{100}$ in decimals?
7. Give students a few minutes to discuss in pairs. Record student responses.
8. Tell students that $\frac{1}{100}$ is represented as 0.01 (read as “zero point zero one”) as a decimal i.e.

$$1 \text{ out of } 100 \text{ parts} = \frac{1}{100} \text{ (fraction)} = 0.01 \text{ (decimal)}$$
9. Ask students to discuss in pairs and then come up to the board and write the decimal form of $\frac{7}{100}$, $\frac{48}{100}$, and $\frac{83}{100}$.
10. Use an empty 10 x 10 square like the one shown above and shade 7 parts, 48 parts and then 83 parts to illustrate each example.
11. Ask the students to work in pairs and write the following fractions as decimals in their notebooks.
 - ✧ $\frac{14}{100}$
 - ✧ $\frac{88}{100}$
 - ✧ $\frac{37}{100}$
 - ✧ $\frac{69}{100}$
 - ✧ $\frac{5}{100}$
12. Walk across the classroom and assist students.
13. Solve the questions on the board for students to see the decimal forms of the fractions above.



LESSON 41 CONCLUSION

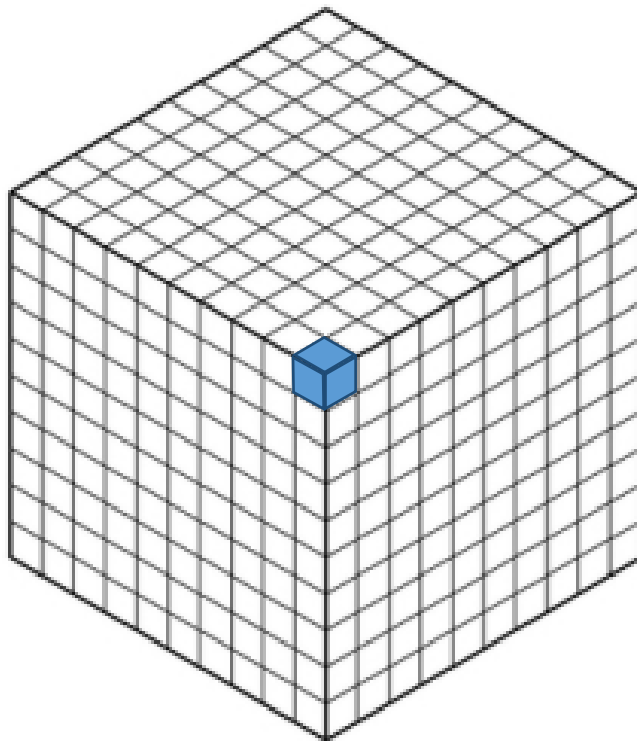
1. Ask students how they can express a proper fraction with a denominator of 10 or 100 as a decimal number. Ask students to give examples of each.
2. After taking students responses recap the key takeaways.

DECIMAL NUMBERS



LESSON 42 INTRODUCTION

1. The teacher should prepare a chart of a cube shape divided into 1000 equal cubes.
2. Paste the chart on the board and ask students to name the fraction represented by the part shaded blue.



4. Give students a few minutes to discuss in pairs and answer.
5. Record student responses.
6. Tell students that the fraction represented by the shaded part is $\frac{1}{1000}$.
7. Ask students to work in pairs and write $\frac{1}{1000}$ in decimals? Give students a few minutes to discuss in pairs. Record student responses.
8. Tell students that $\frac{1}{1000}$ is represented as 0.001 (read as "zero point zero zero one") as a decimal i.e.

$$1 \text{ out of } 1000 \text{ parts} = \frac{1}{1000} \text{ (fraction)} = 0.001 \text{ (decimal)}$$

9. Ask students to discuss in pairs and then come up to the board and write the decimal form of $\frac{8}{1000}$, $\frac{256}{1000}$, and $\frac{893}{1000}$.
10. If possible, use a picture of a blank cube and shade 8 parts, 256 parts and then 893 parts to illustrate each example.
11. Ask the students to work in pairs and write the following fractions as decimals in their notebooks.

To prompt their thinking the teacher may say, "if $\frac{1}{1000}$ equals 0.001 then..."

$$\diamond \frac{144}{1000}$$

$$\begin{array}{r} \diamond \quad \frac{818}{1000} \\ \diamond \quad \frac{37}{1000} \\ \diamond \quad \frac{269}{1000} \\ \diamond \quad \frac{5}{1000} \end{array}$$

3. Walk across the classroom and assist students.
4. Solve the questions on the board for students to see the decimal forms of the fractions above.



CONCLUSION / SUM UP:

1. Ask the students to summarize how to represent a fraction whose denominator is 10, 100 or 1000 as a decimal number. Ask students to give examples of each.
2. After taking students responses recap the key takeaways.



ASSESSMENT

Ask the students to copy and complete the following table:

Fraction	Decimal
$\frac{47}{100}$	
$\frac{1}{10}$	
$\frac{12}{1000}$	
$\frac{53}{100}$	
$\frac{577}{1000}$	



HOMEWORK/FOLLOW UP

Assign Question 1 (all parts) from the textbook on page 76 in exercise 1.

PLACE VALUE OF DIGITS IN DECIMAL NUMBERS



STUDENT LEARNING OUTCOMES

- Identify and recognize the place value of a digit in decimals (up to 3 - decimal places).

INFORMATION FOR TEACHERS

- Teachers should know the place value of the 3 digits to the right of a decimal i.e., the first decimal place is tenths, the second decimal place is hundredths, and the third decimal place is thousandths.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Chart



INTRODUCTION

- Write 756 on the board and ask the students to identify the place value of 7, 5 and 6.
- Students should discuss in pairs and share their responses. The teacher should record their responses.
- Remind students that the place value of 6 is ones, that of 5 is tens and that of 7 is hundreds. Pay special attention to the spelling of each place value.
- Label the place value for each number.
- Now write 0.756 on the board and ask the students about the place values of 7, 5 and 6.
- Students should discuss in pairs and share their responses. The teacher should record their responses.
- Tell student that the place value of 7 is **tenths** the place value of 5 is **hundredths** and 6 is **thousandths**.
- Label the place values as shown below and draw a comparison of the place values of 756 and 0.756.

Ones	.	Tenth	Hundredth	Thousandth
0	.	7	5	6

- Write a few decimal numbers on the board and ask the students to work in pairs and identify the place values of all digits.



DEVELOPMENT

Activity 1:

- Prepare a chart showing the following decimal numbers.

	Hundreds	Tens	Ones	.	Tenths	Hundredths	Thousandths
a)	4	9	0	.	5	3	1
b)	6	3	1	.	3	7	3
c)	3	6	7	.	2	8	1
d)	1	8	9	.	8	9	6
e)	2	0	6	.	4	5	9

- Ask the students to work in pairs and identify the place value of all the digits (whole number part and fractional part) in each number.
- Give students time to discuss. The teacher should call upon certain pairs and ask them the place value of any digit in any question.
- Ask students to clearly differentiate while saying "Tens" and "Tenths", "Hundreds" and "Hundredths".

Activity 2:

- Write the following numbers on the board.
- Ask the students to work in pairs and to draw a place value chart in their notebooks and then fill it with the following numbers:
 - ✧ 54.786
 - ✧ 179.23
 - ✧ 12.47
 - ✧ 999.12
 - ✧ 9.7
- Ask students from different pairs to come on the board, one by one, and identify the place value for each number.
- Assist students where necessary.



CONCLUSION / SUM UP:

- Conclude the activity by explaining that every digit in a decimal number has a specific place value.
- We can identify the place value of any digit (to the right of the decimal) by its placement in a place value chart.



ASSESSMENT

- Ask the students to copy the following question in their notebooks:

Fill the following table with the numbers below:

- ✧ 369.758
- ✧ 28.987
- ✧ 6.781

	Hundreds	Tens	Ones	.	Tenths	Hundredths	Thousandths
a)							
b)							
c)							

Fill in the blanks from the above chart

- ✧ In 369.758 the place value of 5 is _____
- ✧ In 28.987 the place value of 7 is _____
- ✧ In 6.781 the place value of 1 is _____



HOMEWORK / FOLLOW UP

Assign Question 2 from the textbook on page 76 in exercise 1.

CONVERSION OF FRACTION TO DECIMAL



STUDENT LEARNING OUTCOMES

- Convert a given fraction to a decimal if:
 - ✧ Denominator of the fraction is 10, 100, or 1000

INFORMATION FOR TEACHERS

- Teachers should be able to write fractions as decimal numbers when fractions have denominators of 10, 100 or 1000.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils



INTRODUCTION

- Remind students that each fraction can be converted into decimal by long division.
- Remind students that if the denominator of the fraction is 10, 100, or 1000 then it is easy to convert the fraction into a decimal, for e.g., $\frac{3}{10}$ can be written as 0.3. We can show this by using long division without remainders. See below:

$$\begin{array}{r}
 0 \bullet 3 \\
 10 \overline{) 3 \bullet 0} \\
 \underline{- 0} \\
 3 \\
 \underline{- 3} \\
 0
 \end{array}$$

- Tell students, if 3 or 3.0 (mention that the decimal point is invisible but is still there) is being divided by 10

then the decimal point moves one place to the left (0 3. 0) and 3.0 becomes 0.30



- Similarly, if 3.0 is being divided by 100

then the decimal point moves two places to the left (0 0 3. 0) and 3.0 becomes 0.03. The number of 0s in the denominator (after the 1) determines how many places the decimal



moves to the left.

5. Lastly if 3.0 is being divided by 1000

then the decimal point moves three places to the left (0 0 3. 0) and 3.0 becomes 0.003. The number of 0s in the denominator (after the 1) determines how many places the decimal moves to the left.



Activity 1:

1. Ask the students to work in pairs and copy and complete the following questions in their notebooks:
 - ✧ Convert $\frac{9}{10}$ to a decimal
 - ✧ Convert $\frac{67}{100}$ to a decimal
 - ✧ Convert $\frac{256}{1000}$ to decimal
2. Help pairs as they answer each question in their notebooks.
3. Remind students to count the zeros in the denominator to find how many places the “invisible” decimal point moves to the left.
4. Ask students to share their answers. Provide guidance to the students to arrive at the correct answers.

Activity 2:

1. Ask the students to work in pairs and write the following fractions as decimals in their notebooks.
 - ✧ $\frac{28}{100}$
 - ✧ $\frac{4}{10}$
 - ✧ $\frac{975}{1000}$
 - ✧ $\frac{6}{100}$
 - ✧ $\frac{77}{1000}$
2. Ask students to share their answers. Provide guidance to the students to arrive at the correct answers.



CONCLUSION / SUM UP:

1. Ask the students to summarize how to represent a fraction whose denominator is 10, 100 or 1000 as a decimal number.
2. Ask students to come up to the board and demonstrate writing $\frac{6}{10}$ as a decimal number.
3. Ensure that students recall that a fraction such as $\frac{6}{10}$ can be written as 0.60 i.e., if 6.0 is being divided by 10 then the decimal point moves one place to the

left (0 6. 0) and 6.0 becomes 0.60



4. Students should mention that the number of 0s in denominator (after the 1) determine how many places the decimal moves to the left.



ASSESSMENT

Ask the students to copy and complete the table given below in their notebooks. The first one has been done for you.

Fraction	Number of zeroes in the denominator	Decimal Number
$\frac{4}{10}$	1	0.4
$\frac{17}{100}$		
$\frac{185}{100}$		
$\frac{143}{1000}$		
$\frac{1231}{1000}$		



HOMEWORK / FOLLOW UP

Assign the relevant questions from the textbook on page 81 in exercise 1.

CONVERSION OF FRACTION TO DECIMAL



STUDENT LEARNING OUTCOMES

- Convert a given fraction to a decimal if:
 - ✧ Denominator of the fraction is not 10, 100 or 1000 but can be converted to 10, 100 or 1000

INFORMATION FOR TEACHERS

Teachers should be able:

1. Be able to write fractions as decimal numbers when fractions have denominators of 10, 100 or 1000.
2. Understand how to find equivalent fractions when denominators are not 10, 100 or 1000 to make denominators equal to 10, 100 or 1000.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Materials / Resources Required:

Board, Marker, Notebooks, Textbooks, Pencils



INTRODUCTION

1. Remind students that if the denominator of the fraction is 10, 100, or 1000 then it is easy to convert the fraction into a decimal for e.g., $\frac{3}{10}$ can be written as 0.3.
2. Recall that the number of 0s in the denominator (after the 1) determine how many places the decimal moves to the left.
3. Write the following fraction on the board:

$$\frac{3}{5}$$

4. Ask students how we can write the fraction above as a decimal without using long division. Let students think about the question for a few minutes.
5. Ask students what are some of the equivalent fractions of $\frac{3}{5}$?
6. After taking a few responses, remind students that multiplying a fraction with the same numerator and denominator gives us an equivalent fraction.
7. In this example, they need to find a number which when multiplied by the denominator (i.e., 5) would give 10 and then multiply the numerator with the same number.
8. Guide students to arrive at $\frac{3}{5} \times \frac{2}{2} = \frac{6}{10}$
9. Now ask students how can we write $\frac{6}{10}$ as a decimal number?
10. Students should be quick to say 0.6

Tell students that the decimal form of $\frac{3}{5}$ is 0.6 because $\frac{6}{10}$ is equivalent to $\frac{3}{5}$.

11. Tell students that we can convert denominators of fractions that are not 10, 100 or 1000 to 10, 100 or 1000.
12. Once those fractions have denominators that are 10, 100 or 1000 we can convert them to decimal numbers with ease and efficiency.



DEVELOPMENT

Activity 1:

1. Ask the students to work in pairs. Copy and solve the following questions in their notebooks:
 - ✧ Convert $\frac{7}{5}$ into decimals
 - ✧ Convert $\frac{7}{25}$ into decimals
 - ✧ Convert $\frac{14}{500}$ into decimal
2. After the students have answered the questions, ask a few students to come to the board to show their working.
3. Help them where needed.



CONCLUSION / SUM UP:

1. Ask students to summarize how to represent a fraction as a decimal whose denominator is 10, 100 or 1000.
2. Students should summarize how to represent a fraction whose denominator is not 10, 100 or 1000 as a decimal number.
3. Students should highlight how to find equivalent fractions when denominators are not 10, 100 or 1000.



ASSESSMENT

1. Ask the students to copy and complete the following questions in their notebooks.
2. Find equivalent fractions where denominators are 10, 100 and 1000.
 - ✧ Convert $\frac{3}{5}$ into decimals
 - ✧ Convert $\frac{42}{50}$ into decimals
 - ✧ Convert $\frac{73}{500}$ into decimals



HOMEWORK/FOLLOW UP

Assign the relevant questions from the textbook on page 81 in exercise 1.

CONVERSION OF DECIMAL TO FRACTION



STUDENT LEARNING OUTCOMES

- Convert a decimal (up to 3 – decimal places) to fraction.

INFORMATION FOR TEACHERS

- Teachers should be able to convert decimals into fractions by writing the decimals in the form of tenths, hundredths and thousandths i.e. if 4.7 needs to be written as a fraction, it should be represented as $\frac{47}{10}$.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils



INTRODUCTION

- Write the following decimal number on the board:

0.673

- Write the decimal 0.673 in form of tenths, hundredths and thousandths as:

$$\begin{array}{rclcl}
 0.673 & = & 0 \text{ Ones} & + & 6 \text{ tenths} & + & 7 \text{ hundredths} & + & 3 \text{ thousandths} \\
 & = & 0 & + & \frac{6}{10} & + & \frac{7}{100} & + & \frac{3}{1000}
 \end{array}$$

Show students that they can put an equal number of zeroes in the numerator and the denominator without changing the fraction. The teacher should make all denominators 1000 as follows:

$$= 0 + \frac{600}{1000} + \frac{70}{1000} + \frac{3}{1000}$$

Add the fractions with the same denominators. We get:

$$0.673 = \frac{673}{1000}$$

- Ask students to think of how can we convert this decimal number into a fraction in a quicker and more efficient manner? Give students a few minutes to discuss in pairs. Record student observations.
- Tell students that to convert a decimal number into a fraction, we move the decimal point to the right. In this example the decimal point will move three places to the right. See below:

0 . 6 7 3

5. If the decimal point moves 3 places to the right that should be the number of 0s (after the 1) that should come in the denominator.
6. Therefore, $0.673 = \frac{673}{1000}$.
7. Tell students that similarly, other decimal numbers can also be easily converted to fractions.



DEVELOPMENT

Activity 1:

1. Write the following numbers on the board. 0.3
 - ✧ 0.89
 - ✧ 0.692
 - ✧ 1.713
 - ✧ 5.864
2. Tell the students to work in pairs and convert the decimal numbers into fractions. The fractions should have denominators 10, 100 or 1000.
3. Ask a student from different pairs to come to the board and solve the different parts.
4. The teacher should provide input in solving the problem if needed.

Activity 2:

1. Write the following decimal number on the board:
1.5
2. Ask the students how can we convert the decimal number into a fraction? Give students a few minutes to discuss in pairs and record their responses.
3. Guide students to arrive at the correct answer of $\frac{15}{10}$
4. Now ask students, do 15 and 10 have any common factors? Give students a few minutes to discuss in pairs and record their responses.
5. Guide students to arrive at the answer yes, i.e. 15 and 10 have a common factor of 5 which indicates that $\frac{15}{10}$ can also be written as $\frac{3}{2} \times \frac{5}{5} = \frac{15}{10}$ or simply as $\frac{3}{2}$ in its simplest form.
6. As this is an improper fraction, $\frac{3}{2}$ can also be written as $1\frac{1}{2}$ in terms of a mixed number.

Activity 3:

1. Individually convert the following decimal numbers as fractions representing each fraction in its simplest terms.
 - ✧ 1.6
 - ✧ 7.8
 - ✧ 5.45
 - ✧ 7.74
 - ✧ 8.92
2. Walk across the classroom and assist the students where needed.



CONCLUSION / SUM UP:

1. Ask students to summarize the steps in the conversion of a decimal number to fraction.

2. Students should demonstrate that if the decimal point moves 2 places to the right then that is the number of 0s (after the 1) that should come in the denominator. For example, 1.4 becomes $\frac{14}{10}$, 0.37 becomes $\frac{37}{100}$, and 1.786 becomes $\frac{1786}{1000}$.



ASSESSMENT

Ask the students to convert the following decimals into fractions in their notebooks.

- a. 0.341
- b. 1.401
- c. 2.187



HOMEWORK/FOLLOW UP

Assign the relevant questions from the textbook on page 81 in exercise 1.

ADDITION AND SUBTRACTION OF THREE DIGIT DECIMAL NUMBERS



STUDENT LEARNING OUTCOMES

- Add and subtract 3 - digit numbers (up to 2-decimal places)

INFORMATION FOR TEACHERS

Teachers should be able:

1. To add numbers i.e. align the ones digit with the ones digit, the tens with the tens and so on.
2. To align tenths, hundredths and thousandths.
3. To understand that addition starts with the smallest place value.
4. To align numbers and carry out subtraction i.e. ones digit should be aligned with ones digit, tens with tens and so on. On the right of the decimal.
5. To understand that subtraction starts with the smallest place value.
6. To understand carrying and borrowing for addition and subtraction of decimal numbers.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils.



INTRODUCTION

1. Ask students to individually solve $4.52 + 6.73$.
2. Draw the following place value chart on the board and ask students to fill in the digits as follows in their notebooks

	Tens	Ones	.	Tenths	Hundredths
		①			
		4	.	5	2
+		6	.	7	3
	1	1	.	2	5

3. Tells the students to follow the steps below:
 - ✧ add hundredths with hundredths and carry over to tenths (where needed)
 - ✧ add tenths with tenths and carry over to ones (where needed)
 - ✧ add ones with ones and carry over to tens (where needed)

4. Tell students that we can add these decimal numbers using the same rule as for the addition of whole numbers. However, we must start with the smallest place value or the rightmost digits.
5. Furthermore, in the subtraction of decimal numbers we also start from the hundredths column and move towards the left.
6. Emphasize that the decimal stays in the same place in addition and subtraction, both.
7. Take student responses on the board and show them the correct solution.



DEVELOPMENT

Activity 1:

1. Write the following question on the board:
 $5.34 - 2.17$
2. Draw the place value chart as shown on the board and place the digits in the correct places.
3. Ask students to work in pairs and solve the question in their notebooks. Give student a few minutes and conduct a walk through class and guide the students.
4. The complete solution is shown below:

	Tens	Ones	.	Tenths	Hundredths
				(2)	(1)
		5	.	3	4
-		2	.	1	7
		3	.	1	7

5. Remind students about the importance of starting the subtraction with the smallest place value or the rightmost digits.
6. Tell the students to subtract hundredths from hundredths, tenths from tenths and ones from ones.

Activity 2:

1. Ask the students to work in pairs. Copy and solve the following questions in their notebooks:
2. Use a place value chart for each question.
 - ✧ $6.34 + 8.75$
 - ✧ $9.54 - 5.77$
 - ✧ $2.33 + 8.66$
 - ✧ $54.59 - 43.99$
 - ✧ $49.3 + 21.7$
3. Assist the students to use the place value chart correctly for setting up these sums.



CONCLUSION / SUM UP:

1. Ask students how we add numbers. Elicit from students the importance of aligning the ones digit with the ones digit, the tens with the tens and so on. To the right of the decimal,

students should emphasize the importance of aligning tenths, hundredths and thousandths and to start addition with the smallest place value.

2. Ask students how we subtract numbers. Elicit from students the importance of aligning the ones digit with the ones digit, the tens with the tens and so on. On the right of the decimal, students should emphasize aligning tenths, hundredths and thousandths. Students should recall starting subtraction with the smallest place value.
3. Ask students when do we carry a number over and when do we borrow. Students should discriminate when to carry and when to borrow when carrying out the addition and subtraction of decimal numbers respectively.



ASSESSMENT

Ask students to discuss and solve the following questions in pairs.

