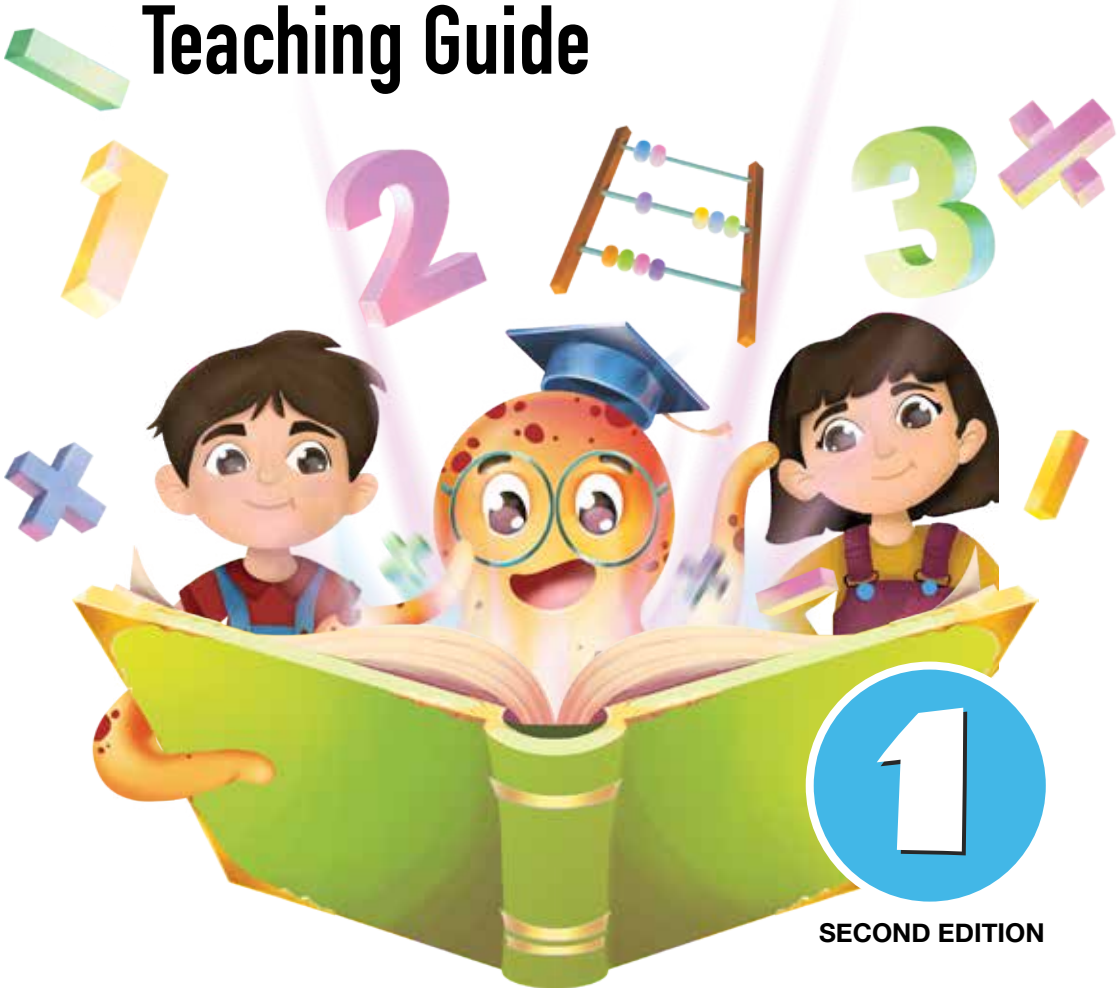
MATHS WISE

Teaching Guide



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SECOND EDITION

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Plan Your Work and Work Your Plan

Before creating a lesson plan, it's essential to understand the art of teaching. Effective teaching involves connecting with students' daily lives and revisiting previously learned material. A well-structured lesson plan is crucial to engaging every student in the classroom. There are three key components to lesson planning:

A. Curriculum:

A curriculum should be tailored to meet students' needs and school objectives, avoiding overambition and haphazard planning, particularly in math education.

B. Instruction:

Teachers can use various methods, such as verbal explanations, visual aids, and inquiry-based learning, to deliver instruction. The best teachers adapt their approach to suit their students' needs, continuously updating their skills and methodology.

C. Evaluation:

Evaluation is a tool to assess not only students' understanding but also the effectiveness of the teacher's instruction. It helps teachers refine their approach and ensure students achieve their full potential.

By considering these three facets, teachers can create comprehensive lesson plans that promote meaningful learning and student engagement.

D. Long-term Lesson Plan

A long-term lesson plan covers the entire term and typically involves school coordinators outlining the core syllabus and unit studies. When planning, two crucial factors to consider are:

- **Time frame:** Allocating sufficient time for each topic to ensure comprehensive coverage.
- **Prior knowledge:** Assessing students' existing knowledge of the topic to inform the planning process.

An experienced coordinator will consider the topic's complexity and the students' ability to grasp it within the given time frame. Assigning the optimal number of lessons for each topic is essential to avoid overspending time on easier topics, which could impact the time needed for more challenging topics later.

E. Suggested Unit Study Format

Weeks	Dates	Month	Number of Days	Remarks

Short-term Lesson Planning

The responsibility of the course teacher. The term "lesson" originates from the Latin word "lectio," meaning the action of reading, but in this context, it refers to the action of teaching a topic in the classroom. To plan a topic effectively, consider the following suggested format, while also being open to adapting and improving your approach based on your school's and colleagues' methods.

When planning a lesson, consider the following steps:

1. **Topic:** Identify the topic title.
2. **Overview:** Assessing students' prior knowledge of a topic is a crucial step in the learning process, involving the evaluation of what students already know, understand, and can do related to the topic before instruction begins.

To assess prior knowledge, teachers can use various methods, including:

- Pre-assessment quizzes or tests to gauge students' understanding of the topic.
- Class discussions to explore students' thoughts, ideas, and experiences related to the topic.

By assessing prior knowledge, teachers can create a more effective and engaging learning environment, ultimately leading to better student outcomes.

3. **Objectives:** Clearly defining the learning objectives for a topic is a crucial step in the lesson planning process. Learning objectives specify what students are expected to know, understand, and be able to do by the end of the lesson or topic.

By clearly defining learning goals, teachers can create a roadmap for instruction, guide assessment, and promote student understanding, ultimately leading to more effective teaching and learning.

4. **Time Frame:** Accurately estimating the time required for each topic is vital to ensure a successful lesson plan. However, class dynamics can be unpredictable, and flexibility is essential to adapt to the unique needs and responses of each class. Note that introductory sessions often require more time, but as the topic progresses, students may learn faster, allowing for potential reductions in the allocated timeframe.

To effectively manage classroom time, teachers should:

- establish a general time frame for each topic,
- be prepared to adjust as needed,
- monitor student progress,
- prioritize essential tasks, and leave buffer time for unexpected events or questions, ensuring a flexible and adaptive lesson plan.

5. **Methodology:** This refers to how you will demonstrate, discuss, and explain the topic to your students. Effective methodology involves using a range of teaching methods to cater to different learning styles, incorporating technology, providing opportunities for questions and feedback, and encouraging active learning through group work and problem-solving activities. By using varied methodologies, teachers can create an engaging, interactive, and student-centred learning environment that promotes deeper understanding and application of the topic.

6. **Resources Used:** Refers to the materials and tools needed to support teaching and learning.
   - **Tangible materials:** Everyday objects that will help students to visualize and understand complex concepts.
   - **Printed materials:** Exercise books, worksheets, and test worksheets to provide students with hands-on practice and assessment opportunities.
   - **Assignments and projects:** Longer-term tasks that require students to apply their knowledge and skills.
   - **Digital resources:** Online tools, software, and multimedia resources, such as educational apps, videos, and interactive simulations, to enhance engagement and understanding.

By identifying and listing the resources needed, teachers can ensure that they have everything required to deliver effective instruction and support student learning.

7. **Continuity:** Continuity refers to reinforcing learning throughout a topic to ensure students retain and build upon previously acquired knowledge. To achieve continuity, teachers can alternate between class work and homework, gradually increase task difficulty, use varied teaching methods and resources, and provide regular feedback and assessment. By planning for continuity, teachers help students develop a strong foundation of knowledge and skills, making connections between lessons and topics, and promoting deeper understanding and application of the subject matter.
8. **Supplementary Work:** To further enhance student learning, teachers can consider additional activities to complement their instruction.
   - **Group projects or individual research:** Encourage students to work collaboratively or independently on projects that delve deeper into the topic, promoting critical thinking, problem-solving, and creativity.
   - **Presentations or assignments:** Provide opportunities for students to demonstrate their understanding through presentations, reports, or other assignments, helping to develop their communication and critical thinking skills.
9. **Evaluation:** Ongoing assessment is essential to monitor student progress, identify areas of improvement, and inform teaching adjustments. Strategies include:
   - **Regular quizzes and self/peer correction:** Administer quizzes to check students' understanding and provide opportunities for self-reflection and peer feedback.
   - **Formal tests at the end of the topic:** Conduct comprehensive tests to assess students' mastery of the topic and identify areas where they may need additional support.
   - **Continuous monitoring of student progress:** Regularly review student work, observe their participation, and engage in one-on-one discussions to inform teaching adjustments and ensure students are on track to meet learning objectives.

By incorporating supplementary work and ongoing evaluation, teachers can create a comprehensive and supportive learning environment that fosters student growth and achievement.

Scheme of Work

Unit: Estimated number of Lessons:

Specific Learning Outcomes (SLOs):

These are the expected changes or improvements in students' knowledge, attitudes, or skills by the end of a lesson. Teachers should list the SLOs in a precise format, ensuring they are SMART (Specific, Measurable, Achievable, Relevant, Time-bound). There can be multiple SLOs for a lesson.

Prior Knowledge Assessment:

Teachers should list clear, concise questions to assess students' awareness before introducing new concepts and skills. These questions can be asked randomly or as a quiz but should be brief. This assessment demonstrates students' readiness to learn and stimulates interest. Teachers should have a clear idea of the expected answers.

Resources:

Plan a short activity or strategy to capture students' attention and transition from the previous lesson. This activity should be interesting and relevant to the students, such as a discussion on scientific exploration, interesting facts, or real-life applications of the topic. Outline the teaching activities and steps in sequence, specifying their impact on student learning.

Class Assignment:

Specify the written work students will complete in their notebooks during the lesson.

Home Assignment:

Specify the work students will do at home. Home assignments should reinforce or extend what was learned in class, not repeat the same work or introduce entirely new topics.

Evaluation:

Evaluation should occur within the lesson through activities or tools that assess students' learning based on the lesson's objectives. Home assignments should not be used for evaluation. Teachers should evaluate students during and after learning to understand their progress and adjust teaching methods accordingly. Assessment is ongoing and can be formative or summative.

Ways to Evaluate Teaching and Student Learning:

- Oral Assessment: Ask concept-check questions.
- Written Assessment: Use quizzes, games, classwork, homework, and tests.
- Teacher's Assessment: Engage students in discussions or observe them during activities.
- Peer Assessment: Students provide feedback on their classmates' work.
- Personal Assessment: Students evaluate their own performance.

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Bringing Innovative Mathematical Pedagogy to the Classroom

Introduction

Effective mathematics instruction is a complex and dynamic process that necessitates a combination of theoretical foundations, practical strategies, and a comprehensive understanding of how students learn.

Creating a Supportive Learning Environment

A supportive learning environment is essential for cultivating a positive and inclusive classroom atmosphere. This involves establishing a space where students feel secure in taking risks, posing questions, and delving into mathematical concepts. Teachers can accomplish this by utilizing strategies such as:

Think-Pair-Share: This method encourages students to collaborate in pairs to solve mathematical problems and exchange their solutions with the class.

Number Talks: This technique entails discussing mathematical concepts and resolving problems collectively as a class, enhancing active engagement and communication among students.

Math Centers: This approach pertains to organizing various stations or centers in the classroom where students can engage in diverse mathematical activities, fostering hands-on learning and exploration.

The Concrete-Representational-Abstract (CRA) Framework

Concrete-Representational-Abstract (CRA) is a core framework for teaching mathematics that consists of introducing concepts using tangible objects, progressing to representational models, and ultimately, abstract symbols. This framework enables students to cultivate a profound understanding of mathematical concepts by linking abstract ideas to concrete experiences.

For instance, when instructing on addition, students can begin with counting blocks, advance to number lines, and finally utilize numerical equations. This gradual transition from concrete to abstract aids students in establishing a solid foundation in mathematics.

Differentiated Instruction

Differentiated instruction is vital for addressing various learning needs and abilities within the classroom. Teachers can implement different strategies, such as:

Choice Boards: This technique entails offering students a board or chart that presents various learning activities or tasks, allowing them to select the activities that best align with their learning style and capability.

Choice boards can be customized to specific learning objectives and may include a wide array of activities, such as:

- Completing a worksheet or practice exercise
- Creating a visual project or presentation
- Conducting an experiment or investigation
- Participating in a group discussion or debate

This strategy empowers students to take ownership of their education, progress at their own rate, and make selections that resonate with their interests and strengths.

Math Journals: This strategy includes having students keep a journal or notebook where they can document their thoughts, ideas, and solutions to mathematical challenges.

Students can utilize their journals to:

- Record their thinking and problem-solving processes
- Draw diagrams or illustrations to assist them in understanding mathematical concepts
- Write reflections on their learning and identify areas requiring further practice
- Create concept maps or vocabulary lists to aid them in organizing their thoughts

Resource-Based Learning: This strategy consists of supplying students with an assortment of resources and materials to improve their learning, such as:

- Manipulatives (e. g., Geo boards, base ten blocks, pattern blocks)
- Games and puzzles
- Real-world objects and materials (e. g., measuring cups, scales, geometry shapes)
- Printed or photocopied worksheets and activity sheets

This approach enables students to interact with mathematical ideas in a practical and engaging manner, even without technology.

Inquiry-Based Learning and Problem-Solving

Inquiry-based learning and problem-solving are essential elements of math education that focus on motivating students to explore, examine, and share their discoveries. Instructors can create open-ended tasks that encourage students to think critically, reason mathematically, and formulate problem-solving techniques.

For instance, while teaching geometry, students can engage in a "shape scavenger hunt," where they identify and describe different shapes found in their surroundings. This kind of inquiry-driven learning aids students in attaining a more profound comprehension of mathematical principles and enhances their critical thinking and problem-solving abilities.

Assessment and Feedback

Assessment and feedback are crucial aspects of successful math instruction that guide teaching and support student development. Educators can apply a variety of methods, including:

- **Formative assessments:** This method involves consistently evaluating student comprehension and development throughout a lesson or unit, offering feedback and modifying instruction as necessary.

- **Self-assessment:** This approach involves encouraging students to ponder their own learning and comprehension, recognizing both strengths and weaknesses.
- **Peer feedback:** This technique involves having students give support and feedback to one another, fostering collaboration and communication.

Technology Integration- Digital

Incorporating technology is another vital element of contemporary math education that can enrich teaching and learning. Instructors can employ digital instruments, such as math software, applications, and online materials, to:

- **Engage students:** Digital resources can offer interactive and immersive learning situations that capture students' attention and enhance motivation.
- **Promote interactive learning:** Digital tools can encourage active learning and investigation, allowing students to discover and experiment with mathematical ideas.
- **Provide real-time feedback:** Digital resources can deliver instant feedback and evaluations, assisting educators in pinpointing areas where students require further assistance.