- ✧ Find the sum and difference between 4.92 and 2.65
- ✧ Find the sum and difference between 9.80 and 2.06
- ✧ Find the sum and difference between 3.07 and 1.25



HOMEWORK/FOLLOW UP

Assign the relevant questions from Exercise 3 on page 83.

MULTIPLICATION OF DECIMAL NUMBERS



STUDENT LEARNING OUTCOMES

- Multiply a 2-digit number (up to 1 decimal place) by 10, 100, and 1000.

INFORMATION FOR TEACHERS

1. Teachers should know that to multiply any decimal number by 10, the decimal point moves 1 place to the right; with 100 it moves 2 places to the right and with 1000 it moves 3 places to the right.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Flashcards



INTRODUCTION

1. Tell the students that in a decimal number the position of decimal point is quite important. Consider the number 7.9
2. If the decimal point moves towards the left the number becomes smaller as 0.79 is smaller than 7.9
3. If the decimal moves towards the right the number becomes larger as 7.9 is 79 is larger than 7.9
4. When we multiply a decimal number by 10 the position of decimal point shifts 1 place value to the right.
5. When we multiply a decimal number by 100 the position of decimal point shifts 2 place values to the right.
6. When we multiply a decimal number by 1000 the position of decimal point shifts 3 place values to the right.

Activity 1:

1. Divide the class into five groups.
2. Distribute flashcards with the following questions written on them.
 - ✧ 7.9×10
 - ✧ 8.2×100
 - ✧ 5.4×1000
 - ✧ 3.1×100
 - ✧ 6.8×10
3. Ask the groups to solve the questions.
4. After a group answers the question written on the flashcard, they will pass it on to the next group.

5. Each group must do all questions.
6. After completing the task, a representative from each group will write their answer, to at least one question, on the board and the teacher will discuss with the whole class.
7. Similarly all questions will be discussed one by one.
8. The teacher will share input if needed.



CONCLUSION / SUM UP:

The teacher should ask students to summarize the rule of multiplying a decimal number by 10, 100 or 1000 i.e. when we multiply any decimal number by 10, the decimal point moves 1 place to the right; with 100 it moves 2 places to the right and with 1000 it moves 3 places to the right.



ASSESSMENT

1. Randomly select students from the class to solve the following questions on the board:
 - ✧ 6.1×10
 - ✧ 5.9×100
 - ✧ 0.6×1000



HOMEWORK/FOLLOW UP

Assign the relevant questions from the textbook on page 87 in exercise 4.

MULTIPLICATION OF TWO DIGIT DECIMAL NUMBERS



STUDENT LEARNING OUTCOMES

- Multiply a 2-digit number with 1 decimal place by a 1-digit number.

INFORMATION FOR TEACHERS

Teachers should know that:

1. To multiply any decimal number by a 1-digit number, the multiplication should start with the smallest place value i.e. the tenths digit.
2. The multiplication of a decimal number with a 1-digit number is quite similar to the multiplication of a 2-digit number with a single-digit number.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils



INTRODUCTION

1. Write the following question on the board

$$2.5 \times 7$$

2. Tell the students that the steps in the multiplication of a decimal number with a 1-digit number are quite similar to the steps in the multiplication of a two-digit number with a 1-digit number.
3. Guide students to fill in the following grid/table with the correct numbers in the correct places. See below:

Tens	Ones	.	Tenths
	3		1
	2	.	5
×			7
<hr/>			
1	7	.	5

4. Demonstrate each step to the students.
5. Count the number of digits in the decimal part which is one. Therefore, place the decimal point after one digit from the right as shown above.
6. By multiplication, we get 17.5.
7. Tell students that in today's lesson we will be multiplying a 2-digit number with 1 decimal place by a 1-digit number.



DEVELOPMENT

Activity 1:

6. Ask the students to work in pairs.
7. Copy and complete the following questions in their notebooks. Use a grid/table as the one shown above.
8. Walk across the classroom and help pairs where necessary.
 - ✧ 4.5×7
 - ✧ 6.2×3
 - ✧ 7.8×5
 - ✧ 8.5×4
 - ✧ 1.4×6
 - ✧ 9.9×9
9. Ask a few students to solve any three questions on the board.
10. Guide students to arrive at the correct answers.



CONCLUSION / SUM UP:

1. Ask students to sum up the steps in multiplication of a decimal number with a 1-digit whole number. Students should mention that to multiply any decimal number by a 1-digit number, the multiplication should start with the smallest place value i.e. the tenths digit.
2. Prompt students to mention that the multiplication of a decimal number with a 1-digit number is quite similar to the multiplication of 2-digit numbers with a single digit and carrying should be done wherever needed.



ASSESSMENT

Ask 3 students to voluntarily to solve the following questions on the board. Other students should suggest corrections if any after students have solved the questions.

- ✧ 5.6×6
- ✧ 9.3×9
- ✧ 8.9×7



HOMEWORK/FOLLOW UP

Assign the relevant questions from the textbook in exercise 4 on page 87.

DIVISION OF DECEIMAL NUMBERS



STUDENT LEARNING OUTCOMES

- Divide a 2-digit number with 1-decimal place by a 1 - digit number
- Solve real-life situations involving 2-digit numbers with 1-decimal place using appropriate operations.

INFORMATION FOR TEACHERS

Teachers should know that:

1. To divide any decimal number by a 1-digit number the division should start with the largest place value i.e. the digit to the most left.
2. The division of a decimal number with a 1-digit number is quite similar to the division of a 2-digit number with a single-digit number.



DURATION / NO OF PERIODS: 2 LESSONS / 35 + 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Flashcards, Chart



INTRODUCTION

1. Write the following question on the board:

$$9.6 \div 8$$

2. Tell students that the division of 9.6 by 8 is quite similar to dividing 96 by 8. However, we must be careful of the decimal point.
3. Ask students to work in pairs and attempt the question. Give them a few minutes. Record student responses.
4. Use the following grid/table and show students the solution. See below:

	1	.	2
8	9	.	6
-	8		
	1		6
	1		6
	0		0

5. Show students that 9.6 divided by 8 is 1.2
6. Direct student attention to the specific placement of the decimal point.

7. Ask students to note down the example in their notebooks.



DEVELOPMENT

Activity 1:

1. Ask the students to work in pairs.
2. Copy the following questions in their notebooks:
 - ✧ $4.2 \div 7$
 - ✧ $6.9 \div 3$
 - ✧ $3.5 \div 5$
 - ✧ $4.8 \div 4$
 - ✧ $1.2 \div 6$
 - ✧ $9.9 \div 9$
3. Ask a student from a pair to voluntarily to solve the first question on the board. Guide the student at each step and help them answer correctly.
4. Walk around the classroom and help different pairs where needed.



LESSON 50 CONCLUSION:

1. Tell students to copy any unfinished questions in their notebooks and individually complete all the questions and bring them to the next lesson.

DIVISION OF DECIMAL NUMBERS



LESSON 51 INTRODUCTION:

1. Ask students to voluntarily and come up to the writing board and solve each question. Ask other students to also give their input.
2. Share the correct answers with the students by solving the problems on the writing board.
3. Tell students that in today's lesson we will solve some real life problems to develop fluency in the concept.

Activity 2:

1. Divide the class into 4 groups.
2. Distribute flashcards with the following questions written on them.
3. After a group discusses and solves their flashcard, they will pass it on to the next group.
4. Each group must do all questions written on the flashcards.
 - ✧ Nazia wants to divide 8.8 kg of rice into 4 equal packets. How many kilograms of rice are in each packet?
 - ✧ The length of one toy car is 7.5 cm. How much space is needed to line up 100 such cars end to end?
 - ✧ A tailor uses 1.2 meters of cloth to make a waistcoat. He receives an order for 9 identical coats. How much cloth will he need?
 - ✧ A bakery needs 7.6 grams of sugar for each cake. It receives an order for 1000 cakes. How much sugar is needed?
5. Ask for voluntarily to come to the board and solve the questions
6. Ask other students to give their input as the student solves the question.
7. After all the questions have been attempted, show the correct solutions on a chart prepared prior to the lesson.



CONCLUSION / SUM UP:

1. Ask students to list the key steps in dividing a decimal number by a 1 digit number.
2. Students should highlight that the division of a decimal number with a 1-digit number is quite similar to the division of a 2-digit number with a single-digit number.



ASSESSMENT

1. Ask students to voluntarily to solve the following questions on the board:
 - ✧ Solve $7.2 \div 9$
 - ✧ Solve $7.5 \div 5$
 - ✧ Solve $6.9 \div 3$



HOMEWORK/FOLLOW UP

Assign the relevant questions from the textbook on page 87 in exercise 4.

Month

6

ROUND OFF DECEIMALS



STUDENT LEARNING OUTCOMES

- Round off decimal (with 1 or 2 decimal places) to the nearest whole number.

INFORMATION FOR TEACHERS

Teachers should know that the rounding rule is to look at the digit to the right of the one when we are rounding to.

- If it is 5 or more, then round up.
- If it is less than 5, then round it down.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



INTRODUCTION

- Write the following on the board.

Ones	.	Tenths
6	.	8

- Tell students that we will round off to the nearest whole number.
- Ask students to attempt the question in pairs. Tell students the following:
The rounding rule is to look at the digit to the **right** of the one when we are rounding to:
 - If it is 5 or more, then round up.
 - If it is less than 5, then round it down.
- Give students a few minutes to attempt and share their responses. Record student responses.
- Tell students that if 6.8 is to be rounded off to the nearest **whole number** then we must look at the digit to the right of that **whole number i.e. 6**. The number to consider is 8. Since 8 is greater than 5 we round **up** and the number becomes 7. We write $6.8 \approx 7$ (rounded off to the nearest whole number)
- Consider the following number
 3.48
- Ask students to work in the same pairs and round off to the nearest whole number. Give students a few minutes to attempt and share their responses. Record student responses.
- Tell students that as before we must look at the digit to the right of the **whole number i.e. 3**. The number to consider is 4. Since 4 is less than 5 we round **down** and the number becomes 3. We write $3.48 \approx 3$ (rounded off to the nearest whole number).



DEVELOPMENT

Activity 1:

- Ask students to come to the board and solve the following questions:

2. Round off to the nearest whole number. Remember to use the symbol " \approx "
 - a) 3.7
 - b) 87.8
 - c) 1.35



CONCLUSION / SUM UP:

1. Ask students what is the rounding rule. Give examples.
2. Students should summarize that the rounding rule is to look at the digit to the right of the one they are rounding up to.

If it is 5 or more, then round up. However, if it is less than 5, then round it down. For example, if 8.7 is rounded off to the nearest whole number, we look at the digit to the right of the whole number i.e. 8. In this question, the number to consider is 7. As 7 is greater than 5, 8.7 becomes 9 and we write $8.7 \approx 9$ (rounded off to the nearest whole number)



ASSESSMENT

1. Ask students to come up to the writing board and round off the following decimal numbers to the nearest whole number:
 - ✧ 6.7
 - ✧ 5.3
 - ✧ 8.85
 - ✧ 78.63
 - ✧ 89.49
2. The teacher should provide guidance wherever needed.



HOMEWORK/FOLLOW UP

Assign the relevant questions from the textbook on page 90 in exercise 5.

ROUND OFF DECEIMALS



STUDENT LEARNING OUTCOMES

- Round off a whole number to the nearest 10, 100, and 1000.

INFORMATION FOR TEACHERS

Teachers should know that the rounding rule is to look at the digit to the right of the one when we are rounding to:

- If it is 5 or more, then round up.
- If it is less than 5, then round it down.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



INTRODUCTION

- Write the following on the board:

H	T	O
3	6	7

- Tell students that we need to:
 - Round off to the nearest 10
 - Round off to the nearest 100
- Ask students to attempt the question in pairs. Tell students the following:
The rounding rule is to look at the digit to the **right** of the one when we are rounding to:
 - If it is 5 or more, then round up.
 - If it is less than 5, then round it down.
- Give students a few minutes to attempt and share their responses. Record student responses.
- Tell students if 367 is rounded off to the nearest **ten** then we must look at the digit to the right of the **tens** digit which is 6. Therefore, the number to consider is 7. Since 7 is greater than 5 we round **up** and the number becomes 370. We write $367 \approx 370$ (rounded off to the nearest 10).
- If 367 is rounded off to the nearest **hundred** then we must look at the digit to the right of the **hundreds** digit which is 3. Therefore, the number to consider is 6. Since 6 is greater than 5 we round **up** and the number becomes 400. We write $367 \approx 400$ (rounded off to the nearest 100)
- Similarly, we can round off other numbers to the nearest 10, 100, or 1000. In today's lesson we will learn more about that.



DEVELOPMENT

Activity 1:

- Ask the students to work in pairs.

2. Copy and complete the following questions in their notebooks. Remember to use the symbol " \approx "

✧ 4374

- i. Round off to the nearest 10
- ii. Round off to the nearest 100
- iii. Round off to the nearest 1000

✧ 8738

- iv. Round off to the nearest 10
- v. Round off to the nearest 100
- vi. Round off to the nearest 1000

✧ 1357

- vii. Round off to the nearest 10
- viii. Round off to the nearest 100
- ix. Round off to the nearest 1000

3. Ask a few students to voluntarily and come to the board to solve the above questions.
4. Guide the voluntarily to get the correct solutions.



CONCLUSION / SUM UP:

1. Guide student discussion so that students summarize the rounding rule is to look at the digit to the right of the one they are rounding to i.e. if it is 5 or more, then round up. However, if it is less than 5, then round it down.



ASSESSMENT

1. Ask for 3 student voluntarily to round off the following numbers to the nearest 10, 100, and 1000. Other students should provide feedback.
- ✧ 3621
 - ✧ 7826
 - ✧ 4444



HOMEWORK/FOLLOW UP

Assign the relevant questions from the textbook on page 90 in exercise 5.

LENGTH



STUDENT LEARNING OUTCOMES

- Use standard metric units to measure the length of different objects.

INFORMATION FOR TEACHERS

Teachers should know:

1. That the length of short objects such as books, table, pencils etc. can be measured in centimeters (cm) and the length of longer objects such as the classroom, board, a small tree can be measured in meters (m). The distance between cities and countries is measured in kilometers.
2. How to measure different items in centimeters and meters.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Various items to measure, 4 x 1 meter rulers



INTRODUCTION

1. Write the names of the following objects on the writing board
 - ✧ Table
 - ✧ Boundary wall of the school
 - ✧ Pencil
 - ✧ Book
 - ✧ Distance between Peshawar and Abbottabad
2. Demonstrate how to measure the length of the writing board with a meter ruler. They teacher should say the measurement out loud for e.g. 2 meters and 12 cm.
3. Ask the students what are the lengths of the above mentioned objects measured in? cm, m or km?
4. Guide students and tell them that we use centimeters when we measure small items. We measure cloth using a meter rod and long distances are measured in kilometers.



DEVELOPMENT

Activity 1:

1. Divide the class into small groups.
2. Go to each group and demonstrate the measurement of a small object like a book and show students the relevant markings on the ruler and how to record the measurement of length.

3. Give each group different items like pencils, sharpeners, erasers, books, pencil case along with a ruler.
4. Ask each group to measure the length of these items and record these measurements in their notebooks.
5. Wherever needed, the teacher should guide and assist students in measuring and recording.

Activity 2:

1. Give a meter ruler to each group and ask them to measure the height of the desk, the height of the chair and the length of one wall of the classroom.
2. Ask each group to measure these items and record the measurements in their notebooks.
3. Guide and help the students in measuring and recording.
4. All the groups will then share their answers with the class.
5. Explain that there might be a difference in their answers as each group might not have measured accurately. Point out common mistakes, for example not placing the 0 mark on the meter ruler at where the desk starts.



CONCLUSION / SUM UP:

1. Ask students how we measure the length of different objects.
2. Students should highlight how a ruler is used for the measurement of the lengths of small objects. They should highlight that for the measurement of longer and larger things we use meters, for large distances we use kilometers and the measuring unit for smaller objects is centimeters.



ASSESSMENT

Make the following table on the writing board and ask student to place a check / tick in the correct column. Students should copy and complete the table below in their notebooks. Correct answers are shown for teacher's reference.

Length	Kilometers	Meters	Centimeters
Distance between home and school is measured in...	✓		
Length of a piece of cloth is measured in...		✓	
Length of a sharpener is measured in...			✓
Height of the desk in the classroom is measured in...		✓	
Width of the wall in class is measured in...		✓	
Length of the pencil			✓
Thickness of the book			✓



HOMEWORK / FOLLOW UP:

Homework / Follow up:

Assign the relevant questions from the textbook on page 98 in exercise 1.

CONVERSION OF LENGTH



STUDENT LEARNING OUTCOMES

- Convert larger to smaller metric units (2-digit numbers with one decimal place)
 - ✧ Kilometers into meters
 - ✧ Meters into centimeters
 - ✧ Centimeters into millimeters

INFORMATION FOR TEACHERS

1. Teachers should be able to convert kilometers, meters, centimeters and millimeters into smaller metric units i.e.
 - ✧ $1 \text{ km} = 1000 \text{ m}$
 - ✧ $1 \text{ m} = 100 \text{ cm}$
 - ✧ $1 \text{ cm} = 10 \text{ mm}$



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Chalk, Marker, Textbook, Notebook/Copy, Meter ruler.



INTRODUCTION

1. Show the meter ruler to the students and ask what it is used for.
2. Help students to get the right answer i.e. measuring the length of various medium sized objects.
3. Ask a student to measure the length of the board.
4. The student should measure in meters i.e. 1 meter, 2 meters ... and the last reading should be in centimeter.
5. Say the last reading is 36 centimeters.
6. Write on the board 2 m and 36 cm
7. Ask how can we write the length of the board in cm i.e. How can we convert 2 m into cm? (hint: $1 \text{ m} = 100 \text{ cm}$).
8. Ask students to raise their hands and give their answers. Tell students that we can multiply 2 with 100 to convert 2 meters to 200 centimeters.
9. Guide students to get to the right answer i.e. add 36 cm to 200 cm to get the length of the board as 236 cm.
10. Repeat the process for the height of the board.
11. Ask students to write the following conversions in their notebooks:
 - ✧ $1 \text{ km} = 1000 \text{ m}$
 - ✧ $1 \text{ m} = 100 \text{ cm}$
 - ✧ $1 \text{ cm} = 10 \text{ mm}$



DEVELOPMENT

Activity 1:

- Ask students to copy and answer the following questions in their notebooks:
 - The length of a pen is 14 cm. What is the length in mm? (hint: multiply 14 with 10)
 - The height of the teacher desk is 1m and 13 cm. What is the height of the desk in cm? (hint: multiply 1 with 100 and then add 13)
 - Ali and Amir are best friends. The distance between their houses is 14 km. What is the distance in meters? (hint: multiply 14 with 1000)

Activity 2:

- Ask the students to work in pairs.
- Copy and complete the table given below.
- Answer the first question on the board and show all steps.

#	Length	Convert to
i	3 km 812 m	Meters = 3812 m
ii	23 km 47 m	Meters =
iii	13 m and 14 cm	Centimeters =
iv	65 cm	Millimeters =
v	42 cm and 17 mm	Millimeters =

- Write the correct answers for all the parts and ask students to make corrections in their notebooks.



CONCLUSION / SUM UP:

- Ask students to provide an explanation of the steps required in the conversion of:
 - meters to centimeters
 - kilometers to meters
 - centimeters to millimeters
- Students should touch upon all the key points mentioned in the Introduction.



ASSESSMENT

- Ask students the following questions:
 - How many meters are there in 1 kilometer? Correct answer: 1000m in 1 km
 - How many centimeters are there in 1 meter? Correct answer: 100 cm in 1 m
 - How many millimeters are there in 1 cm? Correct answer: 10 mm in 1 cm



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 98 in exercise 1.

ADDITION AND SUBTRACTION OF LENGTH



STUDENT LEARNING OUTCOMES

- Add and subtract measures of length in the same unit.

INFORMATION FOR TEACHERS

Teachers should be able:

- To convert kilometers, meters, centimeters and millimeters to smaller units i.e.
 - 1 km = 1000 m
 - 1 m = 100 cm
 - 1 cm = 10 mm
- To align like terms with like terms and add lengths in the same unit.



DURATION / NO OF PERIODS: 2 LESSONS / 35 + 35 MINUTES.



MATERIALS / RESOURCES REQUIRED

- Board, Chalk, Marker, Textbook, Notebooks.



INTRODUCTION

- The teacher introduces the following real-life situation to students.
Minahil walks 2 km and 400 m to school. She later comes back home from a shortcut which is 2 km and 150 m. What is the total distance traveled by Minahil?
- To answer the question, ask students to make the table like the one shown below and enter the numbers under the correct place value headings.
- Students should carry out addition as per normal.

	Kilometer	Meter		
	2	4	0	0
+	2	1	5	0
	4	5	5	0
- After aligning and adding, the students should answer that Minahil walked 4 km and 550 meters.
- Ask students to give the final answer in meters. Record student responses and tell students that 4 km and 550 meters can be expressed as $4000 + 550 = 4550$ meters.



DEVELOPMENT

Activity 1:

- Ask students to work in pairs.

2. Copy and answer the following questions in their notebooks:
 - ✧ The distance between Fareeha's home and the office is 5 km 320 m. The distance between her office and the park is 4 km 470 m.
 - ✧ What is the total distance from Fareeha's home to the park?
 - ✧ Amna walks 1 km and 550 m to school every day. Hasan walks 3 km and 770 m daily. How much **more** does Hasan walk to school every day?
3. Monitor and facilitate pairs during the activity.
4. Ask a few students to write their calculations on the board.
5. Let other students help the student get to the correct answer.



CONCLUSION

1. Ask students what are some things to look out for in the addition and subtraction of measures of length in the same unit.
2. Students should mention the importance of aligning like terms with like terms and then adding and subtracting lengths in the same unit.

ADDITION AND SUBTRACTION OF LENGTH



INTRODUCTION

1. Tell students that in the previous lesson we added and subtracted measures of length in the same unit and in this lesson we will so some more questions to develop mastery in the concept.

Activity 2:

1. Draw the following table on the writing board.
2. Ask the students to work in pairs and copy and complete the following table in their notebooks:

	Length 1	Length 2	Addition (Sum)	Difference (Subtraction)
I	6km 890 m	5 km 590 m		
li	893 km 347 m	572 km 111 m		

	Length 1	Length 2	Addition (Sum)	Difference (Subtraction)
i	7km 234 m 65 cm	2 km 344 m 24 cm		
ii	5 m 87 cm 53 mm	3 m 41 cm 22 mm		

3. Ask some students to voluntarily and fill in their answers in the table drawn on the board.
4. Guide students and write the correct answers after students have attempted the questions.



CONCLUSION / SUM UP:

1. Ask students to summarize the steps involved in adding and subtracting measures of length in the same unit.
2. Students should emphasize the importance of aligning km with km, meters with meters, cm with cm, and mm with mm.
3. Students should also mention how to convert km to m.



ASSESSMENT

1. Solve the following questions and then fill in the blanks.
2. After students have attempted the questions, give them the correct answers for self-assessment.

	Kilometer	Meter			Centimeter		Millimeter	
	6	3	7	9	5	6	2	4
+	1	7	2	0	3	1	6	5

The addition of the two distances is _____ km _____ m _____ cm _____ mm

	Kilometer	Meter			Centimeter		Millimeter	
	6	3	7	9	5	6	2	3
-	1	3	2	0	3	1	3	4

The difference between the two distances is _____ km _____ m _____ cm _____ mm



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 100 in exercise 2.

MASS



STUDENT LEARNING OUTCOMES

- Use standard metric units to measure the mass of different objects.

INFORMATION FOR TEACHERS

Teachers should be able:

1. Know the mass of light objects such as books, pencils, etc. can be measured in grams (g) and the mass of heavier objects such as the board, a school bag, etc. can be measured in kilograms (kg). The mass of objects like beads, jewels, medicine tablets, grains of wheat can be measured in milligrams (mg).
2. Be able to weigh different items in kilograms and grams.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Various items to weigh, weighing scale (for demonstration if possible)



INTRODUCTION

1. Place various objects of different masses on the table e.g. school bag, notebook, pencil case, books, sharpener, eraser, calculator, etc.
2. Call any student from the class and ask him/her to arrange the items one by one in order, from lightest to heaviest. The student should go with their approximation of the mass of the items. Other students should also share their opinion about which item could be light and which item could be heavy.
3. Tell students that they will be learning about the units used to measure the mass of various objects i.e. milligrams, grams and kilograms.
4. Tell students that milligrams are used for measuring very small objects (medicines, grain of wheat, etc.), light objects such as books, pencils, etc. can be measured in grams (g) and the mass of heavier objects such as the board, a school bag, etc. can be measured in kilograms (kg).



DEVELOPMENT

Activity 1:

1. Distribute empty packs of different objects like medicines, chocolate, biscuits, sugar, etc.) among the students. Make sure that the weight/mass is written on the packaging.
2. Ask students to note the mass written on these packs.
3. Now ask students to raise their hand and name the item followed by its mass.

4. Write the mass of each object on the board

E.g. mass written on medicines box = 250mg

mass written on biscuits = 350g

mass written on sugar pack = 5 kg

5. Tell the student that the lightest objects have their mass in mg, light objects have their mass in grams and heavier objects have their mass in kgs.

Activity 2:

1. Draw the following chart on the writing board and ask students to check/tick the correct unit of mass for the given objects:

#	Object	Milligram	Gram	Kilogram
1	Pen Cap			
2	Sack of Wheat			
3	Coin			
4	Pencil			
5	Dog			



CONCLUSION / SUM UP:

Tell the students that the mass of heavy objects is usually measured in kilograms, the mass of light objects is measured in grams, and the mass of even lighter objects is measured in milligrams.



ASSESSMENT

1. Ask the following questions from the students:

a. Which unit should be used to measure the mass of a goat?

b. Which unit should be used to measure the mass of a medicine tablet?



HOMEWORK / FOLLOW UP:

Students should guess the mass of different objects and then check their wrappers/packing for the actual weight.

CONVERSION OF MASS



STUDENT LEARNING OUTCOMES

- Convert larger to smaller metric units (2-digit numbers with one decimal place).
 - ✧ Kilograms into grams
 - ✧ Grams into milligrams

INFORMATION FOR TEACHERS

Teachers should know:

1. The relationship among kilograms, grams and milligrams i.e.
 - ✧ $1 \text{ kg} = 1000 \text{ g}$
 - ✧ $1 \text{ g} = 1000 \text{ mg}$
2. That heavy objects may be measured in kg and lighter objects may be measured in grams and milligrams.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Textbook, Notebook/Copy, Weights, Weighing Scale/Beam balance.



INTRODUCTION

1. Hold up the beam balance and ask students what it is used for.
2. Guide students to arrive at the right answer i.e. it is used for measuring the mass of various objects.
3. Ask a student to measure the mass of several textbooks (ensure that the mass is above 1 kg).
4. Assist the student in balancing the scales.
5. Say the mass is 3 kg 250 grams.
6. Write on the board 3kg and 250 grams
7. Asks how can we write the mass of the books in grams only i.e. How can we convert 3 kg into grams? (hint: $1 \text{ kg} = 1000 \text{ grams}$).
8. Ask students to raise their hands and give their answers. Tell students that we multiply 3 with 1000 to covert 3 kg to 3000 grams.
9. Guide students to arrive at the right answer of 3000 grams and then to add 250 grams to give the mass of the books as 3250 grams.
10. Repeat the process for another set of books or objects.



DEVELOPMENT

Activity 1:

1. Ask students to copy and answer the following questions in their notebooks:
 - ✧ The mass of a jug is 215 grams. What is the mass of the jug in milligrams? (hint: multiply 215 with 1000)
 - ✧ The mass of a student chair is 4 kg and 475 grams. What is the weight of the chair in grams? (hint: multiply 4 with 1000 and then add 475)

Activity 2:

1. Ask the students to copy and complete the table given below:

#	Mass	Convert to
i	5 kg 132 g	Grams = 5132 g
ii	9 kg 487 g	Grams =
iii	137 g 412 mg	Milligrams =



CONCLUSION / SUM UP:

1. Ask students to summarize the steps involved in converting:
 - ✧ kg to g
 - ✧ g to mg



ASSESSMENT

1. Ask students to attempt the following questions in their notebooks:
 - a. Convert 5 kg 256 g to g
 - b. Convert 13g 758 mg to mg
2. Write the answer on the board after all students have attempted the question.



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 105 in exercise 1.

ADDITION AND SUBTRACTION OF MASS



STUDENT LEARNING OUTCOMES

- Add and subtract measure of mass in same units.

INFORMATION FOR TEACHERS

Teacher should be able to:

1. Convert kilograms into grams and grams into milligrams i.e.
 - ✧ $1 \text{ kg} = 1000 \text{ g}$
 - ✧ $1 \text{ g} = 1000 \text{ mg}$
2. Align like terms with like terms and add measures of mass in the same unit.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Textbook, Notebook/Copy, Weights, Chart, Weighing Scale / Beam balance.



INTRODUCTION

1. Bring everyday items like toys and fruits to the class.
2. Place them on the table next to a weighing scale / machine.
3. Ask a few students to use the weighing scale to measure the mass of two objects separately.
4. All students should note the two masses in their notebooks.
5. Ask students to add up the masses of these two objects.
6. The teacher should now measure the mass of both objects together using balance machine to verify the addition done by students.



DEVELOPMENT

Activity 1:

1. Tell students that the mass of Ali's bag = 4kg 650g and the mass of Kamran's bag = 8kg 750g
2. Ask students to find the total mass of bags.
3. Tell them to use the table shown below:

Kilograms		Grams		
	1	1		
	4	6	5	0
+	8	7	5	0
	1	3	4	0

Activity 2:

1. Complete the table with help of the students:

#	Object 1	Object 2	Sum (Addition)	Difference (Subtraction)
1	5 Kg	3 kg		
2	200 g	600g		
3	5 kg	4kg		
4	500g	20g		
5	2 kg 700g	3kg 100g		
6	5kg 600g	1kg 20g		



CONCLUSION / SUM UP:

Ask students to list the steps in the addition and subtraction of different masses having the same unit of measurement i.e. kg and g. Students should highlight the importance of aligning like terms with like terms and then adding measures of mass in the same unit.



ASSESSMENT

1. Paste the chart shown below on the board. This chart should be prepared prior to the lesson.
2. Ask students to work in pairs.
3. Copy and complete the table.
4. Write the answer on the board after all students have attempted the questions.

#	Object 1	Object 2	Sum (Addition)	Difference (Subtraction)
1	6 kg	4 kg		
2	700 g	300g		
3	3 kg	2kg		
4	500g	300g		
5	8 kg 700g	5kg		
6	9kg 700g	5kg 600g		



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 105 in exercise 1.

CAPACITY



STUDENT LEARNING OUTCOMES

1. Use standard metric units to measure the capacity of different containers.
2. Convert larger to smaller metric units (2-digit numbers with one decimal place) liters into milliliters

INFORMATION FOR TEACHERS

Teachers should be able:

1. To measure the capacity of different objects in liters and milliliters.
2. To understand that milliliters are used to measure the capacity of small containers such as glasses, cups, etc. and liters may be used to measure the capacity of large containers like tubs, tankers, etc.
3. To convert liters into milliliters i.e.
 - ✧ 1 liter = 1000 milliliters



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Chalk, Marker, Textbook, Notebook, Flashcards, Jug with Capacity of 1 liter, 4 glasses that hold 250 milliliters



INTRODUCTION

1. Show the empty jug to the students and ask if they know the capacity of the jug?
2. Fill the 1-liter jug with water and ask students how much water does it have? (avoid using the word volume).
3. Give students a few minutes to discuss in pairs and share their responses.
4. Tell students that if the capacity of the jug is 1 liter, then the water in the jug should also be 1 liter. Introduce the idea to students that 1 liter is equal to 1000 milliliters.
5. Pour 1000 milliliters of liquid equally in 4 glasses.
6. Ask the students how much water is in each glass?
7. Give students a few minutes to discuss and then take their responses.
8. Guide students to arrive at the correct answer of 250 milliliters.
9. Guide students to make the connection $1 \text{ liter} = 1000 \text{ milliliters} = 250 \text{ ml} + 250 \text{ ml} + 250 \text{ ml} + 250 \text{ ml}$
10. Tell the students that large quantities are measured in liters while small quantities are measured in milliliters.



DEVELOPMENT

Activity 1:

1. Ask students to copy and answer the following questions in their notebooks:
 - ✧ Amjad filled 13 liters of petrol in his car. How much would this be in milliliters?
 - ✧ Scientists say that there are almost 41 liters of water in the human body. How many milliliters of water are there in the human body?

Activity 2:

1. Ask the students to work in pairs.
2. Copy and complete the following table in their notebooks:

	Capacity in Liters and Milliliters	Capacity in Milliliters
i	9 liters 365 milliliters	$9 \times 1000 = 9000$ So, $9000 + 365 = 9365$ milliliters
ii	17 liters 242 milliliters	
iii	42 liters 34 milliliters	
iv	1 liter 500 milliliters	

3. Write the answer on the board after all students have attempted the questions.



CONCLUSION / SUM UP:

Ask students how we measure the capacity of different containers. Students should mention that for different containers we use different units of capacity i.e., milliliters are used to measure the capacity of small containers such as glasses, cups, etc. and liters may be used to measure the capacity of large containers like tubs, tankers, etc.



ASSESSMENT

1. In your notebooks, convert:
 1. 12 liters 345 milliliters to milliliters
 2. 4 liters 123 ml to milliliters
 3. 25 liters 800 milliliters to millimeters
2. Write the answer on the board after all students have attempted the questions.



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 108 in exercise 4.

Month

7

ADDITION AND SUBTRACTION OF CAPACITY



STUDENT LEARNING OUTCOMES

- Add and subtract measures of capacity in the same units.

INFORMATION FOR TEACHERS

Teachers should be able:

1. To convert liters to milliliters (1 liter = 1000 milliliters)
2. To align like terms with like terms and add/subtract measures of capacity in the same unit.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Chalk, Marker, Textbook, Notebook, Chart



INTRODUCTION

1. Write the following word problem, based on a real-life situation, on the board.
Minahil drinks 1 liter 425 ml in the first half of the day and 1 liter 417 ml in the second half.
How much water did she drink?
2. Ask students to work in pairs and attempt the questions. Give students a few minutes to attempt the question and record their responses.
3. Tell students that in order to answer the question, make the table as shown below and enter the numbers under the correct headings.
4. Students should carry out the addition.

	Liter	Milliliter		
		1		
	1	4	2	5
+	1	4	1	7
	2	8	4	2

5. After aligning and adding, show students that Minahil drank 2 liters and 842 ml that day.



DEVELOPMENT

Activity 1:

1. Ask students to work in groups of 3.
2. Copy and answer the following questions in their notebooks:

- ✧ Aslam has a car that has a fuel tank capacity of 50 liters. On an empty tank, he fills 19 liters of petrol. How much more fuel can still be added to the tank?
- ✧ Sana has two containers. The capacity of one container is 43 liters 247 milliliters and the capacity of the other is 22 liters 133 milliliters.
 - What is the total capacity of the containers?
 - What is the difference in the capacity of both containers?
- ✧ Sarah is making *iftar* for her family. She uses 125 ml of oil to make *pakor*as and another 77 ml to bake a cake. How much oil did Sarah use in total?

3. Write the correct answer on the board after all groups have attempted the questions.

Activity 2:

1. Draw the following table or paste the chart on the board. The chart should be prepared prior to the lesson.
2. Ask the students to individually copy and complete the following table in their notebooks:

	Capacity 1	Capacity 2	Sum (Addition)	Difference (Subtraction)
i	77 liters 890 milliliters	15 liters 582 milliliters		
ii	2.7 milliliters	0.6 milliliters		

	Capacity 1	Capacity 2	Sum (Addition)	Difference (Subtraction)
i	7 liters 234 milliliters	5 liters 100 milliliters		
ii	87 liters 530 milliliters	34 liters 322 milliliters		

3. Write the answer on the board after all students have attempted the questions.



CONCLUSION / SUM UP:

Ask the students to summarize all the steps involved in adding and subtracting the measurement of capacity in the same unit. Students should mention that it is important to align liters with liters and milliliters with milliliters as shown in the table above.



ASSESSMENT

Ask the students to answer the following questions in their notebooks and then fill in the blanks.

	Liter	Milliliter		
	16	4	4	4
+	09	1	2	7

The addition of the two capacities is ____ liters ____ milliliters

	Liter	Milliliter		
	99	7	8	6
-	31	3	2	1

The difference between the two capacities is _____ liters_____ milliliters



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 110 in exercise 5.

REAL LIFE SITUATIONS IN MEASUREMENTS



STUDENT LEARNING OUTCOMES

- Solve real-life situations involving conversion, addition, and subtraction of measures of length, mass, and capacity.

INFORMATION FOR TEACHERS

Teachers should know how to convert:

- kilometers, meters, centimeters, and millimeters using
 - ✧ $1 \text{ km} = 1000 \text{ m}$
 - ✧ $1 \text{ m} = 100 \text{ cm}$
 - ✧ $1 \text{ cm} = 10 \text{ mm}$
- kilograms, grams, and milligrams using
 - ✧ $1 \text{ kg} = 1000 \text{ g}$
 - ✧ $1 \text{ g} = 1000 \text{ mg}$
- liters and milliliters using
 - ✧ $1 \text{ liter} = 1000 \text{ milliliters}$



DURATION / NO OF PERIODS: 2 LESSONS / 35 + 35 MINUTES.



MATERIALS / RESOURCES REQUIRED

- Board, Chalk, Marker, Textbook, Notebook.
- Students should come to this lesson with their height (in meters and centimeters) and mass (in kilograms and grams) recorded.



INTRODUCTION

- Tell students to raise their hands if they know the answers to the following questions:
- The teacher calls upon different students to answer and record their input.

How would you **measure** the **length** of the board? What would be the length of the board in class? What other units are used for measuring the length? Guide students to the correct answer; kilometers, meters, centimeters, and millimeters.

How would you **measure** the **mass** of an object? What would be the mass of a chair in a class? What are some other units used for measuring the mass of an object? Guide students to the correct answer; kilograms, grams, and milligrams.

How would you **measure** the **capacity** of an object? What would be the capacity of a bucket or a bottle of water? What other units can be used for measuring the capacity of an object? Guide students to the correct answer; liters and milliliters.



DEVELOPMENT

Activity 1:

- Write the following question on the board and explain it to the students:
The height of a mountain in Africa is 5 km and 895 m, whereas that of another mountain in Japan is 3 km and 776 m.
 - What is the difference between the height of the two mountains? Give your answers in meters.
 - What is the total height of the mountains? Give your answers in meters.
- Ask the students to work in pairs and attempt the question in their notebooks.
- Now ask a student to solve the first part on the board and guide that student to arrive at the correct answer. To find the difference, make the table like the one shown below:

	Kilometer	Meter		
		8	1	
	5	8	8	5
-	3	7	7	6
	2	1	1	9

As per the table above the difference in height between the mountain in Africa and the mountain in Japan is 2 km and 119 m.

2 km can be represented in meters as $2 \times 1000 = 2000$ m

Therefore the total difference in height is 2119 meters.

- Now ask a student to solve the second part on the board and guide that student to arrive at the correct answer. To find the sum, make the table like the one shown below but this time add the heights:

	Kilometer	Meter		
	1	1	1	
	5	8	9	5
+	3	7	7	6
	9	6	7	1

As per the table above the total heights of both mountains are 9 km and 671 m.

9 km can be represented in meters as $9 \times 1000 = 9000$ m

Therefore the total of heights is 9671 meters.



CONCLUSION / SUM UP

- Ask students what are some things to look out for when solving real-life situations involving conversion, addition, and subtraction of measures of length.
- Students should mention the importance of aligning like terms with like terms and then adding and subtracting lengths in the same unit.

REAL LIFE SITUATIONS IN MEASUREMENTS



INTRODUCTION

1. Tell students that in the previous lesson we added and subtracted measures of length.
2. In this lesson we will so some questions on mass and on capacity as well.



DEVELOPMENT

Activity 2:

1. Ask students to work in pairs.
2. Write the following questions on the board and explain them to the students:
 - ✧ Abid's mass is 83 kg 272 g and Hassan's mass is 92 kg and 176 g. What is the total of their masses? How much more is Hassan's mass compared to Abid's mass? Give both your answers in grams.
 - ✧ In a village with a water shortage, a sister and a brother carry water in separate buckets from a nearby water well. The capacity of the brother's bucket is 12 liters 275 ml and the capacity of the sister's bucket is 7 liters 500 ml. What is the total amount of water that they carry? How much more water does the brother carry as compared to the sister? Give both your answers in milligrams.
 - ✧ Azam Ali travels a distance of 526 km 375 m from Lahore to Peshawar. On the way back from Peshawar to Lahore, he takes a different route and travels 511 km 238 m. What is the total distance traveled by Azam? How much shorter was the route on his journey back to Lahore? Give both your answers in meters.
3. Ask the pairs to solve the question in their notebooks.
4. Now ask voluntarily to solve the first question on the board and guide all students on how to arrive at the correct answer.
5. Follow the same steps for other questions.



CONCLUSION / SUM UP:

Ask students to list all the steps involved in adding and subtracting measures of length, mass, and capacity in the same unit. Students should highlight that it is important to align like units with like units and to be careful as to which operation to use i.e. + or -. Students should also mention the conversion of lengths, mass and capacities as outlined in the **Information for teachers** section.



ASSESSMENT

1. Ask students to work in pairs.
2. Each pair fills in the following table and submits it to the teacher for marking.

	Student 1	Student 2	Total (Sum)	Difference
--	-----------	-----------	-------------	------------

Mass				
Height				

3. Encourage students to write the total and difference of mass in grams.
4. Encourage students to write the total and difference of height in centimeters.



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 111–112 in the review exercise.

READING AND WRITING TIME



STUDENT LEARNING OUTCOMES

- Read and write the time using digital and analogue clocks in 12-hour and 24-hour format.

INFORMATION FOR TEACHERS

Teachers should be able:

- Be able to tell the time in a 12-hour and 24-hour format on both digital and analogue clocks.
- Understand that when the 'minute hand' completes a rotation, one hour passes. When the 'second hand' completes one rotation, one minute passes.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



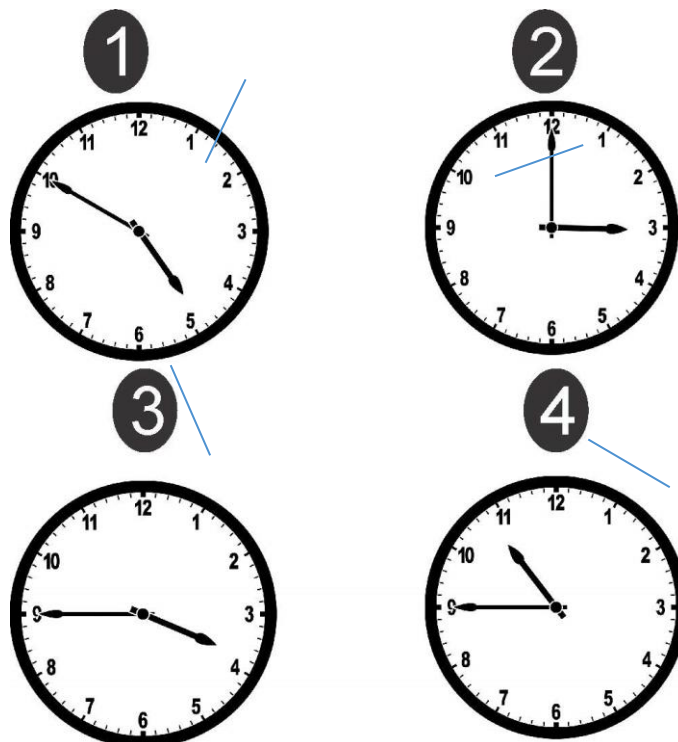
MATERIALS / RESOURCES REQUIRED

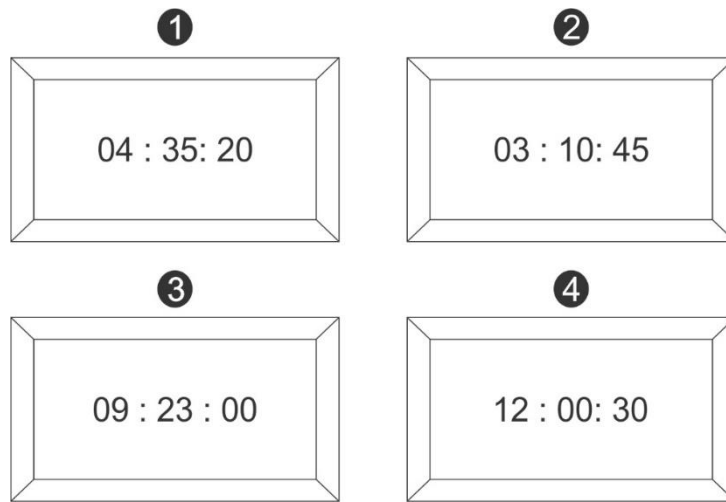
Board, Marker, Notebooks, Textbooks, Pencils, Worksheet, Wall Clock



INTRODUCTION

- Prepare two illustrations; one of an analogue clock and the other of a digital clock.
- The teacher should draw these on the board before the lesson.