Cultural Relevance and Responsiveness

Cultural relevance and responsiveness are significant factors in math education that involve recognizing and appreciating the varied backgrounds, experiences, and viewpoints of students. Educators can implement culturally responsive teaching methodologies, such as:

- **Incorporating real-world examples:** Instructors can use practical examples and applications to demonstrate mathematical concepts, making them more meaningful and understandable for students.
- **Using multicultural resources:** Teachers can utilize multicultural materials and resources to expose students to a variety of perspectives and experiences.
- **Promoting student voice and agency:** This is a powerful way to engage students in mathematics education, foster a sense of ownership and motivation, and develop essential skills for lifelong learning. By offering students opportunities to take charge of their learning, educators can help them develop into confident, self-directed, and mathematically literate individuals.

Conclusion

To summarize, effective math instruction necessitates a thorough and diversified approach that encompasses various strategies, techniques, and tools. By establishing a nurturing learning space, applying the CRA framework, customizing instruction, fostering inquiry-based learning, leveraging assessment and feedback, integrating technology, and encouraging cultural relevance and responsiveness, educators can cultivate deep understanding, inspire a passion for mathematics, and equip students for success in a more intricate and interconnected world.

The Features of a Dynamic Classroom: A Comprehensive Approach to Effective Teaching and Learning

Introduction

A dynamic classroom is a learning environment that is characterized by engagement, motivation, and a sense of community. It is a space where students feel valued, supported, and challenged to reach their full potential. In this essay, we will explore the features of a dynamic classroom and discuss how teachers can create such an environment to promote effective teaching and learning.

Student-Centered Learning

- **Personalized Learning:** Students have different learning styles, interests, and abilities. A dynamic classroom accommodates these differences by offering personalized learning experiences.
- **Inquiry-Based Learning:** Students are encouraged to explore, investigate, and discover concepts and ideas through hands-on activities and real-world applications.

Collaborative Learning

- **Teamwork and Communication:** Students work together in groups to complete tasks, projects, or activities, promoting teamwork, communication, and problem-solving skills.
- **Diverse Perspectives:** Collaborative learning allows students to share their ideas, perspectives, and experiences, creating a rich and diverse learning environment.
- **Peer Feedback and Support:** Students provide feedback and support to each other, promoting a sense of community and responsibility.

Technology Integration

- **Digital Tools and Resources:** Technology is used to support teaching and learning, enhance student engagement, and promote collaboration.
- **Online Learning Platforms:** Online platforms provide access to a wide range of resources, including online textbooks, educational apps, and multimedia content.
- **Virtual Field Trips and Guest Speakers:** Technology allows students to participate in virtual field trips and interact with guest speakers from around the world.
- **Case Studies:** Real life case scenarios integrating story sums in mathematics classes.

Flexible Learning Spaces

- **Learning Zones:** Teachers create different learning zones or areas, each with its own unique characteristics and features, to promote movement, collaboration, and creativity.

- **Outdoor Learning Spaces:** Outdoor learning spaces provide opportunities for hands-on learning, exploration, and discovery in a natural environment.

Real-World Applications

- **Project-Based Learning:** Students work on real-world projects that require them to apply what they have learned to solve problems and create solutions.
- **Industry Partnerships:** Schools partner with industries and organizations to provide students with opportunities to work on real-world projects and gain practical experience.
- **Service Learning:** Students participate in service-learning projects that require them to apply what they have learned to make a positive impact in their community.

Ongoing Assessment and Feedback

- **Formative Assessments:** Teachers use formative assessments to monitor student progress and understanding throughout the learning process.
- **Feedback and Self-Assessment:** Students receive regular feedback and are encouraged to reflect on their own learning, set goals, and identify areas for improvement.
- **Summative Assessments:** Teachers use summative assessments to evaluate student learning at the end of a lesson, unit, or semester.

Teacher Reflection and Professional Development

- **Reflective Practice:** Teachers reflect on their teaching practices, seeking ways to improve and innovate.
- **Professional Learning Communities:** Teachers participate in professional learning communities to share best practices, collaborate with colleagues, and learn from each other.
- **Workshops and Conferences:** Teachers attend workshops and conferences to stay up to date with best practices and new technologies.

Embracing Diversity and Inclusion

- A dynamic classroom values diversity and promotes inclusion.
- Teachers create a welcoming environment using diverse texts, images, and resources that reflect students' backgrounds and experiences.
- This helps students feel seen, heard, and valued, building trust, motivation, and a sense of belonging.

Fostering a Growth Mindset

- A dynamic classroom fosters a growth mindset.
- Teachers encourage students to view challenges as opportunities for growth and learning, rather than threats to their ego.

- Teachers praise effort, persistence, and progress, rather than just talent or ability, to help students develop a growth mindset.

Key Takeaways

- A dynamic classroom empowers students to take ownership of their learning, unleash their creativity, and reach their full potential.
- Educators can create a learning ecosystem that fosters academic excellence, social growth, and emotional well-being by embracing the features of a dynamic classroom.

Creating a Sustainable Learning Environment

- A dynamic classroom is a sustainable learning environment that promotes long-term growth and development.
- Teachers can create a sustainable learning environment by establishing clear routines, providing opportunities for student reflection, and encouraging ongoing feedback and assessment.
- By creating a sustainable learning environment, educators can help students develop the skills and habits necessary to succeed in an ever-changing world.

Review and Assess Exercises

- **Regular Review:** Regular review and assess exercises help students reinforce their understanding of key concepts, identify areas for improvement, and develop problem-solving skills.
- **Adjusting Instruction:** By regularly reviewing and assessing student progress, teachers can adjust their instruction to meet the diverse needs of their students.

A dynamic classroom is a transformative environment that empowers students to take ownership of their learning, unleash their creativity, and reach their full potential. By embracing the features outlined in this essay, educators can create a learning ecosystem that fosters academic excellence, social growth, and emotional well-being.

Table of Content

Unit 1 Whole Numbers

Learning Framework

Pupils will now learn to identify numbers from 1 to 9 and read them out loud.

This skill relies heavily on photographic memory, so it's essential to display the numbers prominently throughout the learning process. This can be achieved by displaying digits from 1 to 9 in different colors on cards, chart paper, or the board. To introduce this topic, start with a hands-on activity using simple materials like ice cream sticks, wooden or plastic sticks, or card stripes. Prepare five envelopes with different numbers of sticks or stripes between 1 and 10, and have pupils take turns counting the contents. Ask them to point out where the corresponding number is displayed in the classroom.

Pupils will learn to identify the number of objects using digits from 1 to 9.

This skill depends on their ability to identify objects based on their characteristics and recall the symbol of the number that quantifies the objects. Ensure that digits from 1 to 9 remain on display throughout the lesson. Pupils will then learn to identify the number of objects using digits from 1 to 9 and write the numbers in words. This skill builds upon their ability to identify objects and count them and requires them to recall the spelling of the number in words.

The next step is for pupils to count given objects and identify the same number in a provided list.

This task requires them to understand numbers and recall the shape of the number in their minds. The presence of numerals from 1 to 9 on display will support pupils in this task. Pupils will then learn to count objects, find the correct number in a list of three, and encircle it. This task is an extension of the previous skill and requires pupils to apply their knowledge of numbers.

At this level, pupils will apply their knowledge of numbers from 1 to 9 to find the missing number in each sequence, identify a number before or after a given number, and write them. Pupils will then learn to count ZERO, its relevance to the real world, its numerical symbol, and its pronunciation with correct spelling. Start with a hands-on activity using the same materials as before, but this time leave one envelope empty. Ask pupils to count the contents, and when they encounter the empty envelope, introduce the concept of ZERO.

Pupils will learn to identify and list numbers from 11 to 20 and read them out loud.

Give them more than 10 sticks to count, and when they reach 10, make a bundle and write the outcome as 1 and the remaining sticks as the next number. Pupils will then learn to identify, read, and write multiples of 10. Make bundles of 10 sticks with rubber bands and ask pupils to count the bundles and the sticks within them.

The next step is for pupils to write forward numbers from 1 to 100 and backward numbers from 100 to 1 in groups of tens.

Help them write numbers from 1 to 10, then 11 to 20, and so on, until they reach 100. Pupils will then learn to write numbers using place values TENS and ONES and identify tens and ones in given numbers. They have already learned to read numbers more than 10 and count multiples of 10, so they can easily grasp this concept.

Pupils will learn to write numbers from 1 to 100

Ask them questions like "What comes before 2?" or "What comes between 13 and 15?" to help them fill in the grid. Pupils will then learn to write numbers backward from 100 to 1 with the help of given numbers in a Square Grid. Ask them questions like "What comes before 1?" or "What comes between 87 and 85?" to help them fill in the grid.

At this level, pupils will apply their knowledge of numbers from 1 to 100 to find the missing number in a given sequence, identify a number before or after a given number, and write them. Pupils will then learn to compare two numbers by counting them and decide which one is bigger and which one is smaller. They will also learn to write given random numbers in ascending and descending order.

Pupils will learn to compare two given quantities by counting them

Start with a simple activity using two bundles of sticks with approximately equal numbers of sticks. Finally, pupils will learn to identify, list, and read the position of an object using ordinal numbers. Make ten pupils stand in a row and mark the child who is first in the row. Ask pupils to call their position number one by one, and then ask questions like "Who is first and last in the row?" or "What is the position number of the last pupil in the row?"

Lesson Plan

Suggested Time: 3 periods

Objectives:

To enable students to:

- read and write numbers up to 99 in numerals and in words.
- count objects and numbers up to and across 99 (2-digit numbers) forward and backwards, beginning from zero, one, or from any given number.
- recognise the place value of each digit in 2-digit numbers (tens, ones/units).
- identify and write missing numbers in a sequence from 1 to 100.

Concept Connector:

Counting is the process of finding the number of objects in a set, one by one. Using counters, as manipulatives, is an effective way to help students learn counting, as it provides a hands-on and visual representation of numbers. By moving counters one by one, students can develop a strong sense of one-to-one correspondence.

Exploring the Objective:

Using the exercises of counting objects on ***Pages 2*** of the textbook, explain to the students how counting can be done by appointing a number to each object in a set to determine the total quantity or amount. Using ***Math Lab 1 Page 1, 2, 7*** can be used to further develop the concept of counting using objects using numerals and words. The exercise of ***Page 3*** can further be used to reinforce identifying, counting and writing numbers in a sequence.

The concept of ***Place Value on Page 5*** of the textbook can be used to help students understand the value of a digit in a number, depending on its position. This concept lays the foundation of recognising large numbers and introduces 2-digit numbers as tens and ones. Different manipulatives, such as bundles of 10 pencils as tens and individual pencils as one, can be used to explain the concept. Students can use ***Pages 8-11*** of the textbook and ***Math Lab Pages 17 and 18*** as support to further cement the practice of recognising the place value of 2-digit numbers.

Activity

Number Train

What you need:

- Number cards (1-99)
- Train-themed pictures or props (e.g., train cars, conductor hat)
- Whiteboard or chart paper
- Markers or colored pencils

How to play:

- Divide the class into small groups of 3-4 students.
- Create multiple number tracks on the board or chart paper with blank tracks for students to fill.
- The number tracks must have 10-20 tracks (For example, 34, _____,_____, _____, 38, _____, ...).
- Give each group a set of number cards (1-99).
- Allow each group to take turns picking a number card and reading it aloud.
- The group will have to find the corresponding tracks on the whiteboard or chart
- Paper and write the number on it. The group must also recongnise the place value of each digit (tens, units).
- The game continues until all tracks are filled with numbers in a sequence.

Reflection:

- Students develop their understanding of numbers up to 99 and place value.
- Assess students' ability to read and write numbers correctly.

Exercise:

To reinforce students' understanding of counting, assign ***Page 1*** as in to be completed together with teacher guidance. For an easy-level individual assignment, have students complete the car track on ***Page 2***. To build on their understanding of place value, review the explanation on ***Page 5*** and then have students attempt ***Page 10*** in class, which offers medium to hard-level questions. Finally, assign ***Page 7*** as individual homework to consolidate learning and provide additional practice. Use ***Math Quest on Page 11*** as a reinforcement of the concepts they have learnt so far in the class.

Extension Activity:

The following questions can be given as added practice, worksheet or as reinforcement of the topic.

1. Write the number 87 in words
2. Write the missing numbers 43, 44, __46, __, __49, __.
3. Write the number 64 in words and identify the tens and units.
4. What is the value of the 5 in the number 56?

Activity Sheet

Unit 1 Whole Numbers

Learning Objective:

- Recognize the place value of a specific digit in 2-digit numbers (tens and ones).
- Identify the place value of the specific digit in a 2-digit number.

Let's Talk Maths:

Explain to students how as a teacher you carry out a head count at every stop when going on a field trip so that you would know if someone was missing.

Make Sure You Have:

- Numeral cards
- Word card

Zero	One	0	1
Two	Three	2	3
Four	Five	4	5
Six	Seven	6	7
Eight	Nine	8	9

Activity: Number Match Dash

Duration: 1 Lesson **Whole Class Activity**

Let's Try It:

- Distribute numeral and word cards for numbers 0-9 to each pupil.
- Ensure each numeral card has a corresponding word card.
- Place the cards face down on each pupil's desk.
- On go pupils turn their card and find their match
- As a team, they must gather that number of objects (e.g., books, stationery). • Provide examples of objects they can collect beforehand.
- Once complete, ask pupils to line up in numerical order in front of you. • First in ascending order.
- Then in descending order.
- Explain that pupils with the same number should stand together in the same place in the line.

Assessment:

- Find 10 objects in class that are under 10 for e.g. Desks, bulletin boards, even walls. • Tell the students to write down the number in words and numerals as you read out the objects.
- Check their work at the end.

Activity 2

Learning Objective:

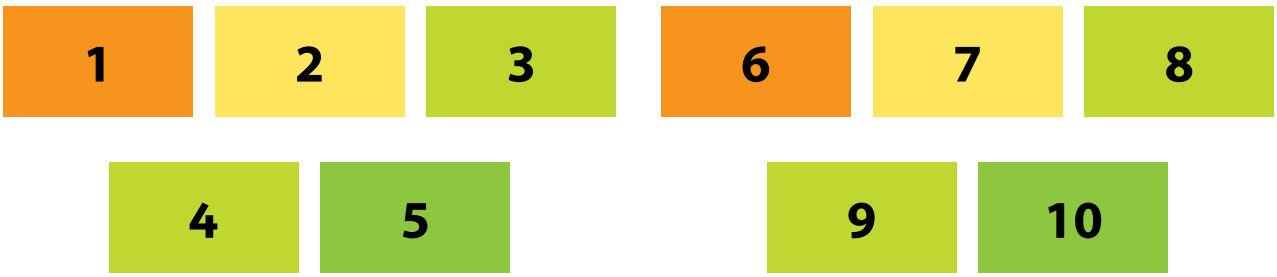
Pupils will be able to identify, read and write whole numbers.

Let's talk math:

- Ask the pupil why it is important to be able to count.
- Does counting help in their daily lives.

Make Sure You Have:

- Colorful Dot Cards
- Whiteboard
- Marker



Activity: Fun with Dot Cards

Duration: 1 Lesson **Whole class activity**

Let's Try It:

- Write numbers on the board in fun colors.
- Read the numbers in a rhythmic chant and have the pupils repeat after you.
- Show a dot card and ask the class to collectively figure out the number of dots.
- To give more clarity to the pupils, convert the activity into a counting song where the class counts the dots out loud together using the number on the board as references.

Assessment:

Assess pupils learning by showing a number card and asking students to write the number on their whiteboard and show it to the class/teacher.

Name: _____

Date : _____

Counting Squares

Tens	Ones	Tens	Ones

The strips on the left represent **tens** and those on the right represent **ones**. Have the students roll 2 dice. Suppose they roll a 4 and a 6; this makes a 46 or 64. Tell them to place counters on the strips accordingly.	*Numbers up to 100*

Note: Base ten blocks can be used to conduct place value activity.

Name: _____

Date : _____

Ordering Numbers

62 71 60

69 66 78

72 63 80

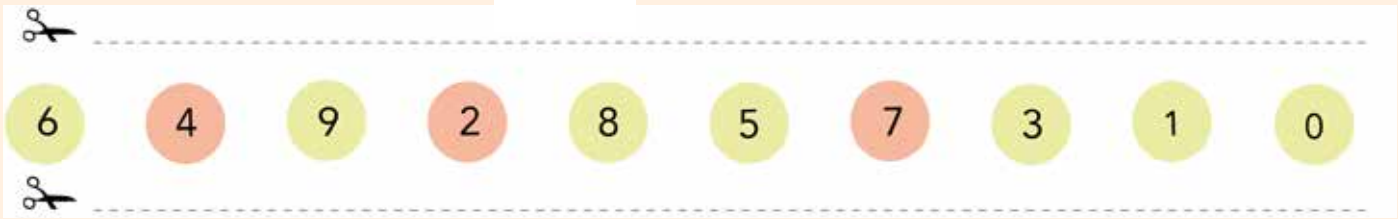
76 64 74

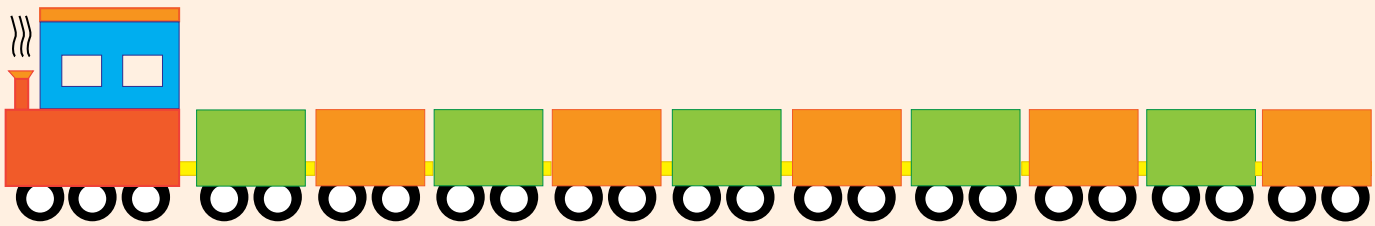
Arrange these numbers in **ascending order**. Then place in the appropriate **missing numbers** to complete a number line from 60 to 80.	*Numbers up to 100*

Name: _____

Date : _____

Ordering Numbers 9-0





Cut out the numbers. Ask the pupils to paste the numbers on the train in the correct order. Get each pupil to paste the completed train on a piece of paper.	*Numbers 0 to 9*

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Name: _____

Date : _____

Ordinal Number Cards

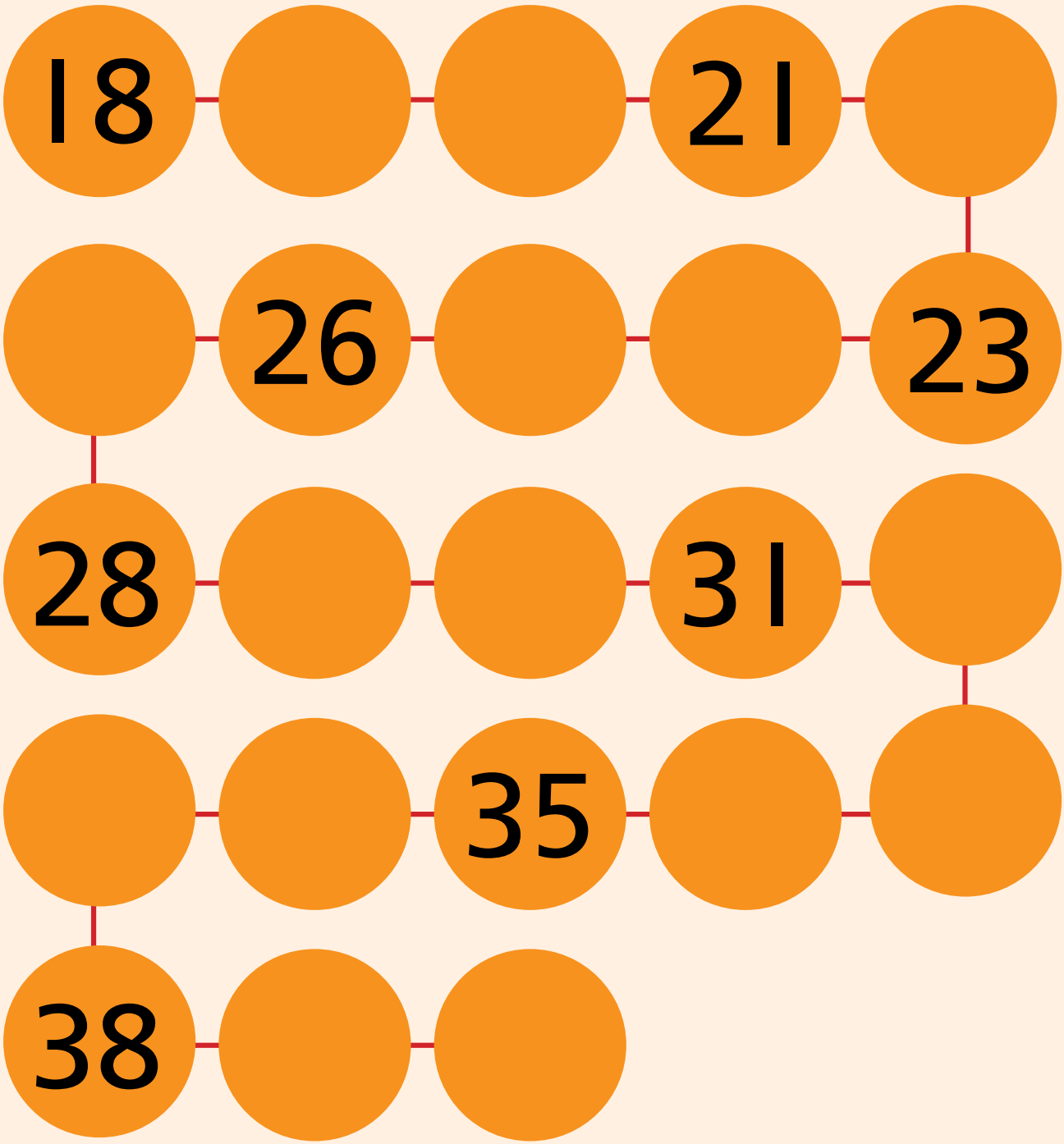
1st	2nd
3rd	4th
5th	6th
7th	8th
9th	10th

Make 10 students compete in a shoe tying race. Once they are done, help the students to stand in **order of their position** in the race, and assign ordinal numbers accordingly.	*Numbers up to 100*

Name: _____

Date : _____

Missing Numbers



Fill in the beads with the **missing values** to complete the pattern.	*Numbers up to 100*

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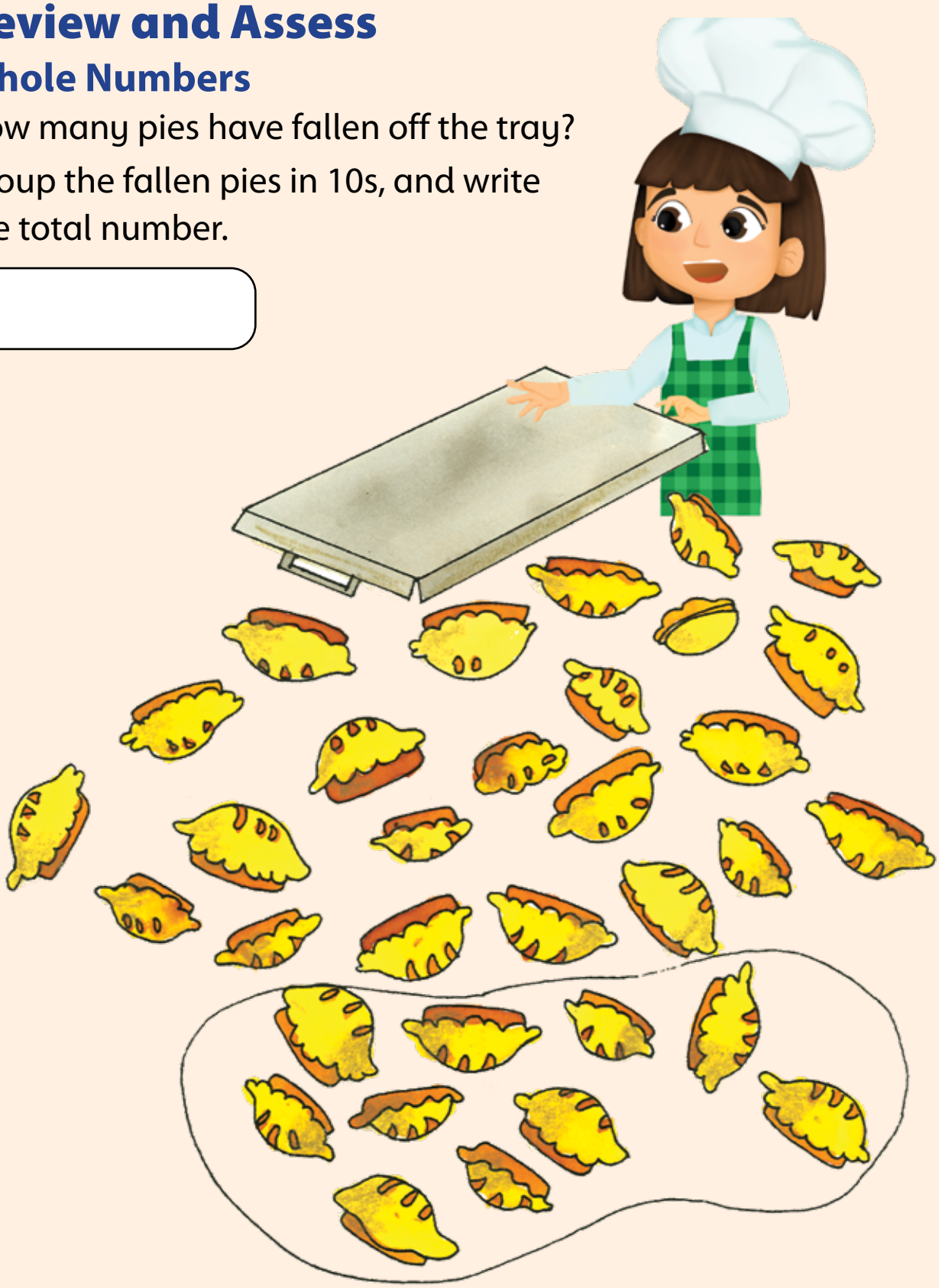
Review and Assess

Whole Numbers

How many pies have fallen off the tray?

Group the fallen pies in 10s, and write the total number.



What comes after?

1		
14		
23		
38		
47		
55		
69		
70		

What comes before?

		12
		29
		35
		40
		54
		69
		80
		97

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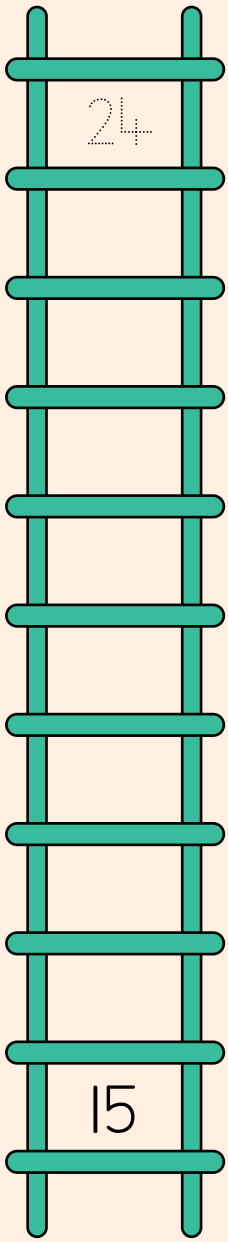
What comes in between?

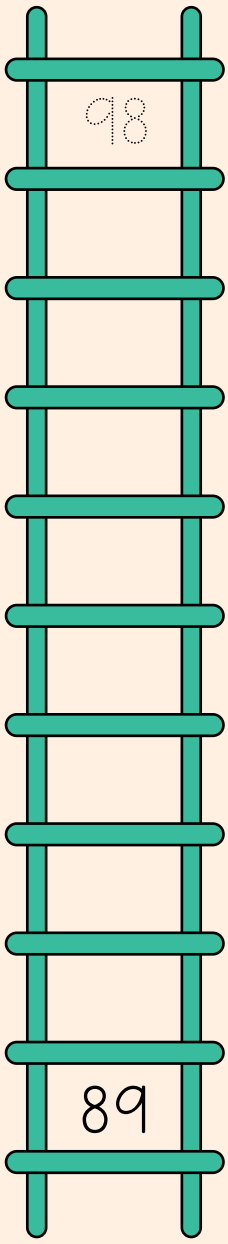
11		13
27		29
34		36
49		51
58		60
63		65
76		78
82		84

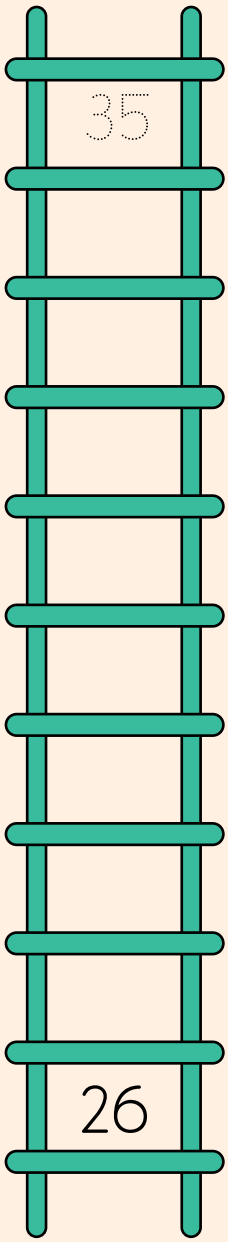
Compare numbers and write < or >.

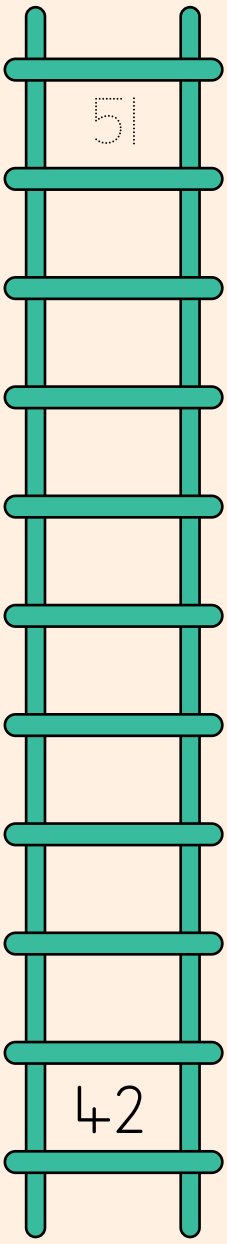
9	<	11	73		76
18		15	62		61
20		10	87		82
48		59	56		66
30		40	100		99

Beginning at the bottom of each ladder, fill the spaces by writing numbers in an ascending order.