3. Post the pictures of the analogue clocks on the board and ask students to identify the type of clock. After taking a few responses, tell the students the correct answer i.e. analogue clock.
4. Now paste the pictures of the digital clocks on the board and ask students to identify the type of clock. After taking a few responses, tell the students the correct answer i.e. digital clock.
5. Tell students that the long hand is for minutes and the short hand is for hours. The other long hand (shown in blue) is for seconds.
6. Ask students where the hour hand is?
7. Students should say between 4 and 5.
8. The teacher should tell students, that since the hour hand is between 4 and 5, we can say that it is 4 o'clock and some minutes. It is not 5 o'clock yet as the hour hand is still **before** 5.
9. Next, the teacher should ask the students where is the minute hand? How many minutes have passed since 4 o'clock? Give students a few minutes to think and answer.
10. Remind students that each digit on the clock face represents 5 mins for the minute hand i.e., the digit 1 represents the passing of 5 mins, the digit 2 represents the passing of 10 mins and so on.
11. Tell students that if the minute hand is at 10, that means that 50 mins have elapsed after the hour. The teacher should count up in 5s and hold up one finger for each consecutive multiple of 5. When the teacher is holding up 10 fingers the count should be 50.
12. Lastly, ask students how many seconds have passed? Give students a minute to observe and answer.
13. Remind students that the small markings on the clock face represents 1 second for every marking for the second hand.
14. Students should look carefully at the analogue clock and say that 4 seconds have passed.
15. Therefore, the time shown in analogue clock # 1 is 4:50:04.
16. Tell students that in today's lesson we will learn to read the time on both, analogue and digital clocks.
17. The teacher should refer to page 115 and 116 and explain the reading of time on digital clocks to students.
18. Highlight how some digital clocks will say "p.m." and others will show time in 24-hour formats.



DEVELOPMENT

Activity 1:

1. The teacher will ask the students to read the time on both the analogue and the digital

clocks shown on the board one by one.

2. The teacher demonstrate to the students with an actual analogue clock what the hour hand, the minute hand, and the second hand represent.
3. The teacher should ask students to show, on the analogue clock, the time displayed on the digital clocks on the chart.
4. Ensure that all students participate in the exercise.
5. The correct answers for the analogue clocks are 1) 4:50:04, 2) 3:00:42, 3) 3:45:51, 4) 10:45:20.
6. Tell students that it is not possible to tell A.M or P.M on an analogue clock
7. The correct answers for the digital clocks are 1) 04:35:20 a.m., 2) 03:10:45 a.m., 3) 09:23:00 a.m., 4) 12:00:30 p.m.
8. Tell students that it is possible to tell A.M or P.M on a digital clock.

Activity 2:

1. Set a time on the wall clock and then show it to the students.
2. Ask students to raise their hands if they know what the correct time is.
3. For the students that do not know, guide them on how to tell the time.
4. Repeat this by setting different times on the clock and record the students' responses.
5. Students should record the different times with a drawing of the wall clock for each time.



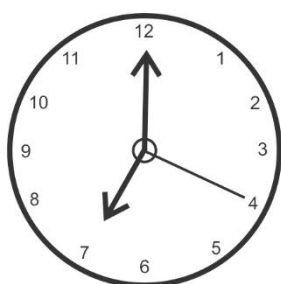
CONCLUSION / SUM UP:

Ask students to list the key features of analogue and digital clocks and how we can read the time in both.

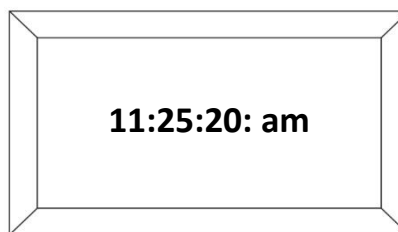


ASSESSMENT

1. Draw the following figures on the writing board.
2. In their notebooks, students should write the time for both the analogue and the digital clock in the blank space provided.



Fill in the blanks



Fill in the blanks



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 117 in exercise 1.

CONVERSION OF TIME



STUDENT LEARNING OUTCOMES

- Convert hours to minutes and minutes to seconds.

INFORMATION FOR TEACHERS

Teachers should be able:

1. Know that
 - ✧ 1 minute = 60 seconds
 - ✧ 1 hour = 60 minutes
2. Be able to convert hours to minutes and minutes to seconds.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



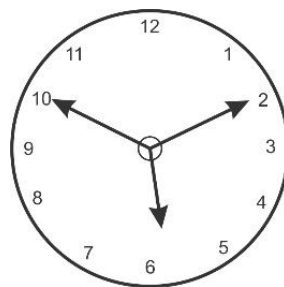
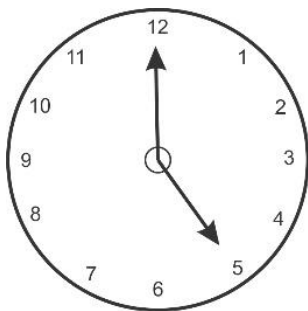
MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Worksheet, Wall clock



INTRODUCTION

1. Remind students that in an analogue clock, the short hand represents hours, the long hand represents minutes, and the longest/thin hand represents seconds.
2. Tell the students that when second hand completes 1 rotation, one-minute passes as 1 minute = 60 seconds.
3. Tell the students that when the minute hand completes 1 rotation one-hour passes as 1 hour = 60 minutes.
4. By raising their hands, students should tell the correct time in the clock below: (Correct Answer: 5:50:10)





DEVELOPMENT

Activity 1:

1. Draw the analogue clock shown above on the writing board.
2. Ask students to look carefully at the clock and tell the correct time.
3. Encourage students to raise their hands. (Correct answer: 5:00:00).
4. Ask students if they can differentiate between a.m. and p.m.?
5. Tell students to discuss in pairs for a few minutes and share their input.
6. Tell students that a.m. is used when the time is after midnight to just before 12 noon (middle of the day) and p.m. is used when the time is from 12 noon to just before midnight.
7. Tell the students that even though it is not possible to tell whether an analogue clock is showing a.m. or p.m., the time shown in the clock drawn on the board is 5 p.m. exactly.
8. Ask students how many hours have passed since 12 noon?
9. Let students discuss before telling them the correct answer: 5 hours.
10. Now ask students how many minutes have passed since 12 noon or how many minutes are in 5 hours?
11. Give students a few minutes to think in pairs and to discuss.
12. Let students share their input on how many minutes have elapsed. The teacher should prompt thinking by asking students how many minutes are in 1 hour? How many minutes will there be in 5 hours?
13. Facilitate students in arriving at the correct answer i.e., 5 hours x 60 minutes = 300 minutes.
14. Now ask students how many seconds are there in 300 minutes.
15. Give students a few minutes to think in pairs and to discuss. Let students share their input on how many seconds have elapsed. The teacher should prompt thinking by asking students how many seconds are in 1 minute? How many seconds will there be in 300 minutes?
16. Facilitate students in arriving at the correct answer 300 minutes x 60 seconds = 18000 seconds
17. Summarize the activity by concluding that there are 300 minutes or 18000 seconds in 5 hours.

Activity 2:

1. Ask the students to work in pairs.
2. Draw the table shown below on the writing board.
3. Ask students to copy and complete the table shown below in their notebooks.
4. Ask a few students to voluntarily to solve the first two questions on the board. Guide students thorough the solution.
5. Write the correct answers in all the spaces after students have attempted the questions.

Convert hour to minutes and minutes to seconds.

#	Hours Mins and Secs	Minutes	Seconds
1	2 hours 0 mins 0 secs	120	7200
2	5 hours 30 mins	330	19800
3	6 hours 20 mins 45secs		
4	3 hours 30 secs		
5	1 hour 25 mins 59 secs		



CONCLUSION / SUM UP:

Ask students to list down all the steps involved in the conversion of hours to minutes and minutes to seconds.



ASSESSMENT

Fill in the blanks.

1. 4 hours = _____ minutes
2. 18 minutes = _____ seconds
3. 16 hours 44 mins = _____ seconds
4. 9 minutes = _____ seconds



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 121 in exercise 2.

READING AND WRITING TIME



STUDENT LEARNING OUTCOMES

- Convert years to months, months to days, and weeks to days.

INFORMATION FOR TEACHERS

1. Teachers should know that:
 - ✧ 1 year = 12 months
 - ✧ 1 month = 30 days
 - ✧ 1 week = 7 days
2. Teachers should be able to convert years to months, months to days, and weeks to days.



DURATION / NO OF PERIODS: 2 LESSONS / 35 + 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Worksheet, Calendars



INTRODUCTION

1. The teacher will ask the students for their birthday **months**.
2. Tell students “raise your hand if you were born in January?”
3. Repeat the same question for all months. Note each month on the board. Ensure that each month is numbered from 1 to 12.
4. Tell students that there are 12 months in one year or 12 months make up 1 complete year.
5. Now tell students to imagine that it’s their birthday today.
6. Ask students what will happen if **7 days** pass? Guide students to the correct answer: You will be **1 week** older. Tell students that 1 week equals 7 days.
7. Now ask students what will happen if 30 days pass? Guide students to the correct answer: You will be **1 month** older. Tell students that 1 month equals 30 days. Do not go into the details that some months have 31 days and some months have 30 days (or February has 28 days).
8. Finally ask students what will happen if 12 months pass? Guide students to the correct answer: You will be **1 year** older. Tell students that 12 months equal 1 year.



DEVELOPMENT

Activity 1:

1. Divide the class into small groups.

2. Distribute a calendar to each group and ask students to make as many observations as possible.
3. Students should record their observations in their notebooks.
4. Ask the following questions after students have recorded their observations:
 - ✧ How many months are there in one year?
 - ✧ How many days in one month? Let students comment on the different number of days in different months.
 - ✧ How many days are there from Sunday to Saturday or in one week?
 - ✧ Extra credit: How many days in one year?

Activity 2:

1. Ask the students to work in pairs.
2. Copy and complete the following table in their notebooks.
3. The teacher should solve the first question on the board for the students and guide them through each step.
4. For Q 1, tell students that there are 12 months in 1 year. Therefore, in 5 years there will be $5 \times 12 = 60$ months. Then add the 9 months to the 60 to get a total of 69 months.

#	Years and Months	Months
1	5 Years and 9 Months	$5 \times 12 = 60$ months $60 + 9 = 69$ months
2	6 Years and 7 Months	
3	2 Years and 8 Months	
4	4 Years and 2 Months	
5	6 Years and 11 Months	



CONCLUSION / SUM UP

1. Ask students to summarize the key takeaways in the conversion of years to months.
2. Tell students to copy any unfinished questions in their notebooks and individually complete all the questions and bring them to the next lesson.

CONVERSION OF TIME



INTRODUCTION

1. Ask students to voluntarily and come up to the writing board and solve each question. Ask other students to also give their input.
2. Share the correct answers with the students by solving the problems on the writing board.
3. Tell students that in the previous lesson we did some questions on converting years to months. In today's lesson we will solve some questions on the conversion of months to days and weeks to days.



DEVELOPMENT

Activity 3:

1. Ask the students to work in pairs.
2. Copy and complete the following table in their notebooks.
3. The teacher should solve the first question on the board for the students and guide them through each step.
4. For Q 1, tell students that there are 30 days in a month. Therefore, in 8 months there will be $8 \times 30 = 240$ days. Then add the 47 days to the 240 to get a total of 257 days.

#	Months and Days	Days
1	8 Months and 57 Days	$8 \times 30 = 240$ days $240 + 57 = 297$ days
2	4 Months and 22 Days	
3	2 Months and 11 Days	
4	11 Months and 2 Days	
5	6 Months	

Activity 4:

1. Ask the students to work in pairs.
2. Copy and complete the following table in their notebooks.
3. The teacher should solve the first question on the board for the students and guide them through each step.
4. For Q 1, tell students that there are 7 days in a week. Therefore, in 4 weeks there will be $4 \times 7 = 28$ days. Then add the 5 days to the 28 to get a total of 33 days.

#	Weeks and Days	Days
---	----------------	------

1	4 Weeks and 5 Days	$4 \times 7 = 28$ days $28 + 5 = 33$ days
2	8 Weeks and 2 Days	
3	12 Weeks and 1 Day	
4	16 Weeks and 2 Days	
5	3 Weeks and 6 Days	



CONCLUSION / SUM UP:

Ask students to summarize the key takeaways in the conversion of years to months, months to days, and weeks to days. Students should highlight that:

1 year = 12 months

1 month = 30 days

1 week = 7 days



ASSESSMENT

Ask students to work in small groups and fill in the blanks:

- 2 Years and 14 Months = _____ Months
- 6 Years = _____ Months
- 11 Months and 14 Days = _____ days
- 9 Months and 11 Days = _____ days
- 3 weeks = _____ days
- 1 week and 4 Days = _____ days



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 123-124 in exercise 3.

ADDITION AND SUBTRACTION OF TIME



STUDENT LEARNING OUTCOMES

- Add and subtract measures of time without carrying and borrowing.

INFORMATION FOR TEACHERS

Teachers should understand that:

1. To add and subtract measures of time they should always start from the smaller units.
2. In the addition and subtraction of time, we add/subtract hours to hours, minutes to minutes, and seconds to seconds.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Worksheet



INTRODUCTION

1. Write the following question on the board and explain it to the students:
 - ✧ Alina travels from Peshawar to Islamabad in 2 hours and 15 minutes. She then travels from Islamabad to Lahore in 4 hours and 40 minutes.
 - ✧ Find the total time she took to travel from Peshawar to Lahore.
2. Ask students to work in pairs and attempt the question.
3. Give students a few minutes and then take their responses.
4. Show students how to add up units of time as shown below:

	Hours	Minutes
Peshawar to Islamabad	2	15
Islamabad to Lahore	+	40
Total Time Travelled	6	55

5. Ask students how much longer it took her to travel from Islamabad to Lahore than to travel from Peshawar to Islamabad.
6. Ask students to work in pairs and attempt the second question.
7. Give students a few minutes and then take their responses.
8. Show students how to subtract units of time as shown below:

	Hours	Minutes
Islamabad to Lahore	4	40
Peshawar to Islamabad	- 2	15
Difference in Time Travelled	2	25

9. Tell students that in today's lesson they will learn about adding and subtracting measures of time.



DEVELOPMENT

Activity 1:

- Ask the students to work in pairs.
- Copy and complete the following table in their notebooks.
- Solve questions 1 and 5 on the board for students to understand how to calculate the sum and difference involving hours, minutes, and seconds.

#	Time 1	Time 2	Sum	Difference
1	5 hrs 35 mins	2 hrs 23 mins	$35 + 23 = 58$ mins $5 + 2 = 7$ hrs 7 hrs 58 mins	$35 - 23 = 12$ mins $5 - 2 = 3$ hrs 3 hrs 12 mins
2	12 hrs 47 mins	5 hrs 12 mins		
3	9 hrs 36 mins	6 hrs 14 mins		
4	6 hrs 50 mins	5 hrs 8 mins		
5	17 hrs 26 mins 45 secs	9 hrs 22 mins 13 secs	$17 + 9 = 26$ hrs $26 + 22 = 48$ mins $45 + 13 = 58$ secs 26 hrs 48 mins 58 secs	$17 - 9 = 8$ hrs $26 - 22 = 4$ mins $45 - 13 = 32$ secs 8 hrs 4 mins 32 secs
6	4 hrs 11 mins 33 secs	1 hr 10 mins 11 secs		
7	18 hrs 38 mins 57 secs	1 hr 1 min 1 sec		
8	12 hrs 27 mins 44 secs	11 hrs 12 mins 10 secs		

- After students have attempted all questions in pairs, enter the solutions to all parts.
- Tell students to make corrections on their attempts.



CONCLUSION / SUM UP:

Summarize that in the addition and subtraction of units of time, we always start with the smallest unit i.e., we add/subtract seconds with seconds, minutes with minutes, and hours with hours.



ASSESSMENT

- Write the following questions on the board and ask the students to solve them in their notebooks. Ask students to carefully observe the sign next to each question.

2. Give students feedback.

1)	Hours	Mins	Secs
	2	10	30
+	3	20	10
<hr/>			

2)	Hours	Mins	Secs
	1	20	20
+	4	20	25
<hr/>			

3)	Hours	Mins	Secs
	5	41	12
-	4	11	5
<hr/>			

4)	Hours	Mins	Secs
	9	35	45
-	4	32	31
<hr/>			



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 126 in exercise 4.

REAL-LIFE SITUATIONS – TIME**STUDENT LEARNING OUTCOMES**

- Solve simple real-life situations involving conversion, addition, and subtraction of measures of time.

INFORMATION FOR TEACHERS

Teachers should be able:

1. Be able to convert hours to minutes and minutes to seconds.
2. Be able to convert years to months, months to days, and weeks to days
3. Know that the conversion, addition, and subtraction of measures of time is an important aspect of everyday life.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES

**MATERIALS / RESOURCES REQUIRED**

- Board, Marker, Notebooks, Textbooks, Pencils, Flashcards

**INTRODUCTION**

1. Write the given real-life situation on board.
"Ali completes his English homework in 1 hour and 17 minutes and completes his Math homework in 2 hours and 33 minutes".
2. Ask students, how much total time was spent on homework in hours and minutes? Give students a few moments to think and discuss.
3. Guide students to the correct answer of 3 hrs and 50 mins.
4. Ask students to find the total time in minutes. Guide them through the steps.
5. As $3 \times 60 = 180$. Therefore, $180 + 50 = 230$ minutes.
6. Ask students to find the difference between the time spent on the homework in hours and minutes.
7. Guide them to arrive at the correct answer.

	Hours	Minutes
	2	33
-	1	17
	1	16

8. As $1 \times 60 = 60$ mins. Therefore, $60 + 16 = 76$ minutes.

9. Tell students that today we will be learning about conversion, addition, and subtraction of time in real-life situations.



DEVELOPMENT

Activity 1:

1. Divide the class into 5 groups.
2. Give each group one flashcard to solve in their notebooks.
3. After a designated time, each group passes on their flashcard to the next group.
4. By the end of the allotted time, each group should have completed all 5 questions.
 - ✧ A professional squash player trains with coach Jehansher for 1 year and 7 months and then trains with coach Jehangir for 3 years and 11 months. How long did the squash player take coaching altogether (addition)? How much longer does the player train with coach Jehangir than coach Jehansher (subtraction)? Write your answers in months.
 - ✧ Minahil travels from Peshawar to Swabi in 2 hours and 14 minutes in her car. On the way back (Swabi to Peshawar) she takes public transport, and the return journey takes her 4 hours and 35 minutes. How long was the total time spent on the road (addition)? How much longer did the return journey take (subtraction)? Write your answers in minutes.
 - ✧ Ahmad takes 2 hours 12 minutes to complete a Science assignment and 7 hours 44 minutes to complete an English assignment. How long does Ahmad take in completing both assignments (addition)? How much longer does the English assignment take (subtraction)? Write your answers in minutes.
 - ✧ Jamal's journey from Islamabad to Jeddah, Saudi Arabia took 5 hours and 20 minutes. Rabia's journey from Islamabad to Tehran, Iran takes 7 hours and 35 minutes. How much was the total time taken for both journeys (addition)? How much longer did Rabia's journey take compared to Jamal's journey (subtraction)? Write your answers in minutes.
 - ✧ Isha walked from her home to school in 1 hour and 23 minutes and her friend Lubna walked from her home to school in 17 minutes. How much total time were both friends walking for (addition)? How much longer did Isha's journey take compared to Lubna's journey (subtraction)? Write your answers in minutes.
5. The teacher should ask students to voluntarily and solve each question on the board.
6. Guide students to reach the correct answer.



CONCLUSION / SUM UP:

1. Ask students the importance of the conversion, addition, and subtraction of measures of time. Why is it an important aspect of everyday life?
2. Encourage students to give examples. By the end of the discussion students should recall:
 - a. How to convert hours to minutes and minutes to seconds.
 - b. How to convert years to months, months to days, and weeks to days



ASSESSMENT

1. Ask the students to copy and complete the following question in their notebooks:

2. Alamdar spends 2 hours 11 minutes at his grandmother's house and 4 hours 47 minutes at his cousin's house.
 - a. How long does Alamdar spend in total at his relatives' homes?
 - b. How much longer does Alamdar spend at his cousin's house than at his grandmother's house?
 - c. Carry out the conversion and write your answers in minutes.
3. Provide individual students guidance wherever needed.