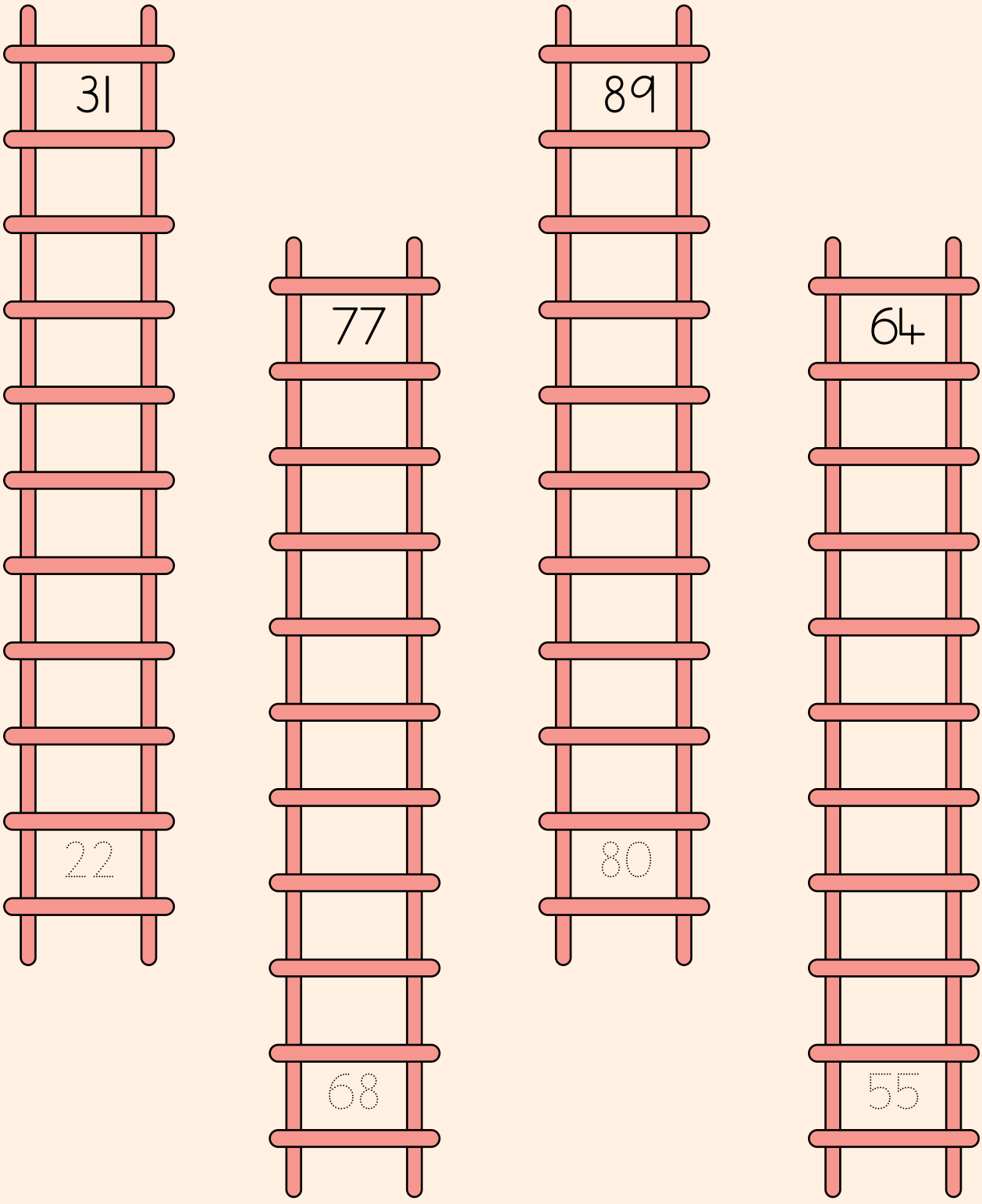








Beginning at the top of each ladder, fill the spaces by writing numbers in descending order.



Look at the clowns.

Choose the correct word for each blank.

hands	stars	longest	turned	flower
down	sitting	one	polka dots	back

The 1st clown has _____ on his dress.

The 2nd clown is standing on his _____.

The 3rd clown has _____ around.

The 4th clown has _____ on his dress.

The 5th clown is upside _____.

The 6th clown has his hands behind his _____.

The 7th clown has the _____ hat.

The 8th clown has _____ leg up.

The 9th clown is _____.

The 10th clown has a _____ in his hand.

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Whole Numbers

How many pies have fallen off the tray?

Group the fallen pies in 10s, and write the total number.

30

What comes after?

1	2	3
14	15	16
23	24	25
38	39	40
47	48	49
55	56	57
69	70	71
70	71	72

What comes before?

10	11	12
27	28	29
33	34	35
38	39	40
52	53	54
67	68	69
78	79	80
95	96	97

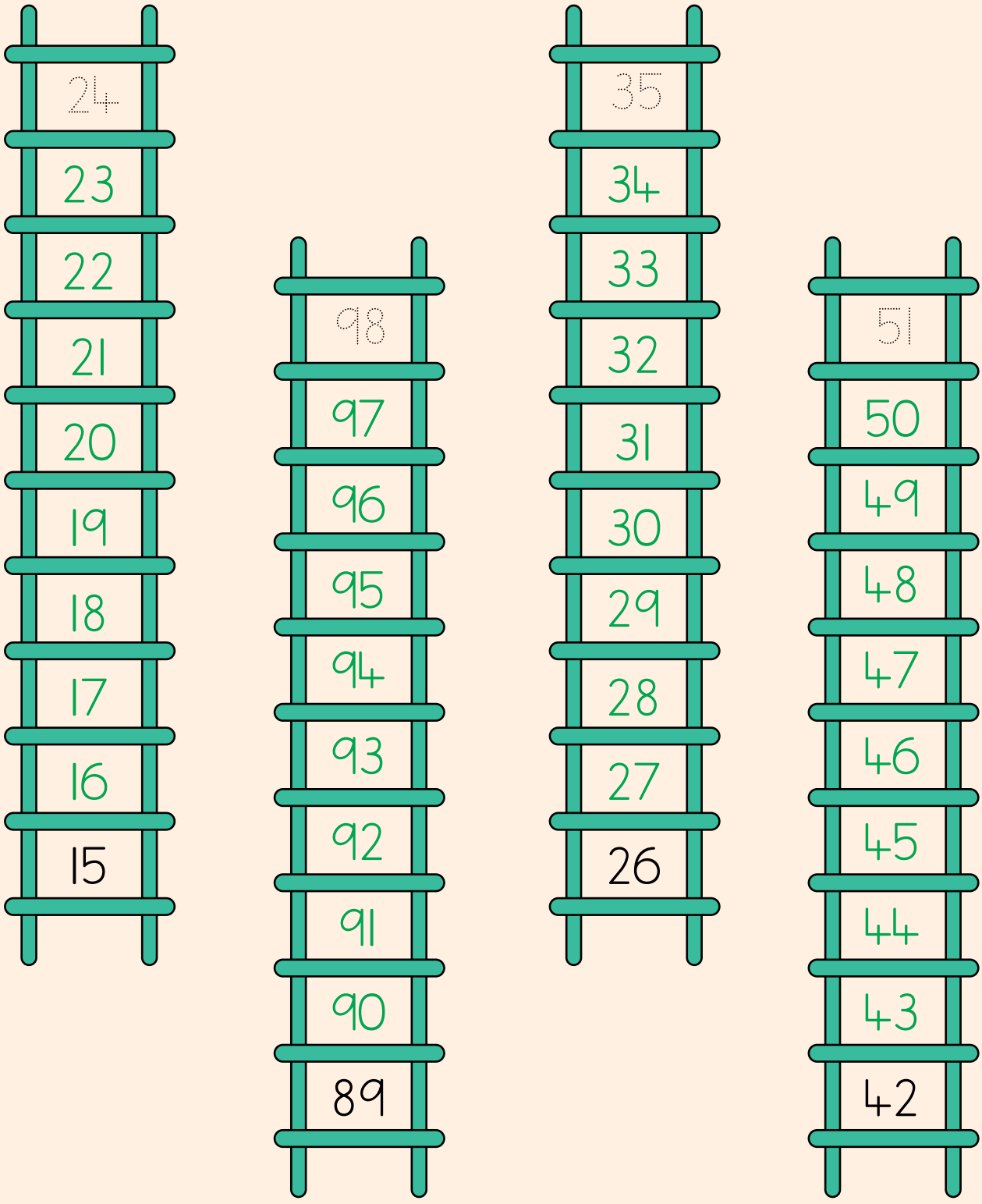
What comes in between?

11	12	13
27	26	29
34	35	36
49	48	51
58	59	60
63	64	65
76	77	78
82	83	84

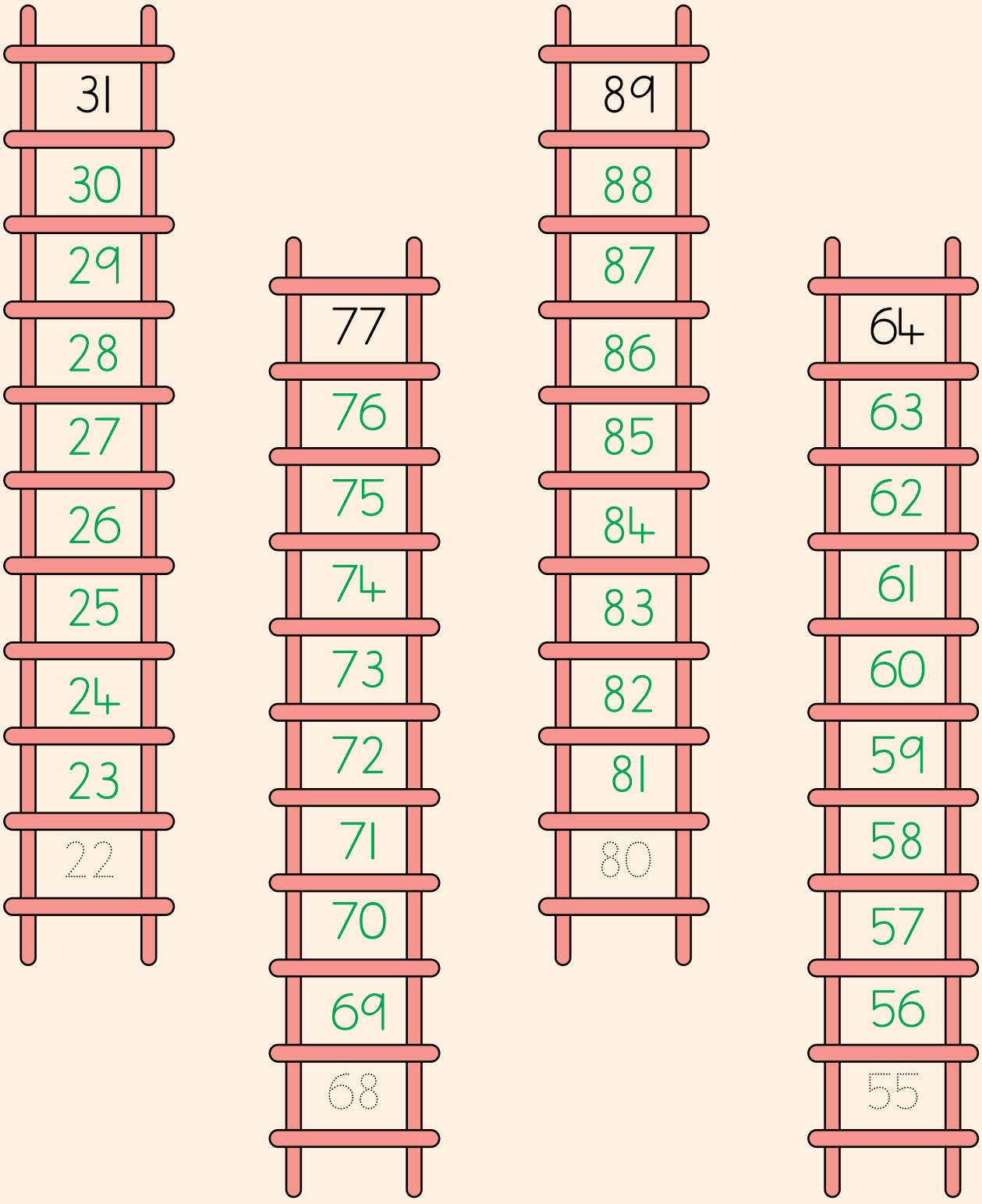
Compare numbers and write < or >.

9	<	11	73	<	76
18	>	15	62	>	61
20	>	10	87	>	82
48	<	59	56	<	66
30	<	40	100	>	99

Beginning at the bottom of each ladder, fill the spaces by writing numbers in an ascending order.



Beginning at the top of each ladder, fill the spaces by writing numbers in descending order.



Look at the clowns.

Choose the correct word for each blank.

hands	stars	longest	turned	flower
down	sitting	one	polka dots	back

The 1st clown has _____stars_____ on his dress.

The 2nd clown is standing on his _____hands_____.

The 3rd clown has _____turned_____ around.

The 4th clown has _____polka dots_____ on his dress.

The 5th clown is upside _____down_____.

The 6th clown has his hands behind his _____back_____.

The 7th clown has the _____longest_____ hat.

The 8th clown has _____one_____ leg up.

The 9th clown is _____sitting_____.

The 10th clown has a _____flower_____ in his hand.

Unit

2 Number Operations: Addition and Subtraction

Learning Framework

Pupils will learn to compare two numbers and their difference to show how much the first number is more than the second number.

To start, draw a number line on the board showing numbers from 1 to 20. Ask one child to choose a number between 1 and 20 and write that number on the board. Then, ask another child to choose a number between 1 and 20 that is more than the last chosen number. Ask the class how much more the larger number is than the smaller one and how much less the smaller number is than the bigger one. Explain to the pupils how to use the number line to count from the smaller number to the larger number and find the difference between them.

Pupils will learn to count given objects and add numbers horizontally as well as vertically.

Pupils have already developed the skills to count given objects, and now they need to learn the concept and symbol of addition. It's essential to explain that when nothing is added, there will be no change in the original number, such as adding zero to a number. Pupils will also learn to find the number that, when added to a given number, will result in 10, 20, or any other number. A simple way to demonstrate this is by using fingers to count to 10. Let the pupils count from 1 to 10 on their fingers. To find what number will make 10 when added to 4, have pupils start counting on their fingers after four until they reach 10. Then, count the fingers to find the number that, when added to 4, will make 10. This method can also be used to find sums to 20 and other numbers.

Pupils will learn to add or subtract given numbers using place values of Tens and Ones.

By now, pupils have learned how to add and subtract given numbers without carrying and borrowing. Now, they need to learn that while doing addition or subtraction, digits of Tens are added or subtracted together, while digits of Ones are added or subtracted together. Pupils will also compare two numbers and their difference to show how much the first number is less than the second number. This skill can be elaborated using the same method described earlier.

Pupils will apply addition and subtraction to daily life problems and find simple solutions.