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on pages 126-127 in exercise 4 and the review exercise.

LINES



STUDENT LEARNING OUTCOMES

- Recognize and identify parallel and non-parallel lines.

INFORMATION FOR TEACHERS

- Teachers should know the difference between horizontal and vertical lines as well as parallel and non-parallel lines.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



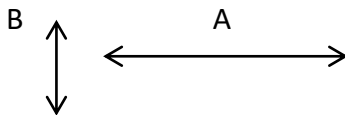
MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Rulers

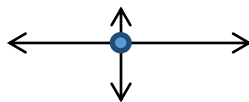


INTRODUCTION

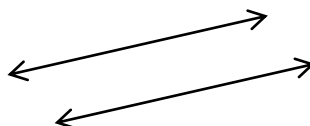
- Draw the following lines on the board:



- Ask the students to work in pairs
- Observe and tell the difference between the two lines. Students should share their answers by raising their hands. The teacher should record student responses.
- After student discussion tell students that the flat line, line A is a **horizontal** line and the upright line, line B is a **vertical** line.
- Draw two lines as shown below:



- Ask the students to observe the two lines and share their observations with the class.
- After discussion, tell the students that when two lines cut each other they are called intersecting lines or **non-parallel lines** and they have a point of intersection (blue dot).
- Lastly, draw two lines as shown below:



- Ask the students to work in pairs

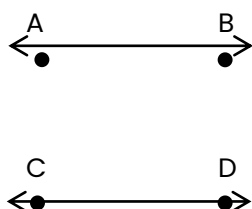
10. Share your observations on the two lines by raising their hands. The teacher should record student responses.
11. After discussion, tell students that when two lines do not intersect, they are called non-intersecting lines or **parallel lines**.
12. Extend the lines and show that they will not intersect at any point.
13. Tell the students that in today's lesson we will learn about the different types of lines.



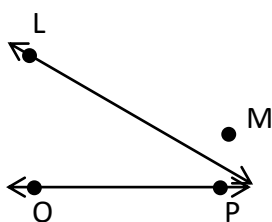
DEVELOPMENT

Activity 1:

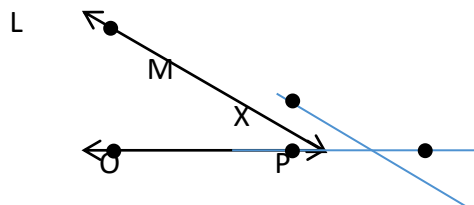
1. Draw the given lines AB and CD on the board:



2. Ask the students if the lines AB and CD meet at any point? Record student responses (they may raise their hands and answer).
3. Extend the lines and show students that they do not meet.
4. Ask the students "What do we call such lines which do not meet at any point?" Let students raise their hands and answer.
5. Write the correct answer on the board "Line AB and Line CD are parallel lines".
6. Ask students to copy the lines (AB and CD) and the above statement in their notebooks.
7. Now draw another pair of lines LM and OP on the board:



8. Ask students whether the lines LM and OP meet at any point? Give students a few moments to discuss and answer.
9. Tell students that they currently do not intersect but if we extend these lines then they will intersect.
10. Extend the lines so they look as shown below:

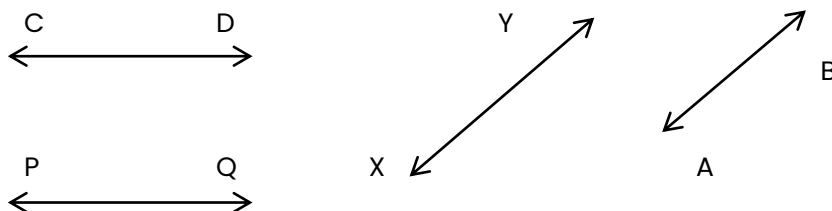


11. Ask the students where the lines LM and OP meet?
12. Let students discuss in pairs and share their responses.
13. Tell students that if the lines LM and OP are extended, they intersect at a point. Label it, X.

14. Write on the board "Line LM and Line OP are non-parallel lines".
15. Ask students to copy the lines (LM and OP) and statement in their notebooks.
16. Summarize that lines AB and CD didn't meet at any point, even after extension and the distance between them remained constant / the same. Ask students what type of lines they are. Expect that students will provide correct response but assist them to reach the correct response. Repeat that these type of lines are called **parallel lines**. Tell them we write this as $AB \parallel CD$.
17. In the case of line LM and OP, we observed that the pair of lines meet at point X after extension. Repeat, that such types of lines are called **nonparallel lines**.

Activity 2:

1. Draw the following lines on the board:



2. Tell students to identify and write which lines are parallels and which are not.
3. Write as many pairs of parallel lines and non-parallel lines as possible for e.g., CD is non-parallel to XY.



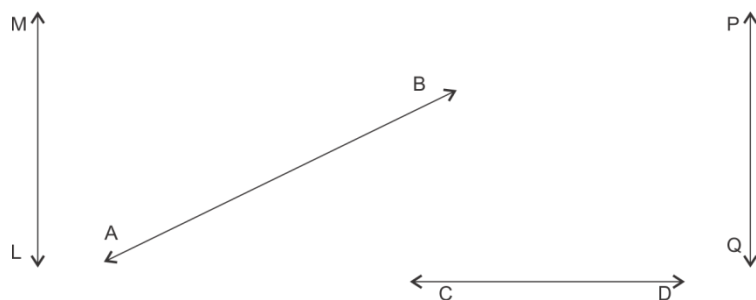
CONCLUSION / SUM UP:

Ask students to outline the key differences between horizontal and vertical lines as well as parallel and non-parallel lines.



ASSESSMENT

1. Draw the following lines on the board.



2. Ask students to fill in the given blanks with "parallel" or "non-parallel".

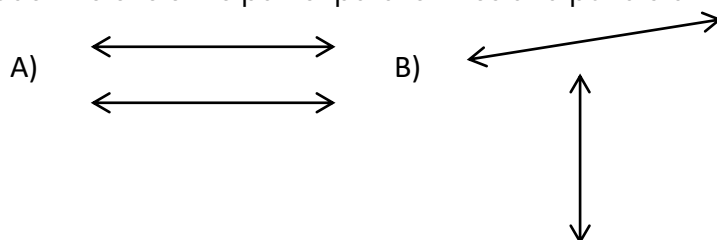
LM is _____ to AB

LM is _____ to PQ

CD is _____ to AB

AB is _____ to PQ

3. Ask the student to circle the pair of parallel lines and put a star next to the non-parallel lines.





HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 134 in exercise 1.

Month

8

ANGLES



STUDENT LEARNING OUTCOMES

- Recognize an angle formed by the intersection of two rays.
- Measure angle in degrees ($^{\circ}$) by using a protractor
- Draw an angle of a given measurement and use the symbol (\angle) to represent it.

INFORMATION FOR TEACHERS

Teachers should be able:

1. To understand that when two-nonparallel lines intersect each other at a point, different angles are formed at the common point.
2. To tell the difference between a line, a ray, and a line segment.
3. To know that the common endpoint of two or more rays or line segments is called a vertex.
4. To know that a ray is a part of a line that has a fixed starting point.
5. To measure and draw various angles.



DURATION / NO OF PERIODS: 2 LESSONS / 35 + 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Rulers, Geometry Box, Ruler and Protractor



INTRODUCTION

1. Draw the pair of lines on the board as shown below:

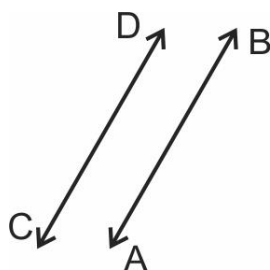


Fig 1

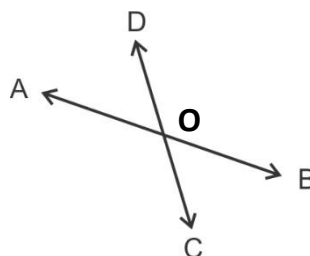


Fig 2(a)

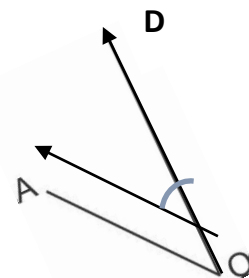


Fig 2(b)

2. Ask students to make as many observations as possible about Fig 1 and 2(a) drawn above. Give students a few moments to think, discuss and share.
3. Tell students that in Fig 1 there are two parallel lines \overline{AB} and \overline{CD} which do not intersect at any point. In Fig 2(a) two non-parallel lines intersect each other at point O.
4. Draw students' attention to Fig 2(b). There is an angle formed (shown in blue) by the intersection of the non-parallel lines.

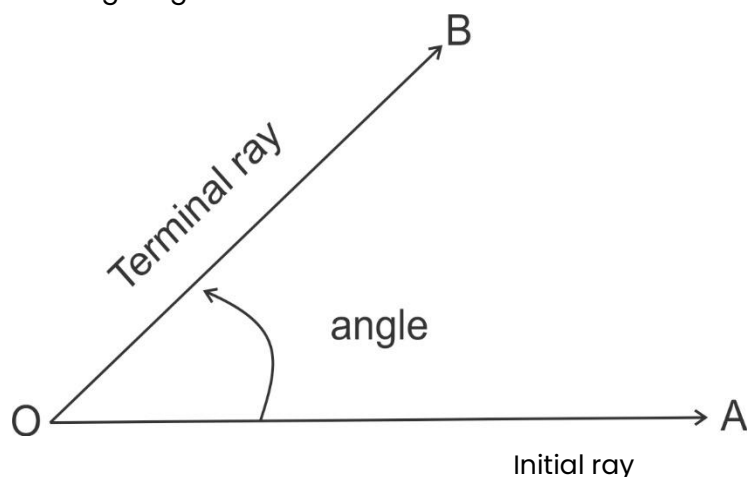
5. Ask students to copy the example above in their notebooks.



DEVELOPMENT

Activity 1:

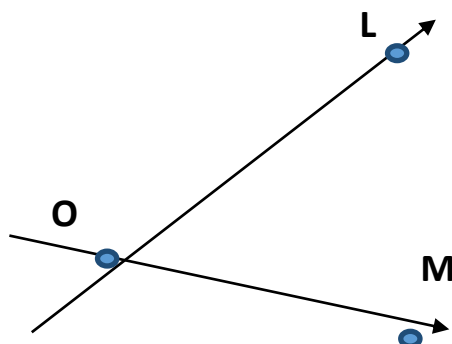
1. Draw the figure given below:



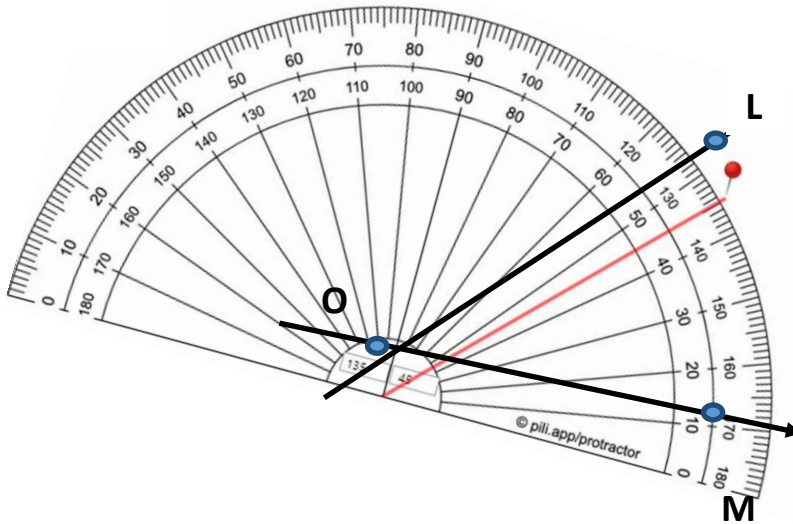
2. Ask students at which point these two non-parallel lines \overrightarrow{OA} and \overrightarrow{OB} meet? Guide students to arrive at the correct answer i.e., \overrightarrow{OA} and \overrightarrow{OB} intersect at point O.
3. Tell students that whenever non-parallel lines intersect each other angles are formed. When lines OA and OB intersect an angle is formed which is represented as $\angle AOB$ or $\angle BOA$.
4. The " \angle " symbol is used to represent angles.
5. Add that the \overrightarrow{OA} and \overrightarrow{OB} are called Initial ray and Terminal ray, respectively.
6. The point of intersection (O) is called the vertex.
7. Ask students to copy the example above in their notebooks.

Activity 2:

1. Draw any two intersecting lines on the board.
2. An example of a ray \overrightarrow{OL} and \overrightarrow{OM} is shown below:



3. Using a protractor, measure the angle $\angle LOM$
4. To do this, place the D / protractor on O in such a way that the point O aligns with the centre point of the protractor and the baseline completely overlaps the ray \overrightarrow{OM} as shown below:



5. Read the inner scale on the protractor. The measure of $\angle LOM = 45^\circ$.
6. Now ask students to individually draw any two non-parallel intersecting lines in their notebooks and measure the angle between them.
7. Do a walk through the class and guide students to measure accurately. Ensure that students measure the acute angle.



CONCLUSION

1. Ask students to summarize the key takeaways in the measurement of angles between two rays.
2. Students should mention that it is important to place the D / protractor on the point of intersection in such a way that the point aligns with the centre point of the protractor and the baseline completely overlaps one of the rays. Ask students to demonstrate this with an example as in Activity 2.

ANGLES



INTRODUCTION

1. Tell students that in the previous lesson we learned how to measure angles using a protractor / D. In today's lesson we learn how to draw angles using some geometrical tools.



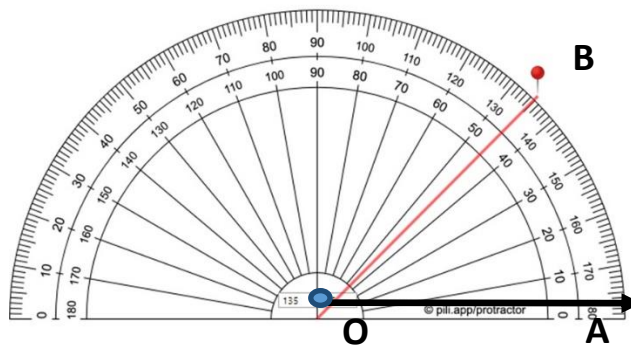
DEVELOPMENT

Activity 3:

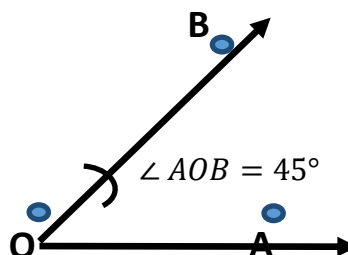
1. On the writing board, draw a horizontal line with starting point O.
2. Tell students that the arrow indicates that this line, if extended, will go well beyond the board as it is a ray OA i.e., it starts at O and passes through A. Tell students to make a similar horizontal ray in their copies.



3. Now place the protractor on O in such a way that the point O aligns with the origin of the protractor and the base line completely overlaps the ray OA as shown below.



4. Using the scale on the protractor, draw a small point B with the pencil at the 45° degree mark (on the inner scale) as shown above. Ask students to do the same with their protractors.
5. Remove the protractor from the page and use a ruler to draw a line starting from O and passing through point B, indicating the 45° -degree angle. Draw an arrow on OB as well to indicate that this is also a ray.
6. Ask students to follow the same step in their notebooks. The final illustration should look as follows:



7. Lastly, label the angle between the two rays as shown above and ask students to do the same and to specifically write $\angle AOB = 45^\circ$.
8. Draw the angles listed below in your notebooks. Students may work in pairs.
 - ✧ $\angle AOB = 30^\circ$
 - ✧ $\angle COD = 55^\circ$
 - ✧ $\angle ROS = 90^\circ$
 - ✧ $\angle XOY = 120^\circ$
 - ✧ $\angle EOF = 160^\circ$
9. Walk around the classroom assisting students with their work and helping them align the protractor with the point O where needed.



CONCLUSION / SUM UP:

Ask students to summarize all the steps in measuring and drawing various angles.



ASSESSMENT

1. Draw any two intersecting lines OA and OB on the board and ask to come up to the board and measure the angle $\angle AOB$ formed at the vertex O.
2. Ask students to draw an angle of measure 45° and 60° with the help of a protractor.



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 142 in exercise 2.

TYPES OF ANGLE



STUDENT LEARNING OUTCOMES

- Differentiate acute, obtuse, and right angles.
- Measure angles using protractor where:
 - ✧ The upper scale of the protractor reads the measure of angle from left to right.
 - ✧ The lower scale of the protractor reads the measure of angle from right to left.

INFORMATION FOR TEACHERS

Teachers should be able:

1. To know that protractors or Ds are used to measure and draw various angles.
2. To tell the difference between acute, obtuse, and right angles.
3. To understand how to use the baseline, center point, inner scale, and outer scale on a protractor.
4. To know that for the inner scale, the measurement is taken from the right to the left and for the outer scale, the measurement is taken from the left to the right.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Rulers, Geometry Box, Teachers Ruler and Protractor, Handouts, Chart



INTRODUCTION

1. Draw the following figures on the board as shown below. Use approximation but make sure that the angle in Fig A is acute (less than 90°) and the angles in Fig B and Fig C are obtuse (greater than 90°).

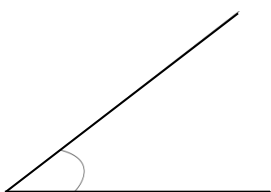


Fig A

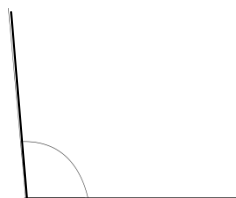


Fig B

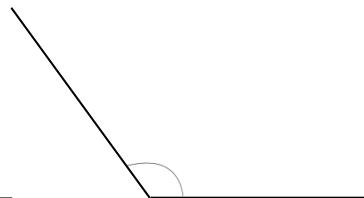


Fig C

2. Ask students which angle is the smallest?
3. Ask students which angle is the largest?
4. Give students a few minutes to discuss in pairs and share their answers.
5. Ask a student to voluntarily to measure the angles in the figures drawn on the board.
6. Guide the student to the correct measurements.
7. Tell students that the angle in Fig A is acute as it is less than 90° .
8. Tell the students that the angles in Fig B and Fig C are both obtuse as they are greater than 90° .

- Lastly, tell students that when the angle between two lines is exactly 90° it is called a right angle.



DEVELOPMENT

Activity 1:

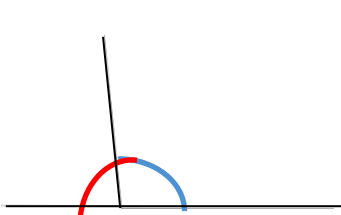


Fig 1

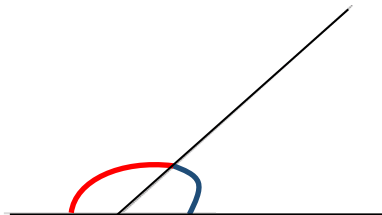


Fig 2

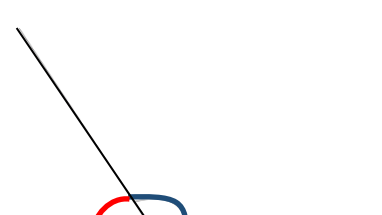
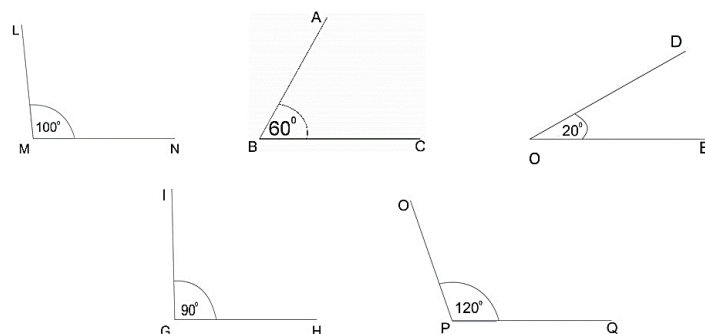


Fig 3

- Make small handouts of the figures shown above.
- Ask students to work in pairs and give one handout with the 3 figures to each pair.
- Tell the students to measure the angles in blue by using the inner scale on the protractor.
- Tell students that we use the inner scale when measuring angles from right to left.
- Tell the students to measure the angles in red by using the outer scale on the protractor.
- Tell students that we use the outer scale when measuring angles from left to right.
- Ask students to write the angles in the relevant places.
- Remind students that to measure angles place the D/protractor on the vertex (intersection point) in such a way that the vertex aligns with the center point of the protractor and the baseline of the protractor completely overlaps the horizontal line shown in the figure.
- Monitor and guide students during the activity.
- Ask a member from each pair to come forward and share their angle measure with the entire class.

Activity 2:

- Draw the given angles on the board (without labeling the angle):



- Ask students to voluntarily to measure these angles with the protractor.
- After measuring the angles ask students to copy and fill in the table shown below.
- The table has been filled in for the teacher. Students should fill in the table themselves.

Acute Angles	Right Angles	Obtuse Angles
$\angle ABC$ $\angle DOE$	$\angle IGH$	$\angle LMN$ $\angle OPQ$



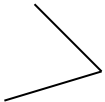

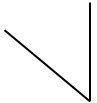


CONCLUSION / SUM UP:

Ask students to differentiate between acute, obtuse, and right angles. Ask students when the inner scale is used and when the outer scale is used on a protractor. Students should recall that the inner scale is used when measuring angles from right to left and the outer scale is used when measuring angles from left to right.



ASSESSMENT

1. The teacher should prepare the chart shown below prior to the lesson.
2. Display the chart on the board.
3. Ask students to come up to the board and match the entry in column A with the corresponding entry in column B.
4. Ask other students to guide the student that comes forward.
5. Ensure maximum student participation.

Match the angle in column A with the correct type in Column B	
Column A	Column B
	Acute angle
	Obtuse angle
	Right angle
	
	



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 142 in exercise 2.