To demonstrate this, use sticks to show addition and subtraction practically. Constructing word problems, such as "There were 36 sticks on the table. 21 sticks were given to a child, how many are left on the table?" Make sure the problem is explained clearly with simple words and their mathematical alternatives are listed prominently. Pupils will also learn to use pictorial forms of objects to subtract a smaller number from a greater number. While adding two quantities,

it's convenient that both quantities exist and can be seen in the sum. However, while finding the difference, the quantity being subtracted is non-existent. It simply tells how much has to be removed from the first quantity.

Pupils will find the missing number in a subtraction problem and identify the symbols of addition and subtraction.

They will perform the functions accordingly. While doing subtraction, pupils should master the skill by finding the number subtracted when the result of subtraction is given.

Lesson Plan

Suggested Time: 4 periods

Objectives:

To enable students to:

- solve real-world word problems with addition and subtraction using concrete objects and pictorial representations.

Concept Connector:

Building on what the students have learned about counting, link addition to counting things together. Numbers and counting to help add two sets of things to make a bigger set. Unlike addition, subtraction is finding out how many objects or numbers are left after taking away some. It is like counting backwards. Use ***Concept Connector on Page 28*** to let the students know how a number gets bigger when we add and small when we subtract.

Exploring the Objective:

Addition combines two or more quantities to get a total or a whole. The students must already have done simpler addition sums on ***Pages 22-25*** of the textbook. Similarly, subtraction, on the other hand, involves finding the difference between two quantities. Like addition, the students must have already done simpler subtraction problems on ***Pages 28-31***. Using the solved example on Page 26 and 32, explain to the students that real-life word problems are mathematical problems that are presented in words. Emphasise on finding the key information within the text of the question and then solving it.

Solving word problems involving addition and subtraction can help students connect math to real-life scenarios and build problem-solving skills. ***Math Lab Page 29*** can be used as a class activity to solidify the concept of solving real-life number stories. Furthermore, the ***QR sheet activity on Page 33*** is a fun game that involves addition and subtraction questions.

Activity

Math Storytelling

What you need:

- Flash cards with different word problems
- Concrete objects relating to the word problems, such as pencils, buttons, marbles, etc
- Blank paper and pencils

How to Play:

- Divide the students into pairs or small groups.
- Give each group a word problem card.

- Ask them to read the problem, identify the key information, and use concrete objects to solve it.
- Similarly, provide students with different manipulatives and ask them to make number stories and solve them.
- Ask the students to share their number stories in class and have them discuss different ways of solving them.

Reflection:

- Students develop the skills of solving real-world word problems.
- Students learn to work collaboratively in class, communicate math thinking and problem-solving strategies through storytelling.

Exercise:

Using the exercise on ***Page 22*** of the textbook, including ***Math Lab Pages 23-24,*** students can revise the concept of addition making it easier for them to solve questions regarding addition word problems on ***Page 26-27***. To reinforce understanding, assign students word problems on ***Page 26 and 27*** for class work. For additional practice, assign the medium-hard level questions on ***Page 27*** as individual homework.

To teach subtraction word problems, follow the same approach as before. Review the concept of subtraction using the examples and exercises on ***Pages 28-29.*** Then, use the real-life word problems on ***Pages 32 and 33*** for in-class practice, and assign the last two questions on ***Page 33*** as homework.

Extension Activity:

The following questions can be given as added practice, worksheet or as reinforcement of the topic.

1. Sophia has 4 stickers in her sticker book. She bought a new sticker sheet with 6 stickers. How many stickers does Sophia have now?
2. The bookshelf has 75 books on it. If 12 books are removed, how many books are left on the bookshelf?
3. A bakery has 47 cupcakes on display. They sell 34 cupcakes to a customer. How many cupcakes are left in the bakery?

Unit 2 Number Operations: Addition and Subtraction

Subtraction

Learning Objective:

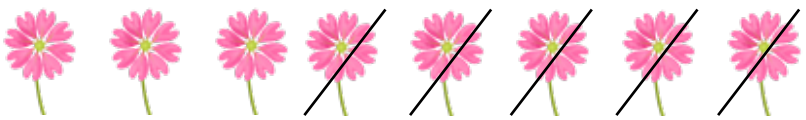
- Recognise subtraction as a difference and take away and use the symbol "- ".
- Subtract 1-digit number from 1 digit number

Let's talk math:

- Ask students how they would use subtraction in their daily life

Make Sure You Have:

- Chalk
- Blackboard



8 – 5

$$\begin{array}{r} 8 \\ -\ 5 \\ \hline \\ \hline \end{array}$$

Activity: Sign Swap

Duration: 1 Lesson

Whole Class Activity

Let's Try It:

- Write numbers on the board without any plus or minus signs, for example:
- 15 □ 5 = 20
- Ask pupils to vote by raising their hands for either an addition or subtraction sign to complete the equation.
- Encourage discussion and reasoning behind their choices.
- Gradually introduce more complex numbers while staying within the limit of two-digit numbers.
- Explain that addition represents an increase, while subtraction represents a decrease in the total.
- Ask pupils to rearrange the completed equations, for example:
- 4 + 8 = 12 becomes 12 - 8 = 4 or 12 - 4 = 8.
- Pupils will understand the relationship between addition and subtraction by rearranging equations.

Assessment:

- Ask pupils to tell you real life examples where they used addition or subtraction.
- Show them how to subtract on their fingers, by counting backwards, but call it taking away.

Addition

Learning Objective:

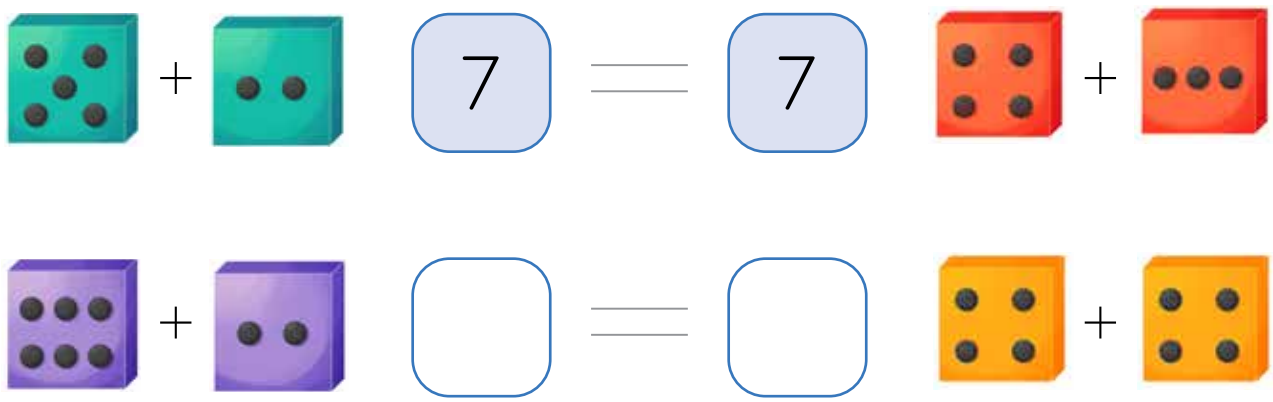
- Familiarise pupils with addition and number pairs summing to a specific total
- Recognise and use symbols of addition "+" and equality "=".
- Add two 1-digit numbers sum up to 9.
- Add a 2-digit number to a 1-digit number.
- Compare numbers from 1 to 20 and find "how many less".

Let's talk math:

- Ask pupils how they would use addition in their daily lives.

Make Sure You Have:

- Objects around the school for counting.



Activity: Addition Challenge

Duration: 1 lesson **Whole class activity**

Let's Try It:

- Set up two groups of objects and have pupils count each group.
- Ask pupils to find the total number of objects and how many are in the larger group.
- From groups of 3-4 pupils give each group 20 objects.
- Each group creates three pairs of numbers that sum to 20.
- Write their pairs on the board (e.g., 13+7=20) to familiarize them with addition symbols.
- Start with single-digit numbers then gradually introduce two-digit numbers.

Assessment:

- Assign up to ten sums that contain a 2-digit number.
- Ask the pupils to write down the completed sums in their notebooks.

Name: _____

Date : _____

Addition

☐	+	☐	=	20
☐	+	☐	=	16
☐	+	☐	=	9
☐	+	☐	=	13
☐	+	☐	=	19

Fill in the missing values by using **different combinations** for the number in the coloured box.	*Addition*

Note: Linking cubes can be used to make number stories.

Name: _____

Date : _____

Before, After, and Between Numbers

Tell students to pick a number between **1-99**, and **write in coloured box** to demonstrate the position of numbers. Ask them to write the numbers before, after, and / or between.	*Numbers up to 100*

Name: _____

Date : _____

Addition Equation Cards

23 + 16 =	22 + 25 =
6 + 12 =	25 + 12 =
14 + 8 =	37 + 9 =
27 + 9 =	

Once all the **sums** have been solved, arrange the answers in **ascending order**.	*Addition*

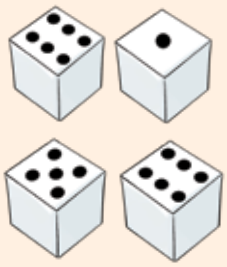
Note: Linking cubes or cuisenaire rods can also be used for this activity.

Name: _____

Date : _____

Number Stories for Addition and Subtraction

Ali and Zia roll two dice each.



Ali rolls 6 and 1, and Zia rolls 5 and 6.

What is the score of Ali? _____ + _____ = _____

What is the score of Zia? _____ + _____ = _____

Who scored more? _____

How many more? _____ – _____ = _____

There are 3 birds on the house.

3 more birds are coming.

How many birds altogether?

_____ + _____ = _____

_____ birds altogether

Give the students more stories based on real-life situations.	*Addition*

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Name: _____

Date : _____

Subtraction Equations

20	−	10	=	
20	−		=	15
	−	12	=	8
8	−		=	8

Fill in the missing values, and then use the given image to write your own real-life story sum for your partner to solve.	*Subtraction*

Note: Cuisenaire rods can be used to conduct the activity.

Name: _____

Date : _____

Adding and Subtracting Tens

$5 + 10 =$ ◯

$13 + 10 =$ ◯

$22 + 10 =$ ◯

$18 - 10 =$ ◯

$19 + 10 =$ ◯

$45 + 10 =$ ◯

$20 - 10 =$ ◯

$33 - 10 =$ ◯

Use beads and ask the students to reflect the sums above.	*Addition* *Subtraction*

Note: Dominos/cuisenaire rods can be used to perform the activity.

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Number Operations: Addition and Subtraction

Find the sum.

23 + 4 =	38 + 1 =	42 + 6 =	55 + 22 =
66 + 30 =	42 + 45 =	87 + 12 =	72 + 15 =

Subtract the following.

12 − 2 =	23 − 3 =	39 − 8 =	44 − 23 =
60 − 40 =	76 − 34 =	83 − 51 =	99 − 40 =

Number Operations: Addition and Subtraction

Find the sum.

23 + 4 = 27	38 + 1 = 39	42 + 6 = 48	55 + 22 = 77
66 + 30 = 96	42 + 45 = 87	87 + 12 = 99	72 + 15 = 87

Subtract the following.

12 − 2 = 10	23 − 3 = 20	39 − 8 = 31	44 − 23 = 21
60 − 40 = 20	76 − 34 = 42	83 − 51 = 32	99 − 40 = 59

Unit

3 Number Operations: Multiplication and Division

Learning Framework

- **Pupils will learn to add repeated similar numbers and the shortened form of repeated addition i.e., multiplication.**
- **Pupils will learn to use the 'times tables' to carry out multiplication of two numbers from 1 – 10 and use the same skill to solve word problems.**

It requires a long jump to conceptually reach multiplication from addition. Make five bundles, each containing three sticks. Put these bundles on a table and ask your students to count them. This activity may take some time but do it patiently. When they have counted the total number of sticks, ask the how did they got this result. Show them to add 3 five times as 3 + 3 + 3 + 3 + 3 = 15. Now show them repeated addition can be simply written in the form of 'times' as 5 times 3 = 15. Then show them the sign of 'times' i.e., '×'. Now show them to write 5 × 3 = 15.

Pupils will apply the concepts of multiplication to daily-life problems to find their solution.

While doing word problems, make sure that pupils are not stuck at the barrier of language. Ask them to read the problem multiple times, ask them what they comprehended. Write problems on board, show the mathematical alternative of each word and phrase. Let them identify the required process. Show them one sample solution on board and keep it there for guidance.

- **Pupils will learn successive subtraction means subtracted the same number as many times till the remainder is zero.**
- **They will learn how to put a given number of objects in groups of equal number of objects.**

Division is a multifaceted function to interpret. Let you have a certain number of wooden sticks, and you want to group them. If you know the required number of groups, then by division you can find how many sticks will be there in each group. If you know the required number of groups, then you can find how many sticks will be there in each group. This activity may take some time but will make things crystal clear to students. Through this activity, each meaning of division can be demonstrated. Take a pile of 24 sticks and put them in a corner on the table. Ask your class how many times successively 6 sticks can be subtracted from 24 sticks? Take 6 sticks from the pile and put them on the side. Repeat the process to make different piles of 6 sticks on the table. When the original pile is finished, count the piles of 6 sticks. There will be 4 piles of 6 sticks. Now show this process on board as

24 – 6 = 18 ---------- 1st

18 – 6 = 12 ---------- 2nd

12 – 6 = 6 ---------- 3rd

6 – 6 = 0 ---------- 4th

In other words, we can make 4 groups of 6 sticks out of 24 sticks. Now introduce the sign of division as

24 sticks = 4 groups

Now restart the same activity with the question, 'How many groups will be formed if 3 sticks are put in each group?' Take out 3 sticks from the pile of 24 and put them on the side. Repeat the process tile the pile of 24 sticks is completely consumed. Now count how many groups of 3 sticks are formed?

24 sticks = 8 groups

Now restart the same activity with the question, how many sticks will be there in each group if we make 6 groups of 24 sticks?' Put 6 tables or chairs in front of the classroom. Put one stick on each table. Repeat the process till all 24 sticks are consumed. Now count sticks on each table separately, each table will have 4 sticks as 24 sticks = 4 sticks.

Lesson Plan

Suggested Time: 3 periods

Objectives:

To enable students to:

- count and write in 2s, 5s, and 10s using concrete objects and pictorial representation.
- recognise multiplication as repeated addition using concrete objects and pictorial representations.
- recognise using concrete objects and pictorial representations that the multiplication of any two numbers can be done in any order.

Concept Connector:

Building on their prior knowledge of addition, students can now explore the concept of multiplication as a faster method of repeated addition, where the same amount is added multiple times.

Exploring the Objective:

Using the information box on ***Page 35,*** explain to the students that multiplication is the process of repeatedly adding the same number to a group. Before students learn how to multiply objects, they need to understand the concept of skip counting. Using the example of skip counting on ***Page 35*** of the textbook demonstrates to the students how skip counting is done to lay the basis of multiplication tables. Different manipulative, such as blocks, buttons, or counters can be used to represent skip counting.

Once the concept of skip counting is concrete, introduce the symbol of multiplication and how it is represents 'multiplied by' or 'times. Use exercises on ***Pages 36-38*** to help students develop the multiplication tables on their own. For 2s, socks or cherries can be used, for 5s fingers on a hand can be used, and for 10 a bundle of 10 pencils can be used to demonstrate multiplication.

Using multiplication arrays or counters, explain the examples on ***Page 41 to*** recognise that multiplication of two numbers can be done in any order. Use ***Maths Quest on Pages 40 and 42*** as a brain teaser for students.

Activity

Multiplication Masters

What you need:

- Concrete objects, such as counters or blocks
- Pictorial representations, such as number lines or hundreds charts
- Multiplication charts or tables
- Dice

How to Play:

- Review the concept of repeated addition and how it relates to multiplication.
- Divide the class into small groups and give each group a set of dice.
- Have each group take turns rolling the dice and multiplying the numbers together.
- The group with the correct answer earns a point.
- Once the students can easily repeatedly add, distribute a worksheet, which includes multiplication word problems and have the student work individually to complete it.

Reflection:

- Students understand the concept of multiplication as repeated addition, develop multiplication tables, and can use it to multiply two numbers
- Students recognise that multiplication of two numbers can be done in any order.

Exercise:

The number charts on ***Pages 36-38*** can also be used as a fun activity for students to do skip counting. Following skip counting, the students can easily develop multiplication tables of 2, 5 and 10. While developing multiplication tables, point out that any number multiplied by 1 is the number itself and any number multiplied by 0 is 0.

Use pictorial exercise on ***Pages 39-40*** to practise repeated addition of numbers. This activity will help students multiply numbers on their own and conduct exercise on ***Pages 41 and 42.*** To reinforce understanding, assign students questions on ***Page 41 and 42*** as guided practice and individual assessment for in-class work. For additional practice, assign the a few questions from ***Page 42*** as individual homework. Use ***Math Quest on Pages 40 and 42*** as a between-lesson brain teaser.

Extension Activity:

1. 10 x 2 = ?
2. A farmer has 5 baskets of strawberries, and each basket contains 6 strawberries. How many strawberries does the farmer have in total?
3. A restaurant has 10 tables with 9 chairs each. How many chairs does the restaurant have in total?

Unit 3 Number Operations

Learning Objective:

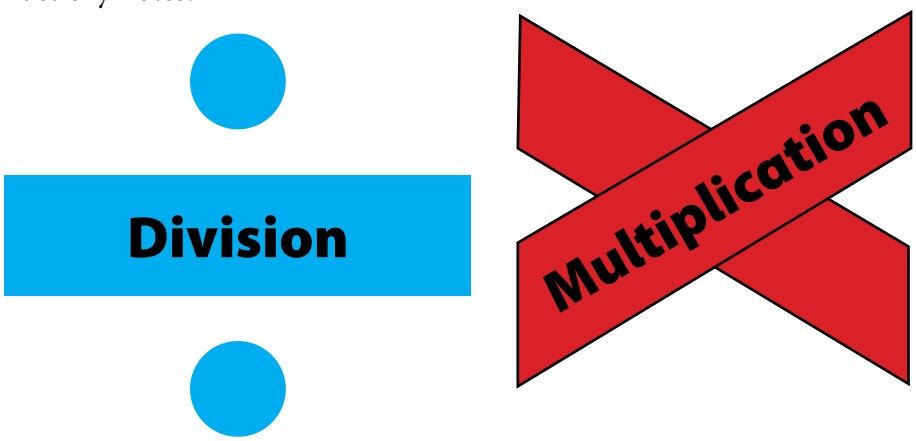
- Solve real life situations involving addition, subtraction, multiplication and division.

Let's Talk Math:

- Ask the class if they use number operations in real life.

Make Sure You Have:

- Different sticky notes.



Activity: Sticky Note Math Operation

Duration: 1 Lesson **Whole Class Activity**

Let's Try It:

- Hand out sticky notes in two different colours to each pupil, ensuring everyone gets one of each colour.
- Explain that each colour represents a different number operation:
- Multiplication
- Division
- Have pupils write the symbol for each operation on its corresponding sticky note.
- Ensure that all pupils follow the same colour system.
- You will read out real-life situations (number stories).
- Pupils will decide which number operation they need to solve the problem.
- Read each question twice, count to three, and pupils will vote by holding up the correct post it notes.

Assessment

- Read out a real-life story and let the students decide which operation to use.

Name: _____

Date : _____

Numbers Chart

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

Count in tens and colour each **ten** a different colour as the chart. Colour each number blue which has **2** in the **once** place. Colour each number red which has **8** in the **tens** place.	*Numbers up to 100*

Note: Hundreds chart can be used as a manipulative.

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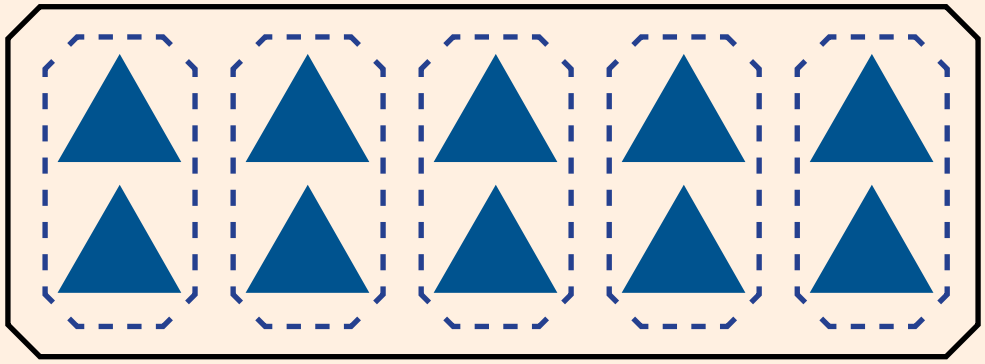
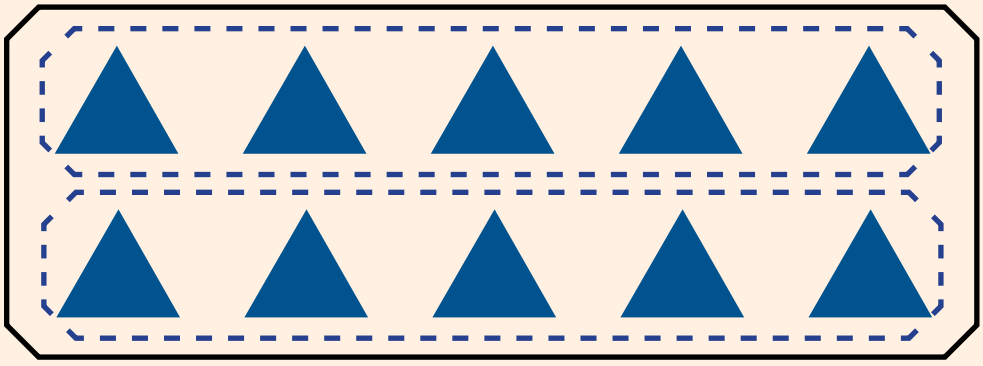
Name: _____

Date : _____

Array Cards



$5 \times 2 = 10$



$2 \times 5 = 10$

Say: 5 sets of 2 = 10 and 2 sets of 5 = 10. Using the grouping method as illustrated above, explain that the multiplication is a **quicker way to do addition**.	*Multiplication*

Note: Arrays can be used to develop understanding of the concept of multiplication.

Name: _____

Date : _____

Multiplication Cards

1 × 3	2 × 3
3 × 3	4 × 3
5 × 3	6 × 3
7 × 3	8 × 3
9 × 3	10 × 3

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Name: _____

Date : _____

Division Cards

3 ÷ 3	6 ÷ 3
9 ÷ 3	12 ÷ 3
15 ÷ 3	18 ÷ 3
21 ÷ 3	24 ÷ 3
27 ÷ 3	30 ÷ 3

Number Operations: Multiplication and Division

Multiply the following.

6 × 5 = ☐	5 × 2 = ☐
10 × 7 = ☐	3 × 5 = ☐
9 × 2 = ☐	10 × 1 = ☐
4 × 2 = ☐	5 × 5 = ☐

Divide the following.

18 ÷ 2 = ☐	45 ÷ 5 = ☐
80 ÷ 10 = ☐	20 ÷ 2 = ☐
25 ÷ 5 = ☐	10 ÷ 10 = ☐
2 ÷ 2 = ☐	50 ÷ 5 = ☐

Number Operations: Multiplication and Division

Multiply the following.

6 × 5 =	30	5 × 2 =	10
10 × 7 =	70	3 × 5 =	15
9 × 2 =	18	10 × 1 =	10
4 × 2 =	8	5 × 5 =	25

Divide the following.

18 ÷ 2 =	9	45 ÷ 5 =	9
80 ÷ 10 =	8	20 ÷ 2 =	10
25 ÷ 5 =	5	10 ÷ 10 =	1
2 ÷ 2 =	1	50 ÷ 5 =	10

Unit 4 Fractions

Learning Framework

Pupils will learn fraction as an equal part of the whole thing as well as read the given fraction as half, quarter, one-third, and whole.

Technically speaking 'stimulus' is a strong desire or readiness of mind to learn something. For this, collect around 100 A4 or around equal size, recycled paper sheets. Call five pupils in front of the class and distribute these sheets in random bunches to the five students and ask them to count the sheets in each bunch. Tell them to return all the sheets except one. Tell them to show the remaining sheet to the whole class. Now tell one pupil to return the last sheet and ask how many sheets are left with him? Answer should be 'zero'.

Now take the sheet from a child, roughly tear it into two parts, keep one part with you and ask the pupil to count the remaining part of sheets. If he says 'one', then show him the sheets with three students, what he has is not equal to one. If he says 'zero' then show the child without any sheet, he is having 'zero' sheet. What is the number of your sheet which is neither 'one' nor 'zero'? Now show that part of the sheet to the whole class and ask how much it is. They should not call it 'zero' as it means nothing. If they call it 'one' show them the whole sheet and tell them this is the 'one' sheet. This activity will give them an idea of the whole thing. If they call it 'half', show them the other part of the same sheet, and ask how much is this? If this is also 'half' then are they equal? Put both the parts together and show they are not equal it means they are not 'halves.

Now take a sheet and ask how much is size A4? Now cut this sheet into two equal parts, show them one part and ask how much is this? Repeat the same question for the other part. Now show them that both parts are equal and when they joined together, they will give a whole sheet of paper. Extend your work by tearing off one sheet in a way that one part is too small than the other part. Now show the students that when both the parts are joined, we get a whole sheet, are these parts two 'halves? Explain to them that these are not equal, so they are not 'halves.

'An equal part of a whole thing is a fraction.' or whatever be your way to describe a fraction it can pave its way into the minds of pupils only through the clear and reliable concept of 'whole'. The value of a fraction is totally dependent on reference of a whole.

If reference is changed, the value of the same fraction will also change. Before making any introduction of a fraction, create a fixed concept of something as whole which should remain unchanged during the initial explanation of the concept of fraction. While explaining equality, tell them clearly two things can only be equal when they look alike and are the same size.

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Lesson Plan

Suggested Time: 1 period

Objectives:

To enable students to:

- Recognise, find, name and write fractions (e.g., $\frac{1}{2}$, $\frac{1}{4}$, $\frac{2}{4}$, and $\frac{3}{4}$)

Concept Connector:

Fractions represent equal parts of a whole, where the whole is divided into identical portions. This concept helps students understand that a fraction is a way to show part of a whole, such as $\frac{1}{4}$ of a circle or $\frac{1}{2}$ of a rectangle.

Exploring the Objective:

Fractions are equal parts of a whole. Before starting the topic, take two A4 size sheets. Fold the first A4 size sheet from its corner and the second, fold it properly in half. Ask the students which sheet is folded into equal parts. Once the chorus of answers is received, explain that that the sheet folded into two equal parts represents fraction. Using the example on ***Page 50,*** explain that the entire pizza is considered as whole, and can be divided into equal parts. By dividing the whole into identical portions, we can create fractions that represent a specific part of the whole. For instance, if we divide a pizza into 4 equal slices, each slice will represent $\frac{1}{4}$ or quarter of the whole pizza.

Activity

Fraction Art

What you need:

- Paper of various colours and textures
- Art marterial, such as colour pencils, markers, or paint
- Fraction charts or diagrams (optional)

How to Play:

- Give each student a piece of paper and art materials.
- Instruct them to create artwork that represents a specific fraction for example, to illustrate $\frac{3}{4}$, students could draw a collage of four identical objects such as flowers, animals, etc., with three objects shaded, leaving one object unshaded).
- Encourage students to use different materials and colors to make their artwork visually appealing.
- Have students share their artwork with the class. while explaining the fraction they have represented.

Reflection:

- Students understand that fractions are equal parts of a whole.
- Students develop the skill to represent fraction.

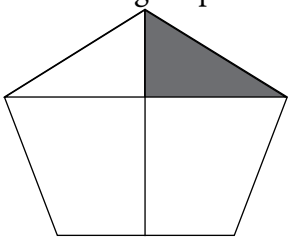
Exercise:

To introduce the concept of fractions, use the example on ***Page 50*** to explain how fractions represent parts of a whole. Have students work on the recognising fraction exercise on ***Page 51*** in class, allowing for guided instruction and feedback. For independent practice, assign theshading exercise questions on ***Page 51*** as homework, enabling students to reinforce their understanding of fractions Use medium-hard level question on ***Page 52*** as a guided practice to be done within the classroom..

Extension Activity:

The following questions can be given as added practice, worksheet or as reinforcement of the topic.

1. Create a real-world scenario where fraction $\frac{3}{4}$ is used.
2. Identify the unshaded part of the following shape:

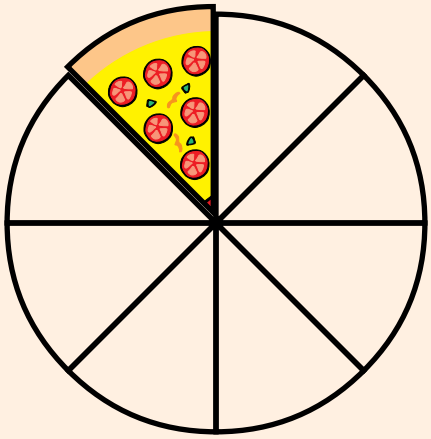


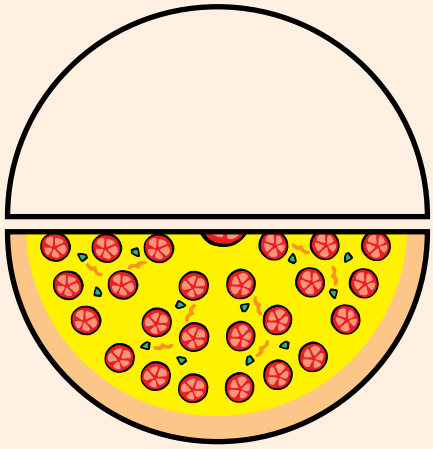
3. Shade 1 out of 2 parts. What fraction did you shade?