RIGHT ANGLES



STUDENT LEARNING OUTCOMES

- Identify right angles in 2-D shapes.

INFORMATION FOR TEACHERS

Teachers should know that:

- The squares and rectangles have a right angle at each vertex.
- When the measure of an angle is 90° it is called a right angle.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Rulers, Geometry Box, Ruler and Protractor



INTRODUCTION

- Draw the shapes shown below on the board:

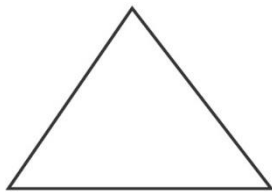


Fig A



Fig B

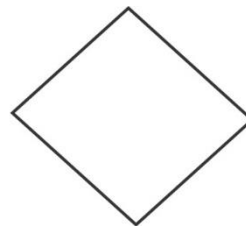


Fig C

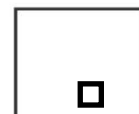


Fig D

- Ask students to identify and categorize all the angles in Fig A, B, C and D as acute, obtuse, or right angles. E.g. Fig B has 2 acute angles and 1 obtuse angle.
- They may use their protractors if unsure.
- Tell the students that Fig C and D are squares and have right angles at each vertex/corner.
- Tell students that they may indicate an angle of 90° by making a small square at the vertex as shown in Fig D.



DEVELOPMENT

Activity 1:

- Draw the shapes shown below on the board:

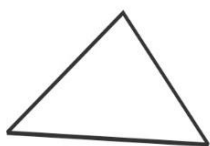


Fig 1



Fig 2



Fig 3

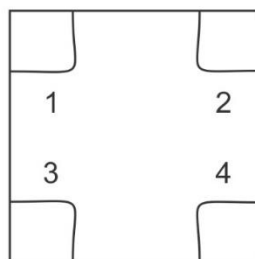
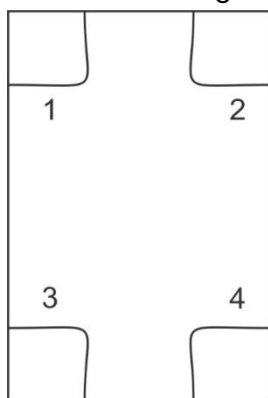


Fig 4

2. Ask students to identify and categorize all the angles in Fig 1, 2, 3, and 4 as acute, obtuse, or right angles. E.g. Fig 4 has 2 acute angles and 2 obtuse angles.
3. They may use their protractors if unsure.
4. The teacher should let students discuss before telling them that Fig 2 and 3 is a square and rectangle respectively and have right angles at each vertex/corner.
5. Tell students to mark right angles by making a small square at the relevant vertices.

Activity 2

1. Draw a rectangle and square on the board and ask students to identify and mark the angles 1,2,3 and 4 for both the rectangle and the square.



CONCLUSION / SUM UP:

1. Ask students what a right angle is and to name some shapes that have right angles. Elicit from students that whenever the measure of an angle is 90° , it is called a right angle.
2. Students should add that squares and rectangles have a right angles at every vertex/corner.



ASSESSMENT

The teacher should ask students the following questions. They should raise their hands in order to answer.

1. How many right angles are in a rectangle?
2. How many right angles are in a square?
3. Can we find the right angle in a triangle? Correct Answer: Yes, there can be a right-angle in a triangle. Such triangles are called right-angle triangles.



HOMEWORK / FOLLOW UP:

Ask students to identify and record in their notebooks, right angles in everyday items like shelves, doors, chairs, desks etc. Ask students to list 5 everyday items that have right angles in them.

PROPERTIES OF CIRCLE



STUDENT LEARNING OUTCOMES

- Describe radius, diameter and circumference in a circle

INFORMATION FOR TEACHERS

Teachers should know the definition and labeling of the radius, diameter, and circumference of a circle.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



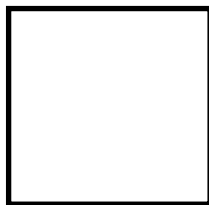
MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Rulers, Compass, Pieces of Rope, worksheet



INTRODUCTION

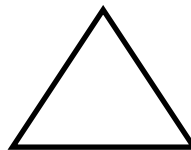
- Ask students to name as many basic shapes as they know.
- Write their responses on the board one by one.
- Now draw the figures shown below on the board:



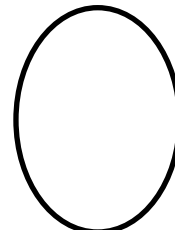
Square



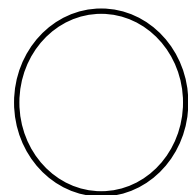
Rectangle



Triangle



Oval



Circle

- Ask students to make observations about the last shape i.e. circle. Give them a few minutes to discuss, observe and share.
- Tell students that a circle or circular shape has no edges or sides and that each circle has a center point normally denoted by O.
- Tell students that in this lesson we will learn about the various parts of a circle.

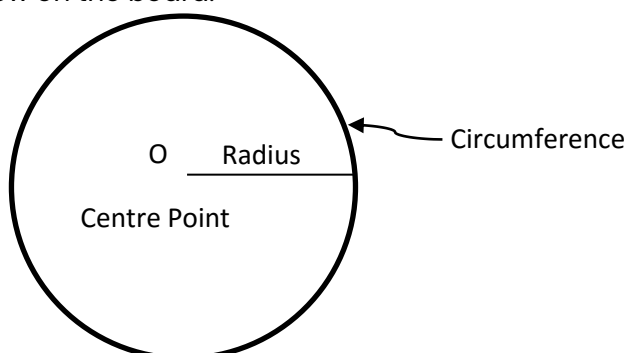


DEVELOPMENT

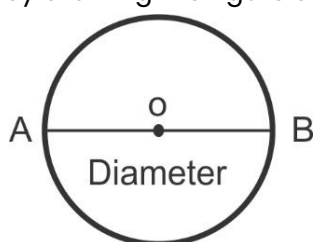
Activity 1

- Choose an open space to do this activity
- Select a few students from the class.
- Draw a fixed point on the ground to represent the center of the circle.
- Ask one student to stand on the center point of the circle.
- Draw a wide circle on the ground, around the center, with chalk.

6. Ask the rest of the students to stand on the line drawn on the ground.
7. Give students a long piece of rope so that each student standing on the outline can hold the rope. Ensure that one revolution/cycle is completed and that shape of the rope resembles the circle that has been drawn.
8. Now take the rope from the students and first make it a perfect circle and then straighten it out in a straight line from end to end.
9. Tell students that the length of rope is called the **circumference**.
10. Take a piece of rope / thick string.
11. Ask the student in the center to hold one end of the piece of rope.
12. Give the other end of the rope to one of the students standing on the outline of the circle.
13. The students standing on the outline of the circle pass their end from student to student, completing one rotation/cycle.
14. Tell the students that the length of this rope represents the **radius** of the circle, it is the distance from the center of the circle to the circumference/outline.
15. Draw the figure shown below on the board.

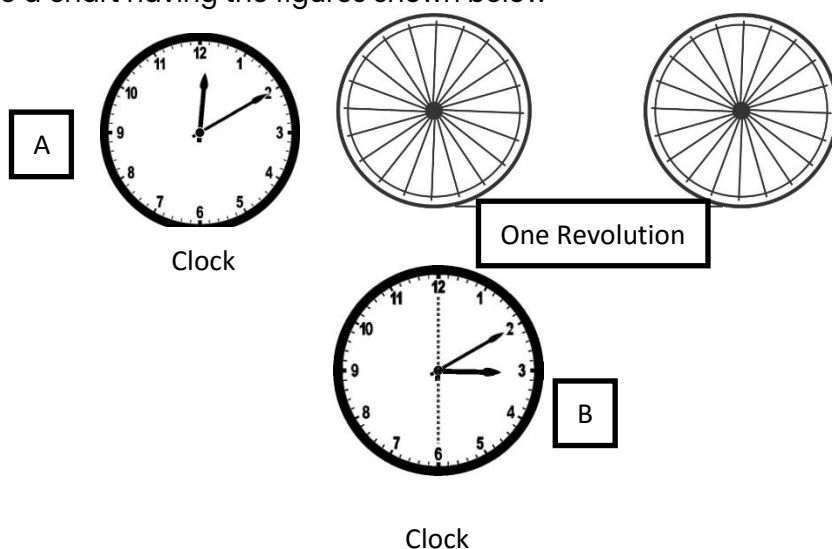


16. Now give students a bigger piece of rope and ask students, standing in the circle, to make the biggest straight line (with the rope) in the circle.
17. Students standing opposite each other will make the biggest straight line.
18. Tell students that the length of the rope represents the **diameter** of the circle. The diameter passes through the center of the circle. The diameter is always 2 times the radius.
19. Show the diameter of the circle by drawing the figure shown below on the board



Activity 2:

1. Prepare a chart having the figures shown below



2. Paste the chart on the board.
3. Write the following questions on the board. Students should copy and fill in the blanks:
 - ✧ The length of the minute hand in Clock A represents the _____ of Clock A. (Ans: radius)
 - ✧ The distance covered by one complete rotation of a cycle wheel represents the _____ of the wheel. (Ans: circumference)
 - ✧ The distance between the digit 6 and 12 in the clock represents the _____ of clock B. (Ans: diameter)
4. Tell students to attempt the questions in their notebooks.
5. Write the correct answers after students have attempted the activity.



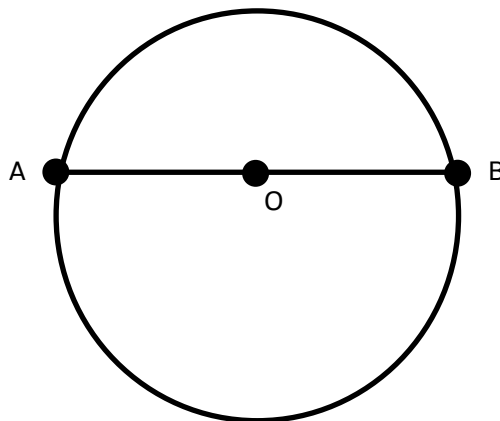
CONCLUSION / SUM UP:

Ask students to outline the differences between the radius, diameter, and circumference of a circle.



ASSESSMENT

1. Prepare the worksheet shown below and distribute it among students.
2. Write **True** or **False** next to the statements below.



- a. \overline{OA} represents the diameter
- b. \overline{AB} represents the radius
- c. \overline{OB} represents the radius



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 146 in exercise 3.

PERIMETER



STUDENT LEARNING OUTCOMES

- Find perimeter of 2-D figures on a square grid.
- Recognize that perimeter is measured in units of length.

INFORMATION FOR TEACHERS

Teachers should be able:

- Understand that the length of the boundary of any shape is called its perimeter.
- Be able to find the perimeter of various rectangles and squares using a square grid.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Worksheets

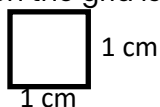


INTRODUCTION

- Draw the figure and grid shown below on the board:

	1	2	3	4	5	6	7	8	
1									1
2									2
3									3
	1	2	3	4	5	6	7	8	

- Ask students which shape is drawn? (Answer: Rectangle)
- Ask students how can you find the length and the width of the rectangle? Direct students' attention to the numbering on the square grid.
- Let students discuss and come up with their answers.
- If students say 3 for width and 8 for length ask them "what 3 means?" and "what 8 means?" to prompt their thinking about the units.
- Tell students that each small square on the grid is 1 x 1 cm



- Now ask students what is the length and width of the rectangle. Guide them to say that the length and width is 3 cm and 8 cm respectively.

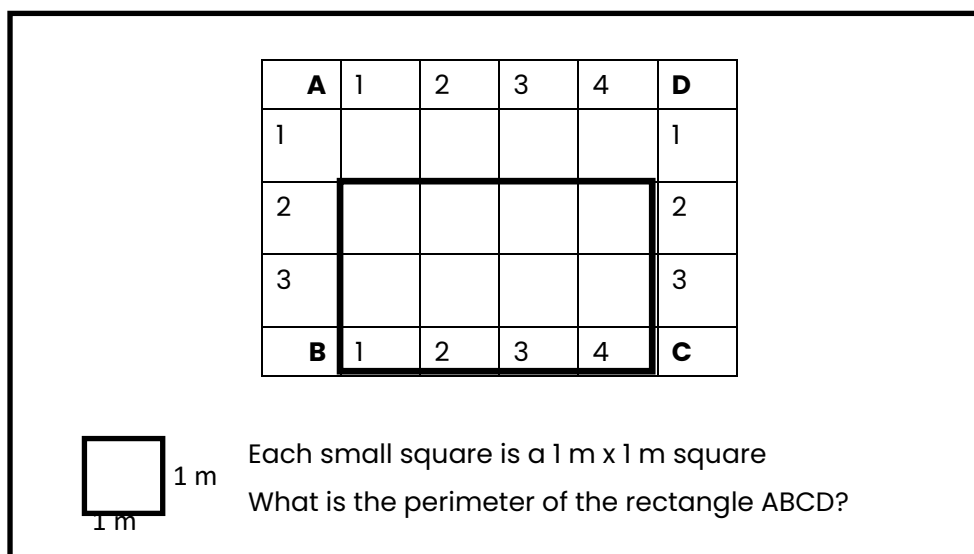
8. Ask students “what is the length of the complete boundary of the rectangle?” or another way of asking is “if you walked around the boundary of the rectangle, how much distance would you cover?”
9. Tell students that this complete length of the boundary is called the **perimeter**.



DEVELOPMENT

Activity 1:

1. Divide the students into pairs.
2. Draw the figure and grid shown below on the board.



3. Ask student to solve the question written on the board in their notebooks. Let them discuss in pairs. Record student responses after a few minutes.
4. Guide students that the perimeter of rectangle ABCD is the sum of all 4 sides i.e. $4 + 3 + 4 + 3 = 14$.
5. Ensure that students remember the units and write the final answer as 14 meters.



CONCLUSION / SUM UP:

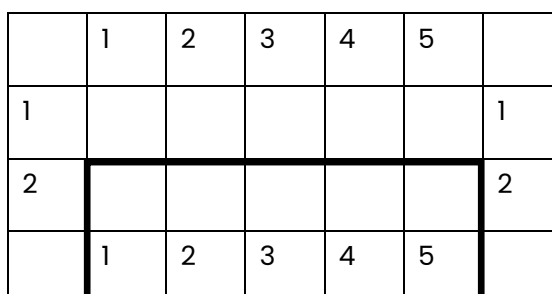
Recall the definition of perimeter i.e. the length of the boundary of that shape. Reminds students that the perimeter of any shape is measured in various units of length such as centimeter and meter.



ASSESSMENT

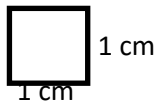
Prepare a worksheet and distribute to the students or draw the figure and grid shown below on the writing board:

a)



b)

	1	2	
1			1
2			2
	1	2	



Each small square is a 1 cm x 1 cm square
What is the perimeter of the rectangle and the square?



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 149 in exercise 4.

SQUARE



STUDENT LEARNING OUTCOMES

- Find area of 2-D figures on a square grid.
- Recognize that area of a square is measured in meter square (m^2) and centimeter square (cm^2)

INFORMATION FOR TEACHERS

Teachers should be able:

1. To understand that the surface covered by a shape is called its area. The area of a square or rectangle can be calculated in cm^2 and m^2 .
2. To find the area of a square or rectangle on a square grid, by counting the number of squares enclosed by the shape.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Worksheets

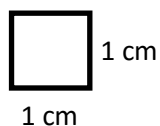


INTRODUCTION

1. Draw the rectangle on the grid shown below on the board:

	1	2	3	4	5	6	7	
	2							
	3							
	4							

2. Ask students which shape is drawn? (Answer: Rectangle)
3. Ask students how much surface is covered by the rectangle?
4. Tell students that each small square on the grid is 1 cm x 1 cm or 1 centimeter square.



5. Let students discuss and come up with their answers.

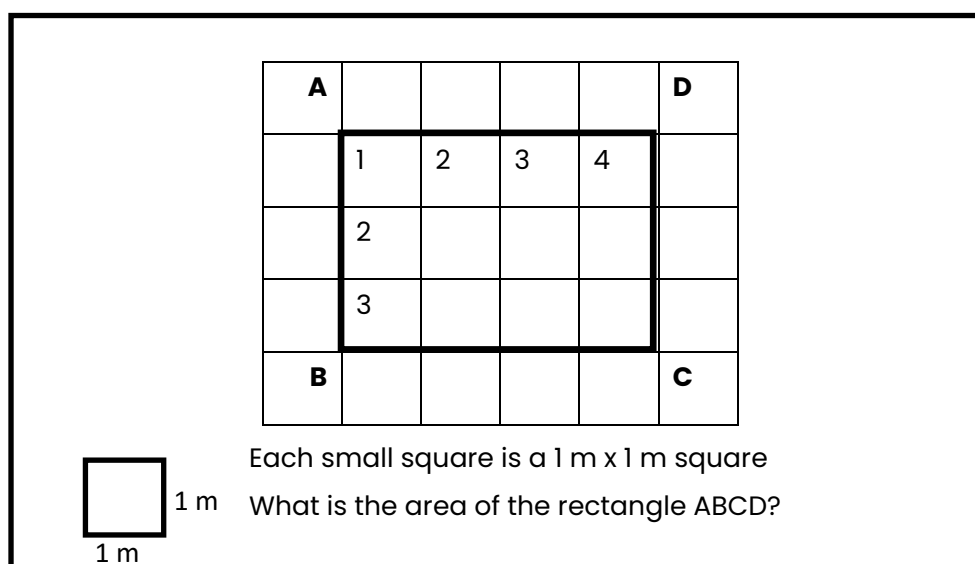
- If students say 28 ask them “what does 28 mean?” to prompt their thinking about the units of area.
- Tell students that the surface covered is measured in the number of square centimeters completely enclosed by the rectangle. In other words the rectangle covered 28 square centimeters.
- Tell students that the surface covered by a shape is called its **area**. In this case the area of the rectangle is 28 cm^2 .



DEVELOPMENT

Activity 1:

- Divide the students into pairs.
Distribute the worksheet to each pair or draw the figure and grid shown below on the board:



- Let them discuss in pairs.
- Guide students that the area of rectangle ABCD is the number of square meters completely enclosed by the rectangle.
- Guide students to count the number of square meters which should be 12. Therefore, the area of rectangle ABCD is 12 m^2
- Ensure that students remember to write the units of area.



CONCLUSION / SUM UP:

Ask students to define and explain area. Students should mention that the definition of area is the surface covered by a shape which can be measured in various square units i.e. in meter square (m^2) and centimeter square (cm^2).



ASSESSMENT


- Prepare the worksheet shown below and distribute among students or Draw the figure and grid shown below on the board:

a)

	1	2	3	4	5	6	
							1
							2

b)

	1	2	
			1
			2
			3



1 cm

Each small square is a 1 cm x 1 cm square

What is the area of the a) rectangle and the b) square?

2. Ask students to independently complete the worksheet. Guide students to the correct answers.



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 149 in exercise 4.

SYMMETRICAL FIGURES



STUDENT LEARNING OUTCOMES

- Recognize lines of symmetry in two-dimensional (2-D) shapes.
- Complete a symmetrical figure with respect to a given line of symmetry on square grid/dot pattern.

INFORMATION FOR TEACHERS

The teacher should understand that:

1. A shape or figure has symmetry when it is turned, flipped, or rotated and the same shape or figure is formed.
2. A line of symmetry divides a shape into two equal parts, which when folded onto each other completely overlaps.
3. Certain shapes have more than one line of symmetry.
4. If one half of a symmetrical shape is given then we can complete it by drawing the remaining half.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



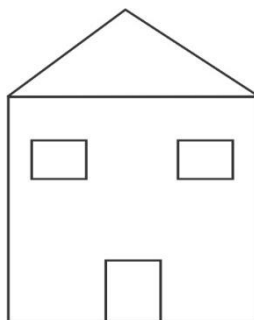
MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Ruler, Worksheet, Cardboard Cut-out



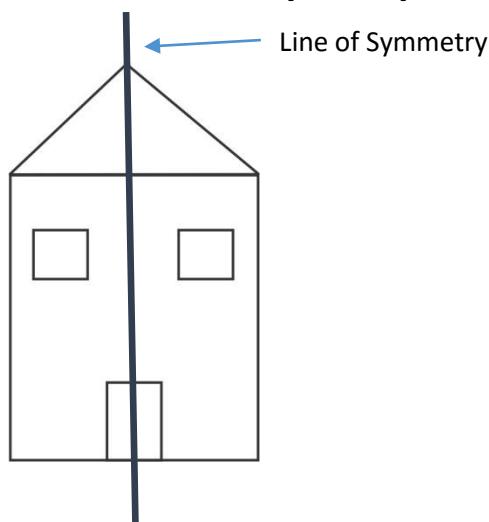
INTRODUCTION

1. Draw the given figure on the board and give students a cardboard cut-out of the figure as well



2. Ask students to fold the cardboard in such a way that the figure completely overlaps. Give students a few minutes to explore and discuss in groups.
3. After exploration, ask a student to come to the board and draw a line on this figure that divides the figure into two equal parts. Tell the student that a horizontal line will not divide the figure into two equal parts.
4. Tell all students that a vertical line right down the centre of the figure will divide it into two equal parts similar to when they folded the cardboard cutout along the centre of the figure and it completely and perfectly overlapped.