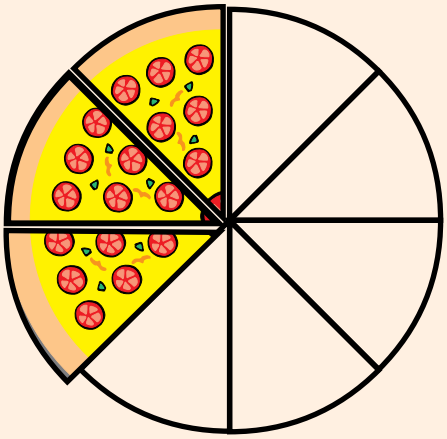
Name: _____

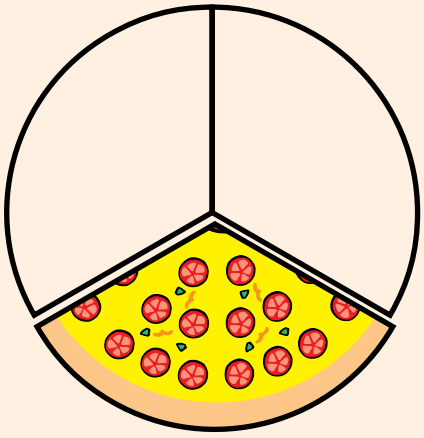
Date : _____

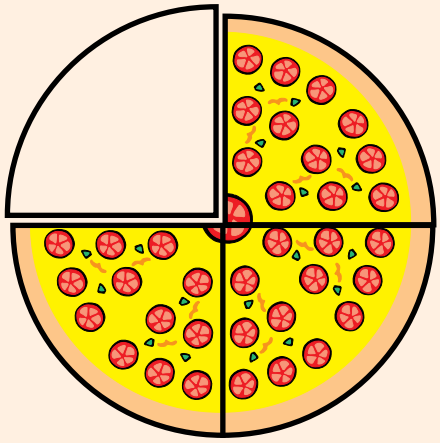
Pizza Party









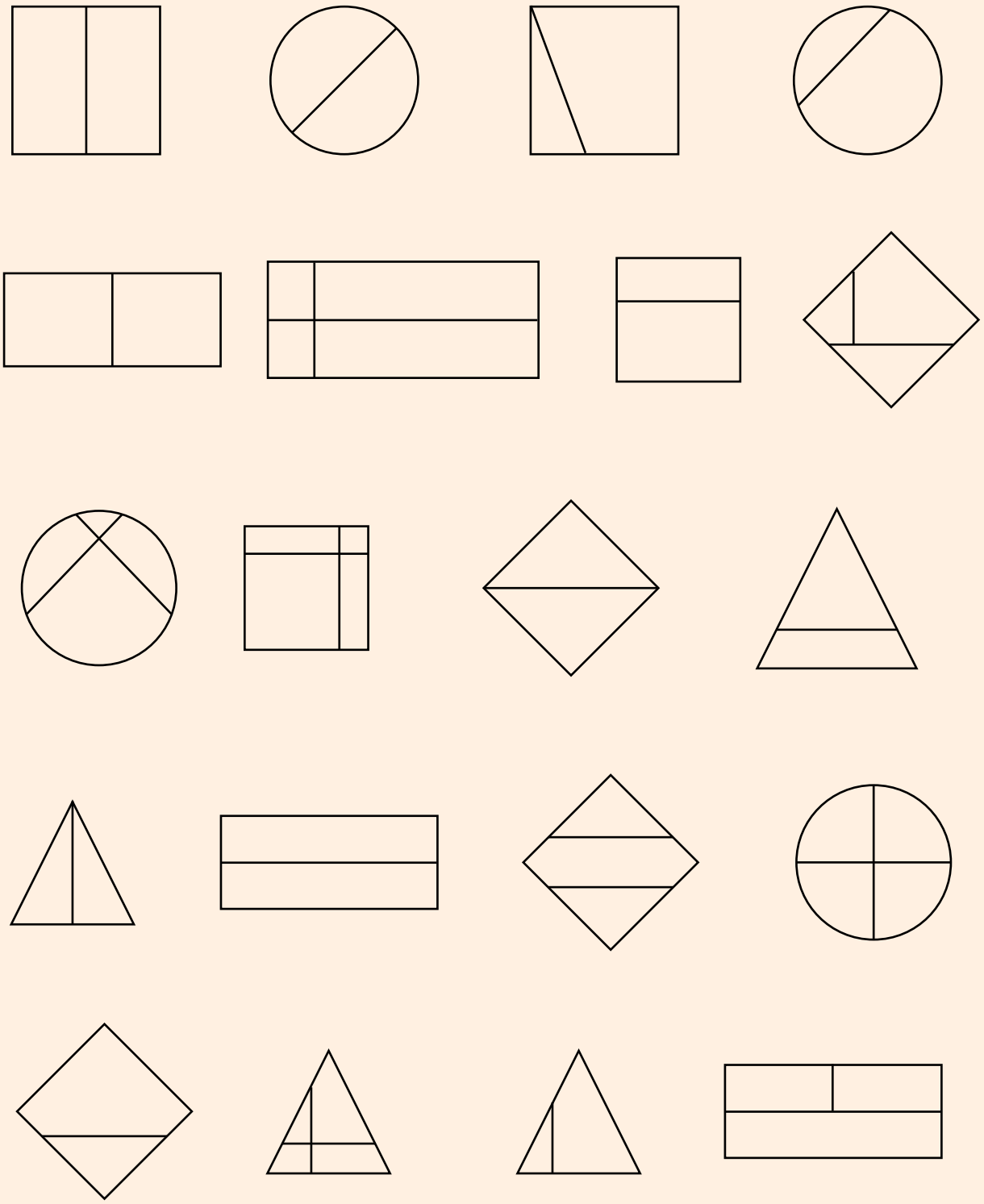


A pizza pie has 8 slices. Looking at the above figures guess how many slices each fraction represents.	*Fractions*

Note: Fraction circles can be used to explain $\frac{1}{2}$, $\frac{1}{4}$,...

Fractions

Encircle figures that are divided into halves.



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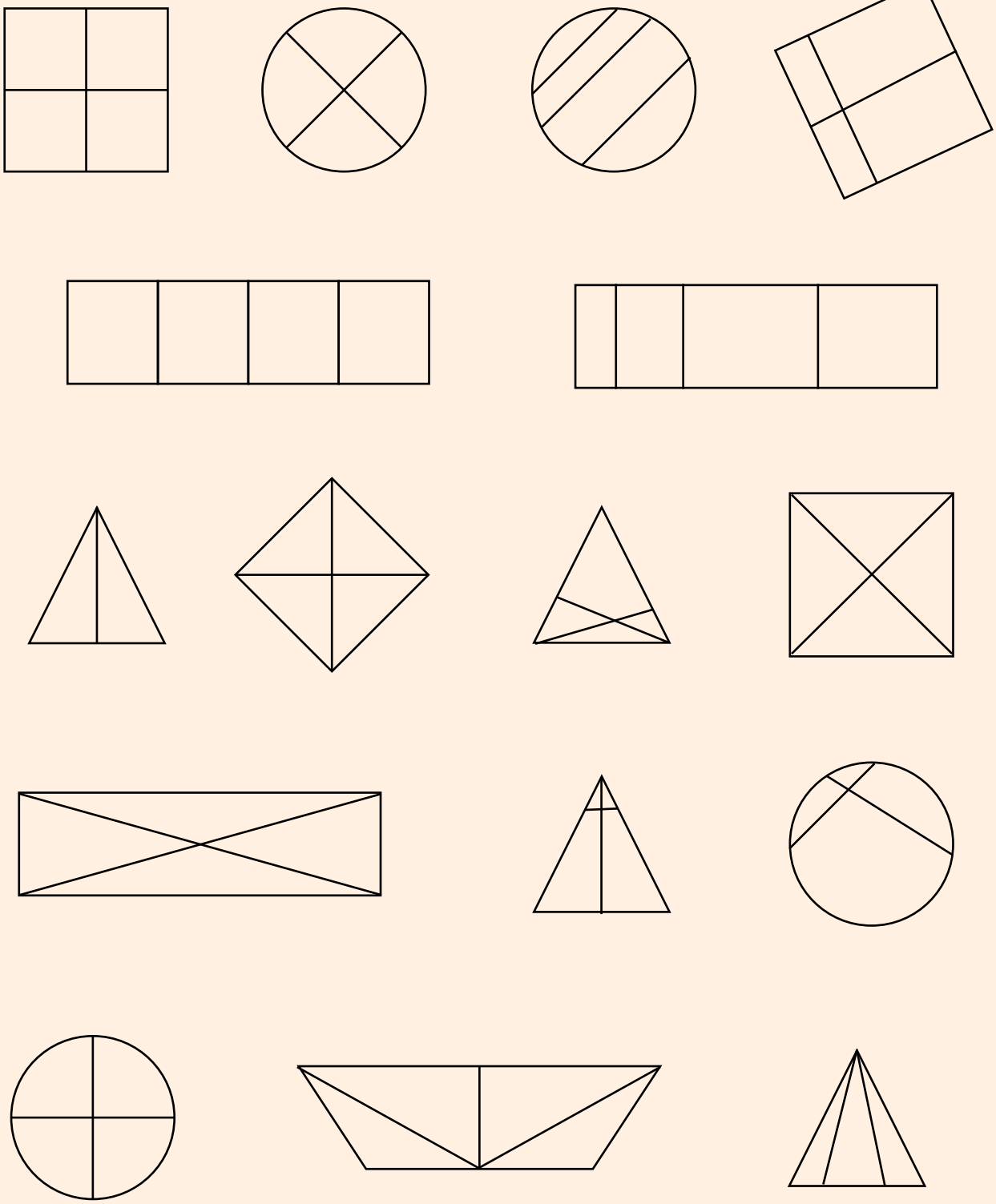
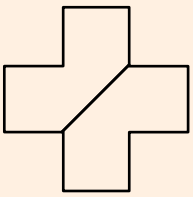
Encircle figures that are divided into quarters.

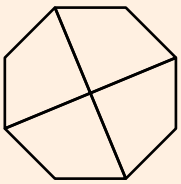


For each shape, colour according to the fraction given. Write fraction names in the blank below.



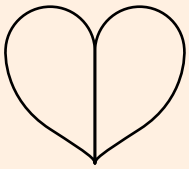
$\frac{1}{2}$

_____



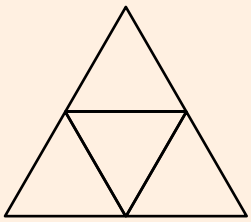
$\frac{1}{4}$

_____



$\frac{1}{2}$

_____

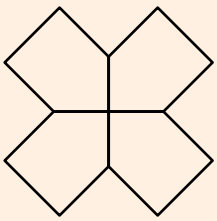


$\frac{3}{4}$

_____

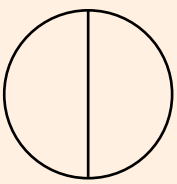
$\frac{1}{4}$

_____



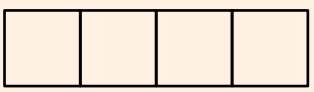
$\frac{2}{4}$

_____



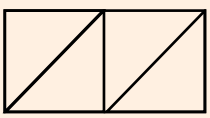
$\frac{1}{2}$

_____



$\frac{2}{4}$

_____

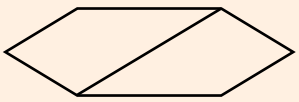


$\frac{1}{4}$

_____

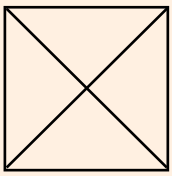
$\frac{3}{4}$

_____



$\frac{1}{2}$

_____

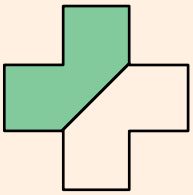


$\frac{2}{4}$

_____

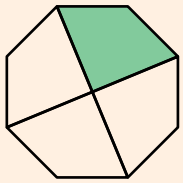
Fractions

For each shape, colour according to the fraction given. Write fraction names in the blank below.



$\frac{1}{2}$

one-half

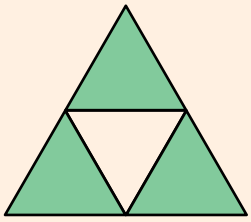


$\frac{1}{4}$

one-quarter

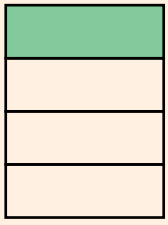
$\frac{1}{2}$

one-half



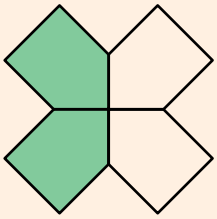
$\frac{3}{4}$

three-fourth



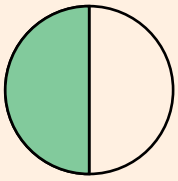
$\frac{1}{4}$

one-quarter



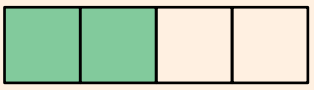
$\frac{2}{4}$

two-fourth



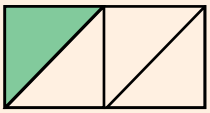
$\frac{1}{2}$

one-half



$\frac{2}{4}$

two-fourth

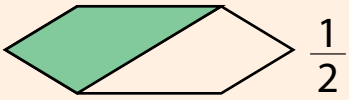


$\frac{1}{4}$

one-fourth

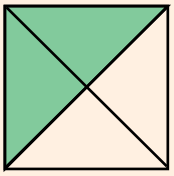
$\frac{3}{4}$

three-fourth



$\frac{1}{2}$

one-half



$\frac{2}{4}$

two-fourth

Unit 5 Money

Learning Framework

Re 1

Rs 2

Rs 5

Rs 10

Rs 10

Rs 20

Rs 50

Rs 100

Rs 500

Rs 1000

Rs 5000

Pupils will begin by learning to identify coins and banknotes of Pakistani currency, including the name of the currency and the different denominations.

To introduce this concept, ask pupils where they get their uniform, shoes, books, and school bag. How did they get these things? Did they give something to the shopkeeper to get these things? Ask similar questions until the idea of 'Money' is prompted. Ask them what money looks like, what the name of our currency is, and what the different forms of our currency are. Now, show coins and banknotes and talk about their denomination.

Use both forms of currency to demonstrate addition, showing how the price of an article matches the price paid. Explain how the same value of currency can exist with different numbers and different banknotes and coins. If available, use fake banknotes and coins to demonstrate how cash transactions are made in real life. Pupils will engage in these activities with deep interest. Next, pupils will learn to calculate the sum of money required to carry out a purchasing transaction.

This involves applying their knowledge of addition to real-life scenarios. Pupils will learn how to calculate the total cost when buying different objects with different prices. This skill will enable them to make informed decisions when making purchases.

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Lesson Plan

Suggested Time: 1 period

Objectives:

To enable students to:

- Identify Pakistani coins (Re 1, Rs 2, Rs 5 and Rs 10) and notes (Rs 10, Rs 20, Rs 50, Rs 100, Rs 1000, and Rs 5000).
- Match a group of coins/notes to an equivalent group of different denominations.
- Add and subtract money using the prices of objects (transactions).

Concept Connector:

Money is a fundamental concept that enables students to understand the value of goods and services. In this unit, students will learn to recognise Pakistani coins and banknotes and use their prior knowledge to count them. By doing so, students will understand the concept of saving and spending and develop an appreciation for the importance of money in everyday life.

Exploring the Objective:

Introduce the concept of money to students using the pictures on ***Page 54,*** highlighting the basics of Pakistani currency. Dummy money can also be used to show students as well. Then, use the ***Math in Action*** on the same page to explain how money has evolved over time, replacing the traditional barter system of exchanging goods and services. Next, use ***Page 56*** to demonstrate how money is used in everyday transactions. Emphasise the importance of addition and subtraction skills in making seamless transactions, such as calculating change or totaling costs.

Activity

Pakistani Currency Store

What you need:

- Play money (Pakistani coins and notes)
- Price tags with amounts up to Rs 100
- Toy items or pictures of everyday objects

How to Play:

- Divide the students into pairs or small groups.
- Set up a pretend store with toy items or pictures of everyday objects.
- Use price tags to a assign prices to each item.
- Give each group a set amount of play money (e.g., Rs 100).
- Have the students take turns selecting items from the store and calculating the total cost.
- The cashier (teacher) will ask the student to pay using the correct combination of coins and notes.