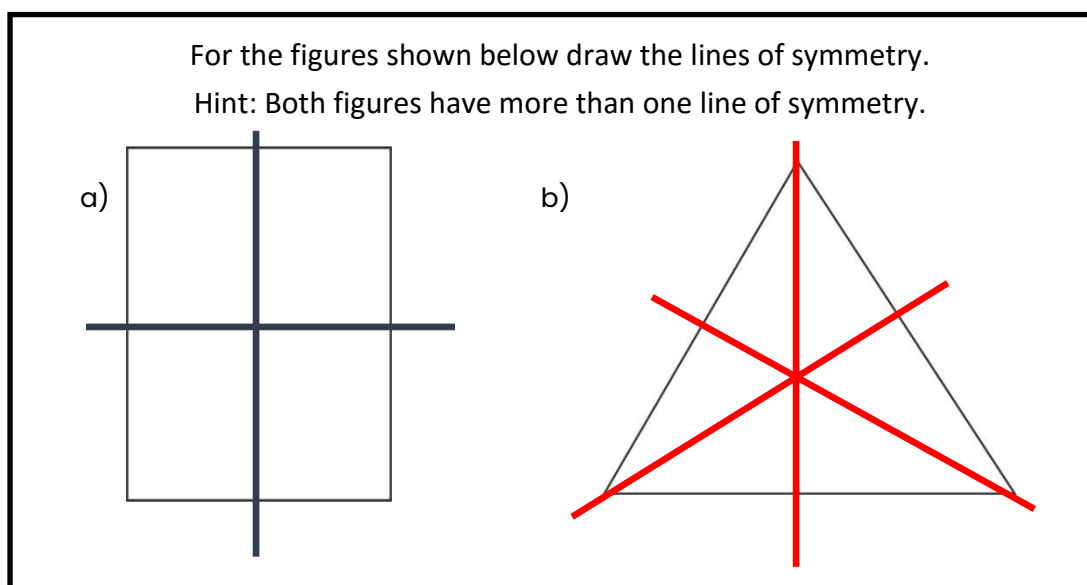
5. Tell students that this line is called the **line of symmetry**.



DEVELOPMENT

Activity I:

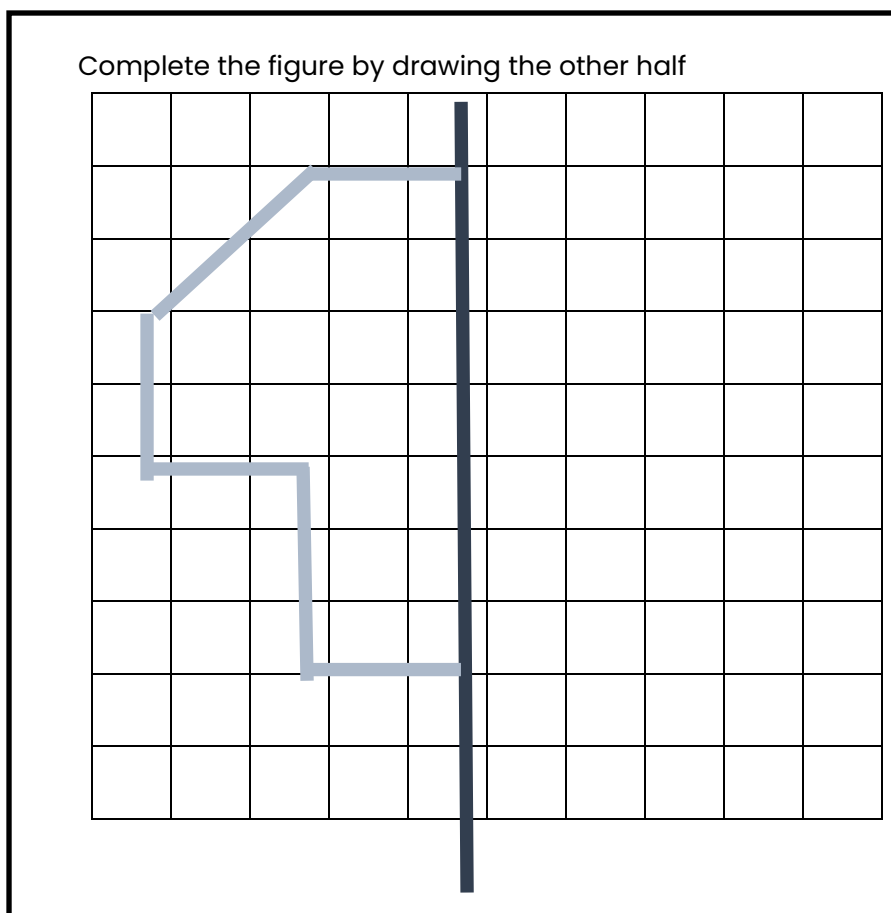
6. Divide the students into pairs
7. Distribute the worksheet shown below to each pair or give cutouts of the shapes to students.



8. Ask pairs to draw the lines of symmetry on both cutouts.
9. Let pairs discuss among themselves. Let them share their responses.
10. Guide students that there are 2 lines of symmetry for the rectangle (shown in blue) and there are 3 lines of symmetry for the triangle (shown in red).
11. The lines of symmetry have been shown on the worksheet only for the teacher. The teacher should ensure that the lines of symmetry are not given in the worksheet distributed to students or drawn on the cutouts.

Activity 2:

1. Distribute the worksheet shown below to each student or paste a chart of the figure shown below.
2. The chart should be prepared prior to the lesson.



3. Tell students to come up to voluntarily to come up to the board and complete the figure by drawing the other half
4. Guide students that for each corner / vertex they should count the units from the line of symmetry. This will help them identify the point to be drawn when completing the figure



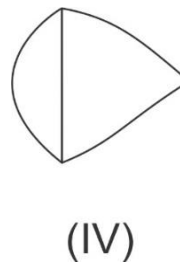
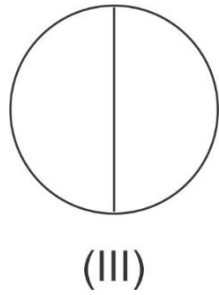
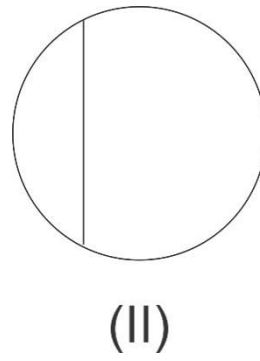
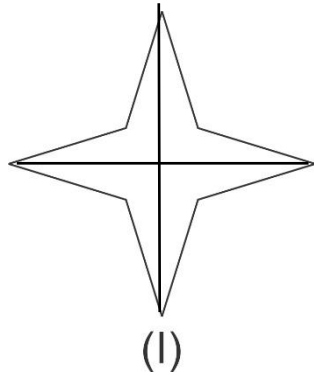
CONCLUSION / SUM UP:

1. Ask students about the line of symmetry so that students highlight that the line of symmetry is a line which divides a shape/object into two equal parts. Students should also emphasize that shapes and figures that have a line of symmetry are called symmetrical objects. Furthermore, students should also mention that a shape may have more than one line of symmetry.



ASSESSMENT

Draw the following figures on the board and ask students to come up to the board and put a tick or a cross next to each figure for a correctly / incorrectly drawn line of symmetry



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 153 in exercise 5.

3-D OBJECTS



STUDENT LEARNING OUTCOMES

- Compare and sort 3-D objects (cubes, cuboids, pyramids, cylinder, cone, sphere)

INFORMATION FOR TEACHERS

Teachers should know:

1. The definitions of vertex, edge and side.
2. The properties of cubes, cuboids, pyramids, cylinders, cones and spheres.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



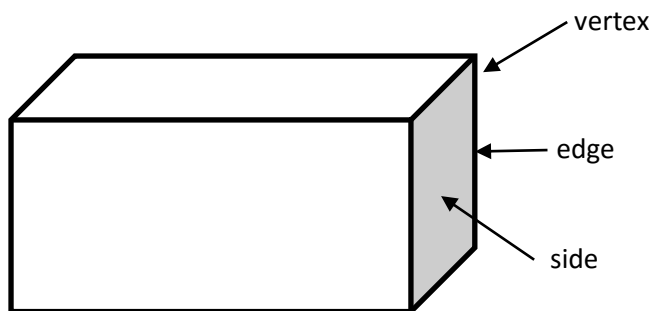
MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Pencils, Chart, Cuboids (shoe box), Cubes (square box), Sphere (Ball), Cylinder (tinned fruit), Cone (ice cream cone), Pyramid (made from cardboard), Worksheet



INTRODUCTION

1. Draw and label a cuboid on the board as shown below



2. Tell students that the straight line is called the **edge**, the meeting point of two edges is called vertex and the flat surface is called the **side**.
3. Now place a shoebox on the table and ask students to make as many observations as possible regarding the vertices, edges and sides of the cuboid.
4. Students should record their observations and draw an image of a cuboid in their notebooks.

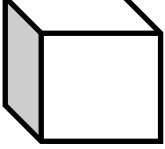
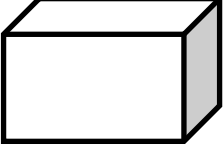
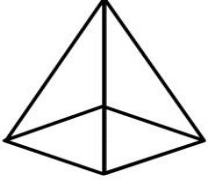
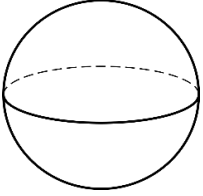
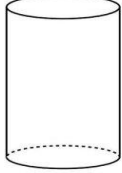
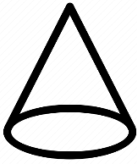


DEVELOPMENT

Activity 1:

1. Divide the students into pairs

2. Display the various 3-D shapes; Cuboids (shoe box), Cubes (square box), Sphere (Ball), Cylinder (tinned fruit), Cone (ice cream cone), Pyramid (made from cardboard) on the teacher's desk for students to observe.
3. Fill the first row for the students after demonstrating how to count vertices, edges and surfaces.
4. Tell the students the name of each shape and write it on the board.
5. Display the following chart on the board. It should be prepared prior to the lesson
6. Tell students to copy and complete the chart in their notebooks after discussing in pairs.

#	3-D Shape	Name	Vertices	Edges	Surfaces / Sides
1		Cube	8	12	6
2					
3					
4					
5					
6					

7. After students have attempted the exercise, the teacher should fill in the chart by calling students from different pairs to come up to the board and enter the data in the correct cells.



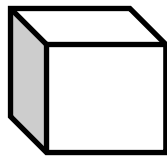
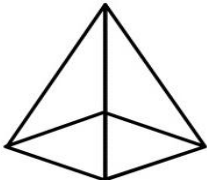
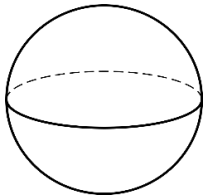

CONCLUSION / SUM UP:

The teacher should ask the students to define vertex, edge and side. Ask students to share various properties (vertices, edges, sides, and shape of surfaces) of cubes, cuboids, pyramids, cylinders, cones and spheres.



ASSESSMENT

1. The teacher should paste the chart shown below on the board. The chart should be prepared prior to the lesson.
2. Match the correct shape with the correct properties

3-D Shape	Properties
	0 vertices 1 surface 0 edges
	0 vertices 3 surfaces 2 edges
	8 vertices 6 surfaces 12 edges
	5 vertices 5 surfaces 8 edges



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 156 in exercise 6.

GRAPHS



STUDENT LEARNING OUTCOMES

- Read simple bar graphs given in horizontal and vertical form.
- Interpret real life situations using data presented in bar graphs.

INFORMATION FOR TEACHERS

Teachers should know:

1. How to represent data in simple bar graphs; both in horizontal (left to right) and vertical (top to bottom) forms.
2. How to represent real life data like different types of blood types, heights, temperature etc. in bar graphs.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



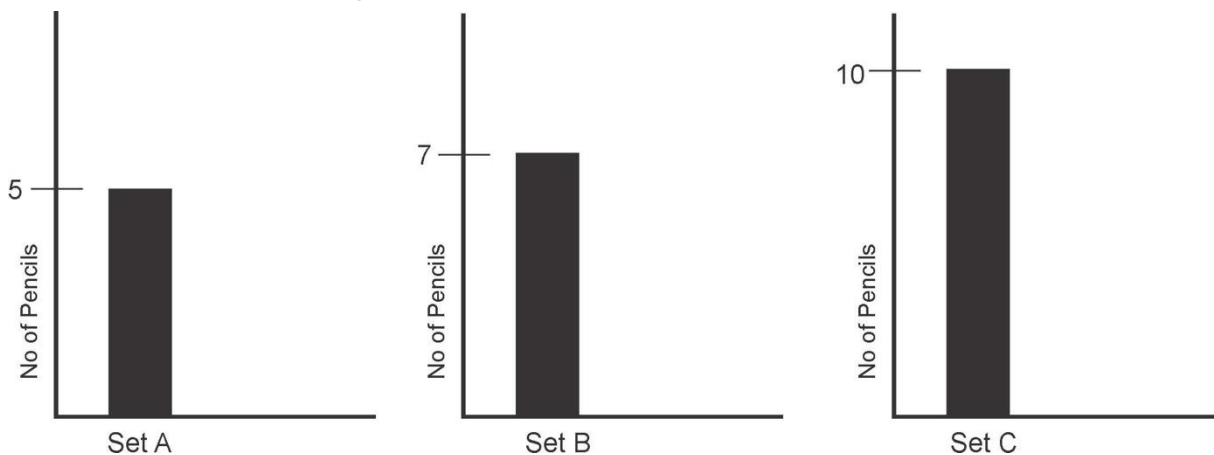
MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Worksheet



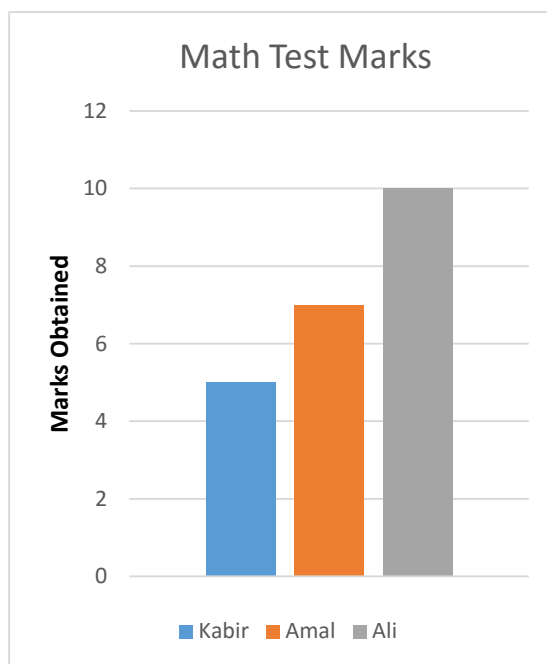
INTRODUCTION

1. Draw the following bar graphs on the writing board or prepare a chart and paste it on the board before the class begins.



2. Ask students to take a few minutes and make observations about the bar graphs in pairs.
3. Ask students to discuss in pairs what the bar represents. Ask a few pairs to share their observations.
4. Ask students what the 1st bar represents? Answer: Number of pencils in set A is 5.
5. Ask students what 2nd bar represents? Answer: Number of pencils in set B is 7.
6. Ask students what 3rd bar represents? Answer: Number of pencils in set C is 10.

7. Take student responses and tell them that these bars represent the number of pencils in set A, B and C.
8. Draw the following vertical bar graph on a chart paper and paste it on the board before the class begins.



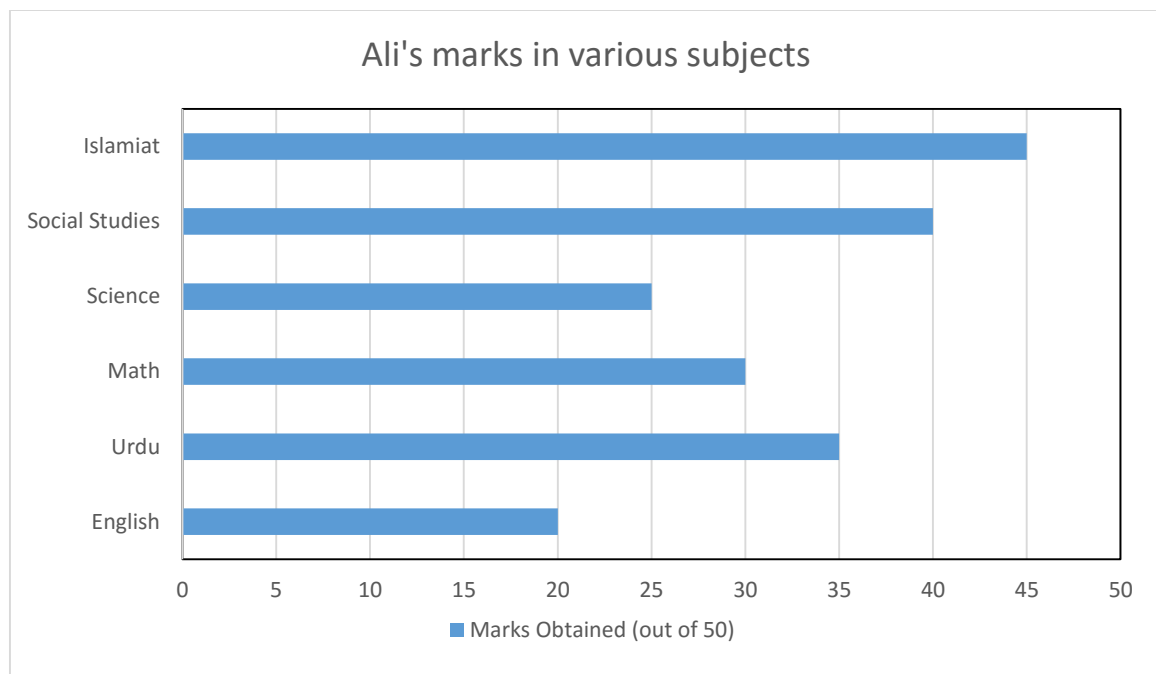
9. Ask students what does the vertical bar graph show?
10. Give students some time to observe and discuss in pairs any observations they make regarding the vertical bar graph.
11. Tell students that the bar graphs represent the marks obtained by three students: Kabir, Amal and Ali in a math test.
12. Ask students the following questions:
 - a. who scored the highest marks in the math test?
 - b. who scored the lowest marks in the math test?
13. Ask students how many marks did Amal score?
14. Record student responses and point out how to read the different bars for e.g., in order to answer who scored the highest marks in the math test, we look at the tallest bar i.e., the green bar and then match green with the names. This tells us that Ali has the highest marks in the math test.
15. Tell students that we will be learning how to read and interpret vertical and horizontal bar graphs.



DEVELOPMENT

Activity I:

1. Draw the following graph on a chart paper and paste it on the board before the class begins.
2. Tell students to discuss in pairs what the graph represents.
3. After taking a few responses, tell the students that the graph shows Ali's marks in different subjects.



4. Give students a few moments to make as many observations about the graph as possible.
5. Ask pairs to answer the following questions:
 - ✧ How many marks did Ali get in Urdu?
 - ✧ How many marks did Ali get in Social Studies?
 - ✧ In which subject did Ali get the highest marks?
 - ✧ In which subject did Ali get the lowest marks?
6. Record student responses and show students how to read the different bars for e.g., in order to answer how many marks Ali scored in *Urdu*, we look at the bar in front of *Urdu* i.e., the bar that is on top of *English*. This tells us that Ali has scored 35 marks (out of 50) in *Urdu*.
7. Make sure students participate in the discussion. For each question guide students to look at the specific bar and then look at the marks obtained in that subject.

Activity 2:

1. Continue with the same graph as in Activity 1
2. Divide the class in small groups and ask them to find how many total marks did Ali get in all subjects?
3. Ask students to share their solutions.
4. Record student responses and tell students how the question had asked them to add up all of the scores in all subjects. Therefore, the correct answer is: $20 + 35 + 30 + 25 + 40 + 45 = 195$



CONCLUSION / SUM UP:

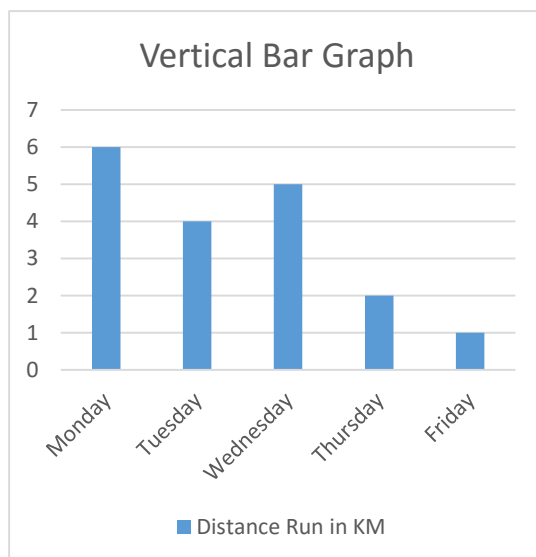
Ask students to explain the use of bar graphs. Students should mention that bar graphs represent data with simple bars. Students should highlight that with the help of bar graphs we can easily represent, read, and interpret data in vertical and horizontal forms.



ASSESSMENT

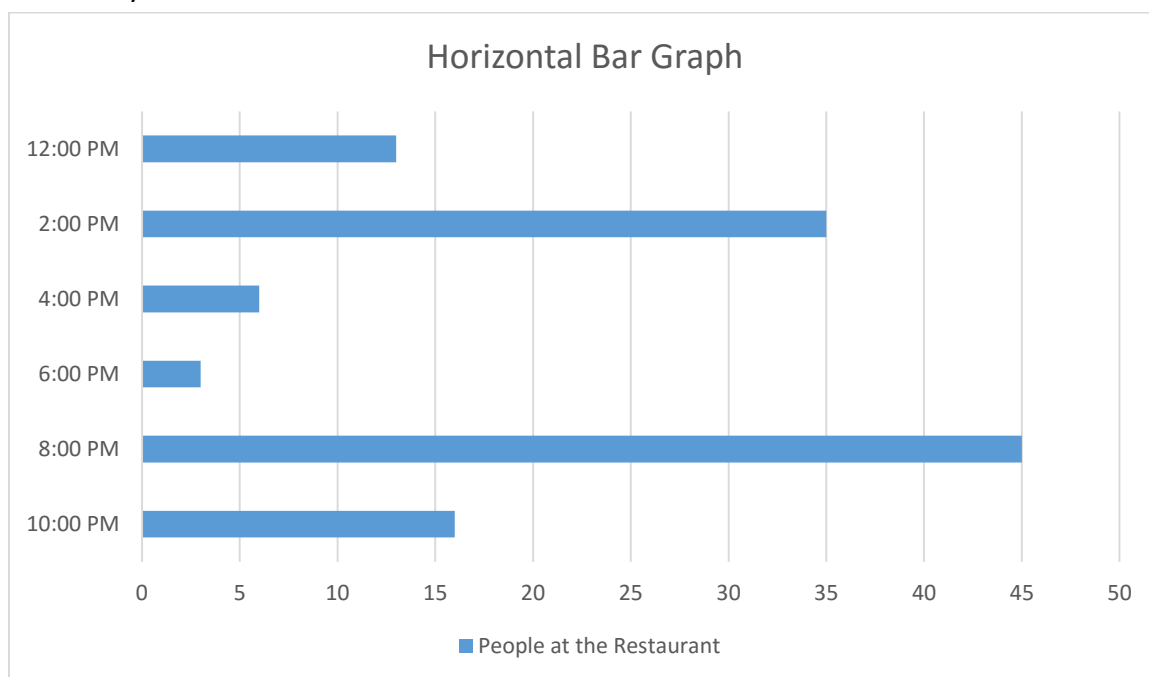
1. Prepare a worksheet based on the following questions and distribute it to the class.

2. If printing worksheets is not possible then use a chart paper for this activity.
3. Tell students to answer each question and then paste their worksheet in their notebooks.
4. The vertical bar graph represents the distance run every day by Salman in a given week. Answer the questions that follow.



- ✧ How many km did Salman run on Wednesday?
 - ✧ On which day did Salman run the most?
 - ✧ On which day did Salman run the least?
 - ✧ What is the total distance Salman running from Monday to Friday?
5. Give students the correct answers with explanation after they have attempted the question and shared their responses.

The horizontal bar graph represents the number of people in a restaurant at different times in one day.



- ✧ At what time were there the fewest people in the restaurant? Approximately how many people were there at that time?
- ✧ At what time were there the most people in the restaurant? Approximately how many people were there at that time?

6. Give students the correct answers with explanation after they have attempted the question and shared their responses.



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 167 in exercise 1.

INTERPRETING GRAPHS



STUDENT LEARNING OUTCOMES

1. Read line graph.
2. Interpret real-life situations using data presented in line graphs.

INFORMATION FOR TEACHERS

Teachers should be able to:

1. Represent data in simple line graphs.
2. Represent real-life data like the number of COVID cases, frequency of an event happening, etc. in line graphs.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



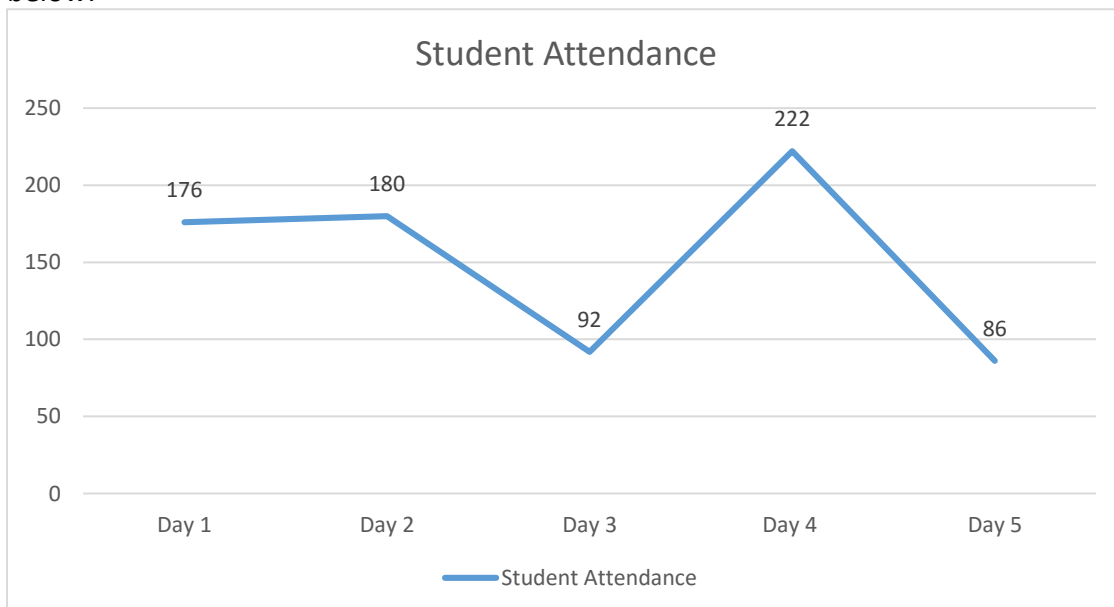
MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Worksheet, Charts



INTRODUCTION

1. Prepare the chart given below and paste it on the board before the lesson.
The number of students who attended an event over 5 days is represented in the line graph below:



Day Number	Student Attendance
Day 1	176
Day 2	180

Day 3	92
Day 4	222
Day 5	86

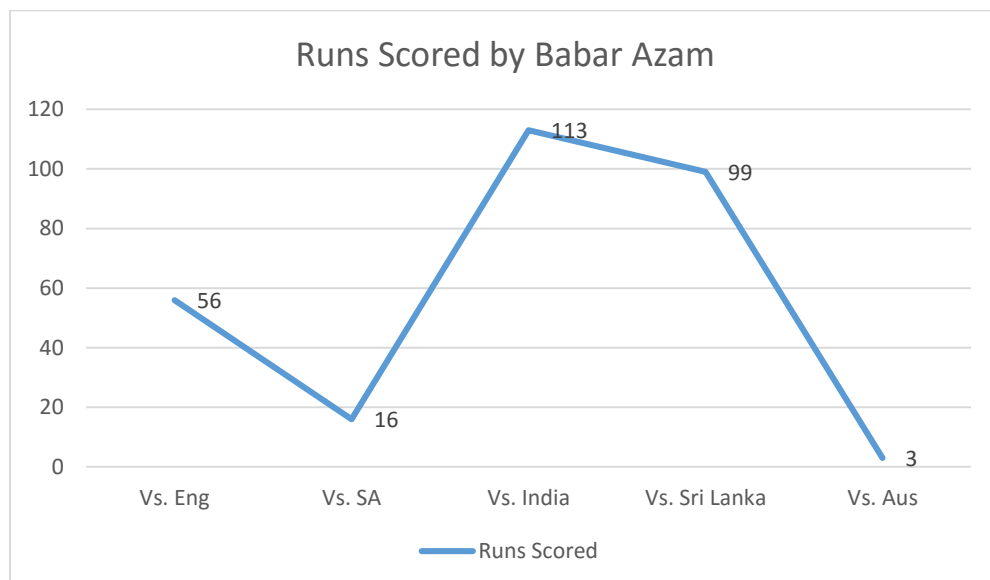
2. Give students a few moments to work in pairs and make as many observations about the line graph as possible.
3. Ask students what does the line graph represents? Ans: Students attendance at an event over 5 days
4. Ask students which day had the highest student attendance? What was the student attendance that day? Ans: Day 4. 222 students attended.
5. Ask students which day had the lowest student attendance? What was the student attendance that day? Ans: Day 5. 86 students attended.
6. Guide student discussion and record their responses.
7. Share the correct answer for each question with the students.
8. Tell students that we will be learning how to read and interpret vertical and horizontal bar graphs.



DEVELOPMENT

Activity 1:

1. The teacher will prepare and paste the chart on the board before the lesson.
The following line graph shows the runs scored by Babar Azam (cricketer) in 5 matches.



2. Give students to work in pairs and make as many observations about the graph as possible.
3. After a few minutes ask students to share their responses by raising their hands to answer the following questions:
 - ✧ What was the highest score that Babar Azam scored over the 5 matches? Against which team did he score this? Ans: 113 vs. India.
 - ✧ What was the lowest score that Babar Azam scored over the 5 matches? Against which team did he score this? Ans: 3 vs. Australia.
 - ✧ How many runs did Babar Azam Score against England? Ans: 56.
4. Make sure students participate in the discussion and answers. Guide student discussion and record their responses.

5. Share the correct answer for each question with the students.

Activity 2:

1. Divide the class into different groups to answer the question about the graph shown above:
How many total runs did Babar Azam score in the 5 matches?
2. Ask groups to share their responses.
3. Share the correct solution with students after all groups have attempted the question.



CONCLUSION / SUM UP:

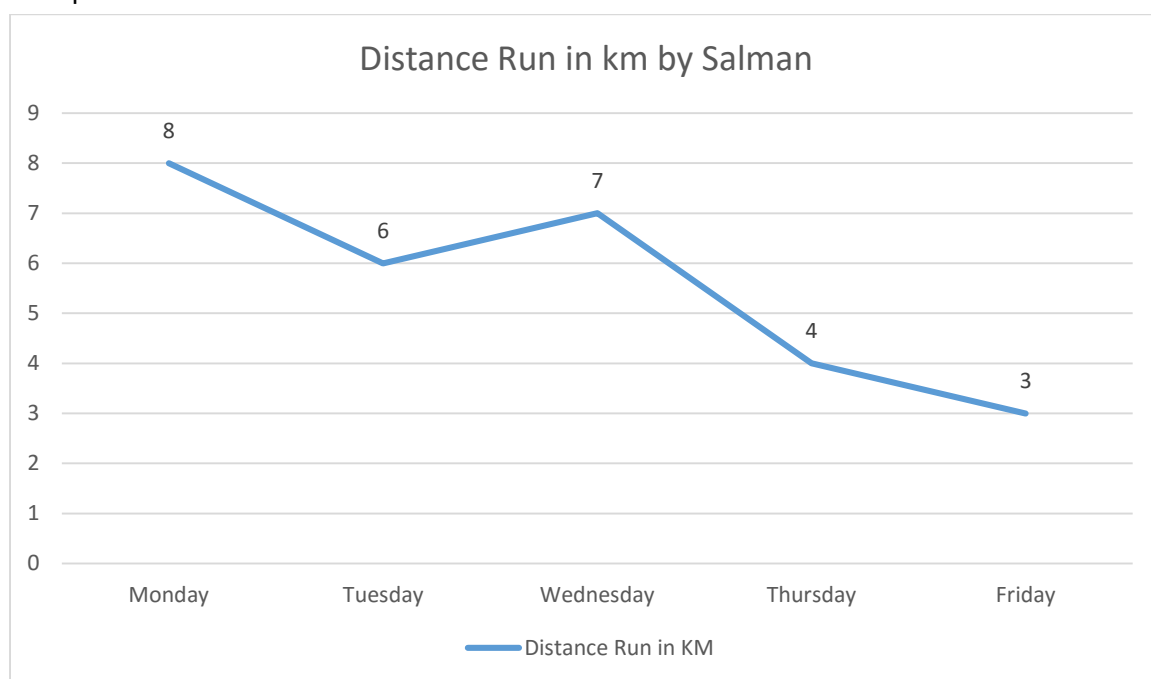
1. Conclude the lesson by explaining that line graphs are representations of data that we come across every day.
2. Tell students that with the help of line graphs we can easily represent, read and interpret various types of data.



ASSESSMENT

1. Distribute one copy of the given worksheet to each student or prepare a chart.
2. The teacher should prepare and paste the chart on the board before the lesson. Tell students to answer each question in their notebooks. After students have attempted the questions, share the correct solutions with them.

The line graph represents the distance run every day by Salman in a given week. Answer the questions that follow.



- ✧ How many km did Salman run on a Wednesday?
- ✧ Which day did Salman run the most?
- ✧ Which day did Salman run the least?
- ✧ What is the total distance Salman ran from Monday to Friday?



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 171 in exercise 2.

PIE CHART



STUDENT LEARNING OUTCOMES

- Read Pie Chart.
- Interpret real-life situations using data presented in a Pie Chart.

INFORMATION FOR TEACHERS

Teacher should be able:

1. To represent data in simple pie charts; each sector representing only one type of something.
2. To know that pie charts are also called circle graphs.
3. To represent real-life data like different categories of something etc. in pie charts.



DURATION / NO OF PERIODS: 1 LESSON / 35 MINUTES



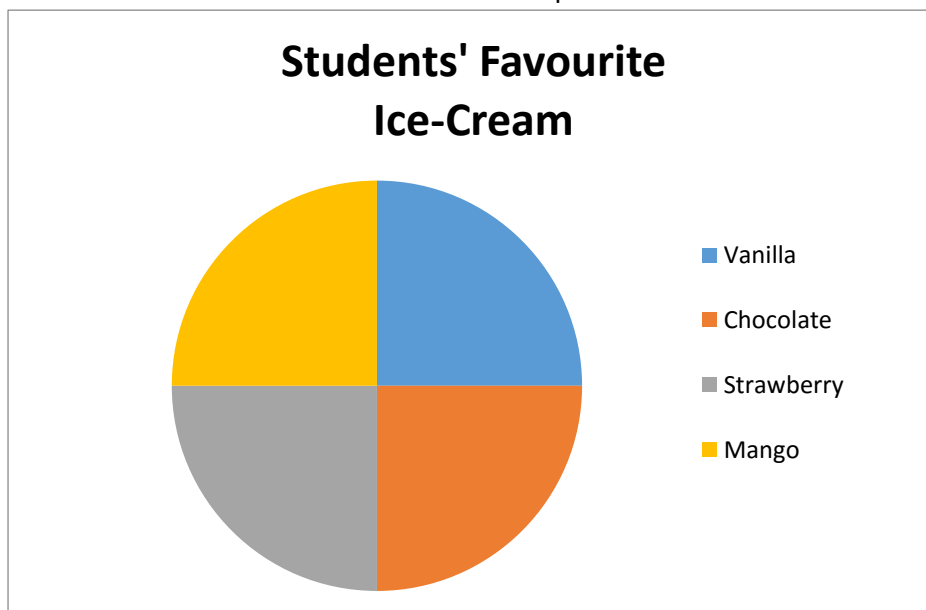
MATERIALS / RESOURCES REQUIRED

- Board, Marker, Notebooks, Textbooks, Worksheet



INTRODUCTION

1. Draw a circle on the board. Divide it into four parts.



2. Write "Strawberry" in the 1st sector (slice), "Chocolate" in the 2nd sector, "Vanilla" in the 3rd, and "Mango" in the 4th. Sector.
3. Tell students that the green sector/slice represents the students who like strawberry ice cream.

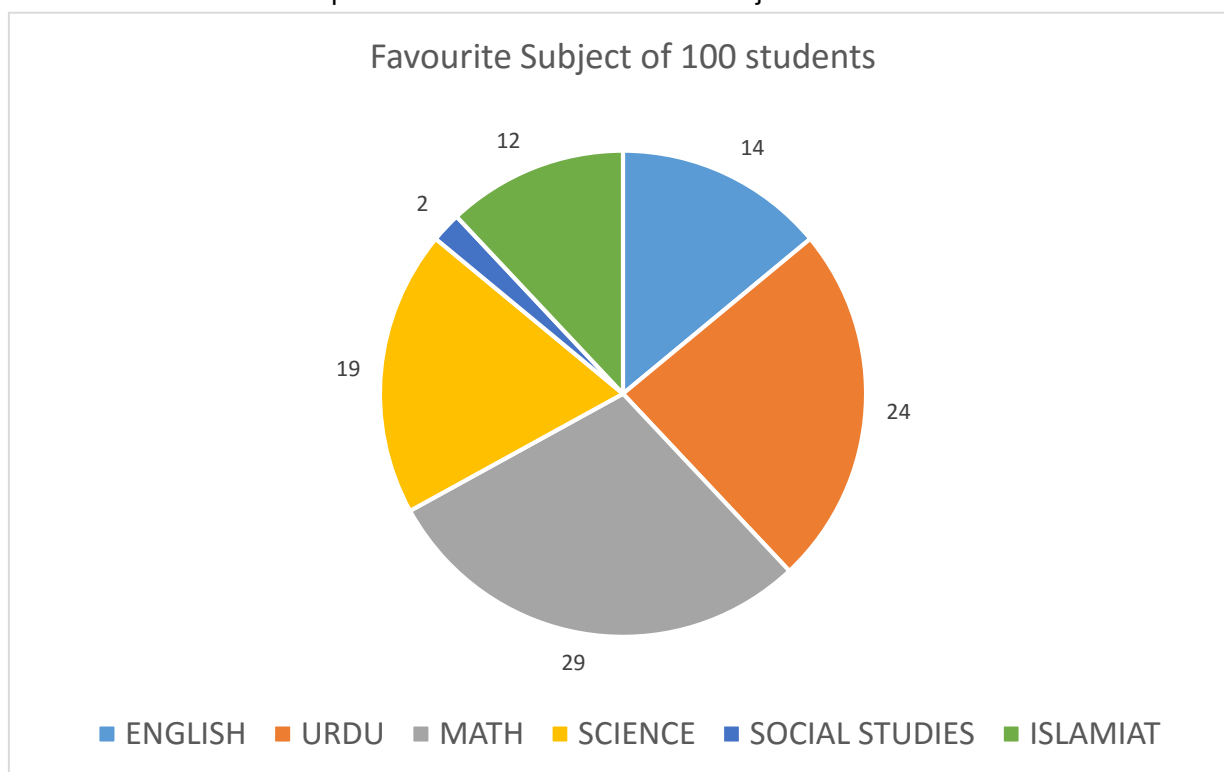
- The blue sector/slice represents the students who like vanilla ice cream.
- The red sector/slice represents the students who like chocolate ice-cream
- The purple sector/slice represents those students who like mango ice cream.
- As all the four sectors of the **pie-chart** (use this word) are equal, each is a quarter slice, the number of students who like strawberry, vanilla, chocolate, and mango ice cream is equal.
- Tell students that in this lesson we will learn how to read and interpret pie charts.



DEVELOPMENT

Activity 1:

- Draw the given pie chart on the chart paper. Paste it on the board before the start of the lesson.
- Tell students that the pie chart shows the favorite subject of 100 students at a school.



- Give students a few moments to make as many observations about the pie chart as possible.
- Ask the students to work in pairs and to raise their hands and answer the following questions:
 - Which subject is the most popular? How many students like that subject?
 - Which subject is the least popular? How many students like that subject?
 - How many students selected Science as their favorite subject?
 - How many students selected English as their favorite subject?
- Make sure students participate in the discussion and answers. After receiving and recording student feedback share the correct answers.
- Repeat that this type of data representation is called a **pie chart**



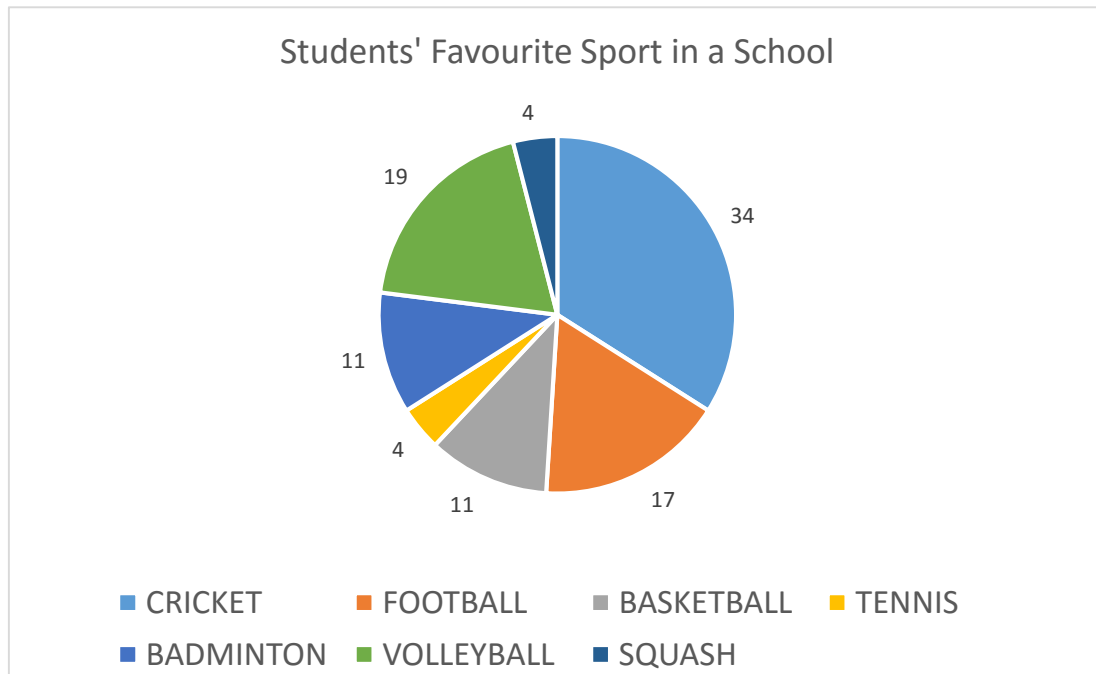
CONCLUSION / SUM UP:

Ask students to list some features of pie charts. Ask students how to pie charts represent data. Students should mention that pie charts can be used for representations of data that we come across every day like the favorite subjects of students. Students should highlight that each sector/ slice in a pie chart represents only one type of thing.



ASSESSMENT

1. Distribute one copy of the given worksheet to each student or draw on chart paper and paste it on the board. The chart should be prepared before the start of the lesson.
2. The favorite sport of 100 students is represented in the pie chart below:



3. Ask students to work in pairs.
4. Ask students what does the pie chart represents?
5. Ask the students to raise their hands and answer the following questions:
 - a. Which sport is the most popular? How many students chose that sport?
 - b. Which sport is the least popular? How many students chose that sport?
 - c. How many students selected volleyball as their favorite sport?
 - d. How many students selected badminton as their favorite sport?
6. Make sure students participate in the discussion and answers. After receiving and recording student feedback share the correct answers.



HOMEWORK / FOLLOW UP:

Assign the relevant questions from the textbook on page 173 in exercise 1.

قومی ترانہ

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تو نشان عزم عالی شان ارض پاکستان!
مرکز یقین شاد باد

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شاد باد منزل مراد

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