Reflection:

- Students develop their understanding of Pakistani currency and its practical applications.
- Students reinforce their knowledge of addition and subtraction skills through transactions.
- Students understand the value of money and its importance.

Exercise:

Utilise the ***Math Lab Page 36*** and exercise on ***Page 55*** to facilitate hands-on practice, enabling students to develop a fundamental understanding of money concepts. Through in-class exercises, students will refine their skills in totaling money and matching correct answers. To build students' proficiency in handling money transactions, guide them through the questions on ***Page 57***. For additional practice, leverage ***Math Lab Page 37 and 38*** and ***QR activity worksheets on Page 57*** to reinforce the concept of shopping.

Assign the questions on ***Page 56*** as individual homework, as students will have already attempted similar questions in class, ensuring a seamless understanding of the concepts.

Extension Activity:

The following questions can be given as added practice, worksheet or as reinforcement of the topic.

1. A book costs Rs 20. If you have four Rs 5 notes, do you have enough money to buy the book? Explain your answer.
2. If you have five Rs 2 coins, how much money do you have in total?
3. If a pen costs Rs 20 and you pay with Rs 50 note, how much change will you get?
4. You have three Rs 5 coins and two Rs 10 notes. How much money do you have in total?

Unit 5 Money

Learning Objective:

- Identify Pakistani currency notes

Let's talk math:

Money

Pakistani Currency

- Ask the class how confident they feel handling money now.
- Ask them if this unit reminds them of any previous unit they have studied

Make Sure You Have:

- Pakistani Currency Notes

Activity: Guess the Banknote

Duration: 1 Lesson

Group activity

Let's Try It:

- Set out different currency banknotes in front of the class.
- Hold up each banknote and ask pupils to identify them.
- Instruct pupils to make rough drawings of each banknote on A4 paper using colour pencils.
- Encourage pupils to focus on recognizing banknotes based on colour and design rather than reading the number.
- Help pupils cut up the A4 papers to separate the banknote drawings.
- Ask pupils to partner up and take turns showing each other their drawn banknotes one by one, while covering the numbers.
- Have the partner guess which banknote they are being shown based on its colour and design.
- Allow pairs to briefly discuss and identify differences in the banknotes.

Assessment:

- Assign some exercises from the textbook that will help familiarize students with currency.

Name: _____

Date : _____

Shopping Trip

Items bought	Cost of Item	I bought it using...
Candy	Rs 5	I five rupee coin
Book	Rs 25	
Toy Car	Rs 92	
Cupcake	Rs 45	
Juice	Rs 60	
Chocolate	Rs 52	

Have them record their purchase in chart using money with different denominations. Ask them to discuss different combinations of currency used.	*Equivalent sets of money*

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Name: _____

Date : _____

Using My Allowance

Item	Can buy	Price	Money in Hand	Require
Glasses	No	Rs 68	Rs 50	Rs (68 – 50) = Rs 18

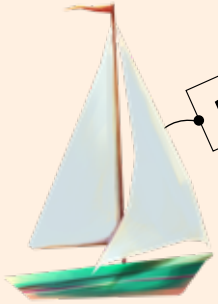
For each item decide if you have enough allowance. If not, then decide how much more you need and if yes then decide the combination of **notes** and **coins** needed. Assume that you have Rs 50.	*Comparing money*

Money

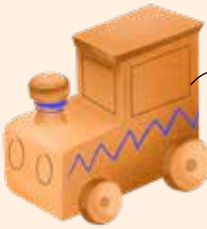
Count the money and join the correct amount to the toy that can be bought.

Rs 75

Rs 40



Rs 50



Rs 85

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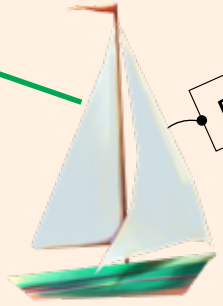
Money

Count the money and join the correct amount to the toy that can be bought.

Rs 75

Rs 40

Rs 50



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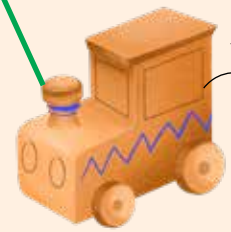
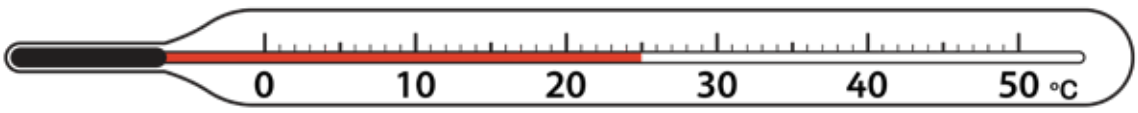


Unit

6 Measurement: Length, Mass, Capacity, and Temperature

Learning Framework



- **Pupils will learn to compare different objects based on their lengths.**
- **They will get acquainted with the different length units and will use them to compare the length of different objects.**

Before introducing any unit of length, it is necessary to emphasis upon the need for units. Draw on board two lines side by side of approximately equal length. Name them as Line-A and Line-B. Now ask a pupil which line is larger? If he says line-A, tell the class that from your position line-B seems larger. Change your position and repeat the same question with another pupil and oppose his reply with the same argument. After some time, ask the class, are these lines equal? Whatever the reply is, ask them how we can confirm this? In the end use the length of your palm to measure the length of each line and finally decide which line is longer.

- **Pupils will learn to compare different objects based on their weights).**
- **They will get acquainted with the different devices used to measure the mass and with the different objects which can be used as units of mass.**

Bring a book or anything safer for young pupils. Introduce it to class as a standard object. Put a few more safe objects there. Let the students pick the book and then other objects and decide which object is heavier or lighter than the book. Show them some cotton and let them hold it to guess its mass. It is so big but has less mass than the book.

Pupils will learn to compare different objects based on their capacities to hold liquids.

The concept of capacity / volume is beyond the scope of the curriculum of this age group. Show them a used bottle of perfume and ask which can hold more water, this small bottle or your water bottle. An object with small capacity can hold less water while objects with larger capacity can hold more water.

Pupils will learn to compare the temperature of different objects and read the temperature on the thermometer.

The concept of temperature is well understood as cold, warm, colder and warmer words in this age group. Elaborate these words using different examples from daily life like ice, tea, an object kept in the shade, and an object kept in the sun. Show them a thermometer and measure the temperature of hot and cold objects and enable your pupils to read it.

Lesson Plan

Suggested Time: 2 periods

Objectives:

To enable students to:

- use mathematical language to compare the length/height of two or more objects.
- measure and compare the length of objects using non-standard units.

Concept Connector:

Length is a measure of how long something is from one end to the other end while height is how tall an object is from the ground. From measuring the length of a pencil to calculating the height of a building or a mountain, understanding length and height helps us navigate and make sense of the world around us.

Exploring the Objective:

Height and length are two important concepts that help us measure things around us. Explain to students that height refers to how tall something is, measuring the distance from the bottom to the top. On the other hand, length measures how long something is, calculating the distance from one end to the other. Use the examples on ***Page 59*** to illustrate the context for each. The students can also be taken to a school playground or a park to compare the lengths and heights of different objects. Once they compare different objects, the ***QR activity worksheet on Page 60*** can be used to record their observations. ***Math in Action on Page 62*** should be used as a fun fact to be shared in class.

Once the concept of comparison of objects is concrete, introduce the students to non-standard units of measurement, such as handspan, cubit, and footspan, using the examples on ***Page 61***. The teacher may demonstrate the measurement of objects using non-standard units by using everyday objects, such as pencils, book, erasers, etc to measure the length of a book or the length of a desk.

Activity

Measurement and Comparison of Length

What you need:

- Rulers
- Non-standard units, such as blocks, counters)
- Objects of varying lengths and masses, such as pencils, books, toys

How to Play:

- Review vocabulary related to length and mass, such as long, longest, shorter, short.
- Introduce non-standard units of measurement.

- Group students and provide them with a set of objects (such as books, tables, etc.) and ask them to measure and compare the lengths using their choice of non-standard units of measurement.
- Once they are done, ask the groups to exchange the non-standard units of measurement amongst each other and measure the length of objects again.
- Discuss the differences in measurement for different non-standard units.

Reflection:

- Students understand the concept of length and height.
- Students develop calculation skills through measuring and comparing lengths.

Exercise:

Once the students are familiar with the vocabulary to compare the lengths and heights of objects, use ***Page 60*** as a classroom activity. To practice using non-standard units of measurement, use questions on ***Page 61*** to conduct in class and give ***Page 62*** as homework.

Extension Activity:

The following questions can be given as added practice, worksheet or as reinforcement of the topic.

1. If a toy car is 1 crayon long and a toy truck is 3 crayons long, which one is longer?
2. Compare the length of your pencil with a friend's pencil. Who has a longer pencil?
3. Ali is 20 handspan tall and Ahmed is 15 handspan tall. Which boy is taller?

Unit 6 Length

Learning Objective:

- Compare the heights/lengths of two or more objects using the terms:
- Long, longer, longest
- Short, shorter shortest
- Tall, taller, tallest
- High, higher, highest

Let's talk math:

- Ask pupils to give examples of what they would describe as long.

Make Sure You Have:

- Pencils

Activity: Compare and Discover

Duration: 1 Lesson **Whole class activity**

Let's Try It:

- Pull out 5 short and some long pencils.
- Hold them up one by one in front of the class.
- Ask them which are long or short.
- Once you have two sets of pencils, hold up the short ones only, and ask them which one is the longest out of them.
- Point out that even though all the pencils are short, some of them are still longer than the others.
- Do the same with the long pencils

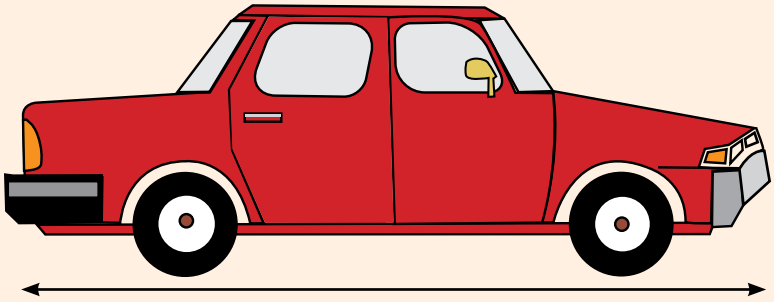
Assessment:

- Draw five sets of lines on the board.
- Let there be three lines in each set.
- Tell the pupils that the line on the top is the first line.

Name: _____

Date : _____

Guessing Length



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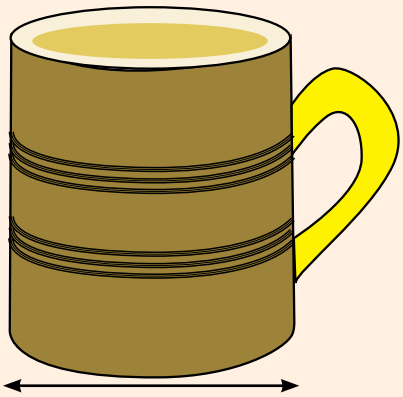

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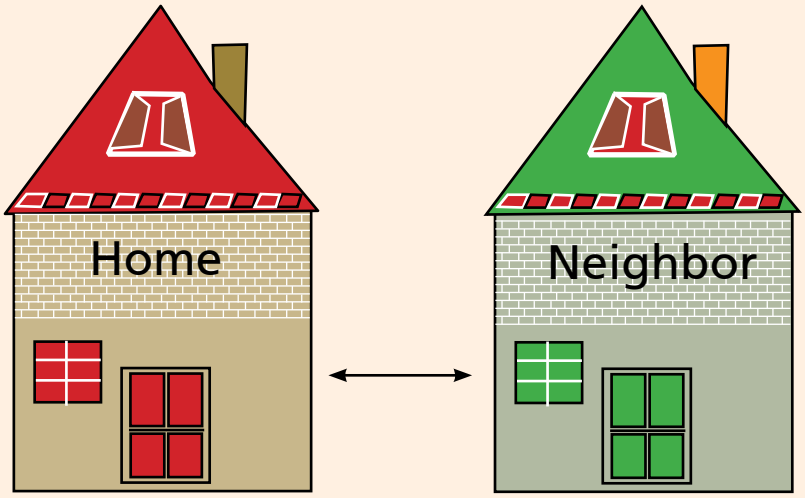
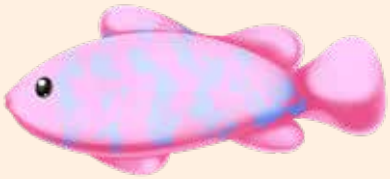


_____

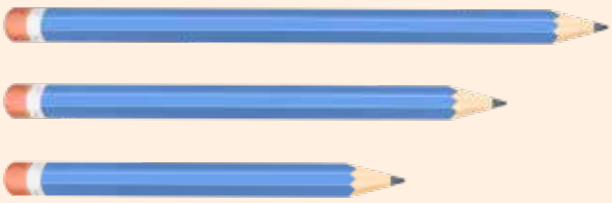
Guess the appropriate **unit of measure** for each of the above. Also make an **estimate** of what you think the length might be.	*Length*

Measurement: Length, Mass, Capacity, and Temperature

Tick (✔) the longer fish.



Tick (✔) the longest pencil.



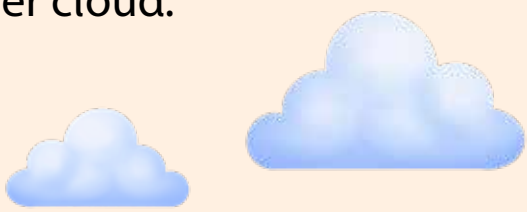
Tick (✔)the shorter trousers.

Tick (✔)the shortest rabbit.

Tick (✔) the taller vase.

Tick (✔) the tallest kid.

Tick (✔) the higher cloud.



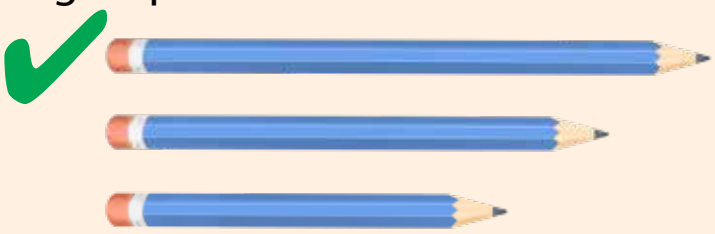
Tick (✔) the highest bird.

Tick (✔) the heavy basket, cross (✗) the heavier basket, encircle the heaviest basket.

Measurement: Length, Mass, Capacity, and Temperature

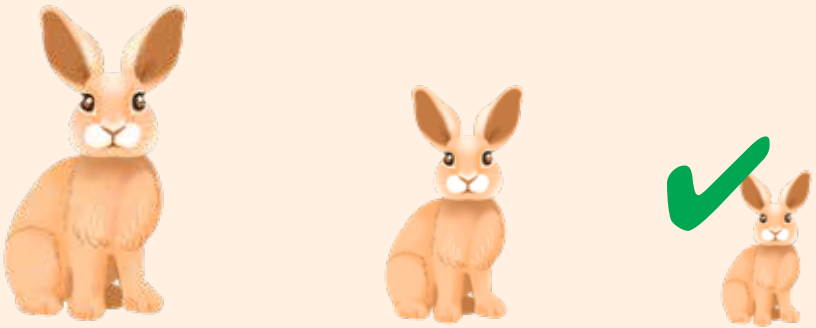
Tick (✔) the longer fish.

Tick (✔) the longest pencil.



Tick (✔)the shorter trousers.

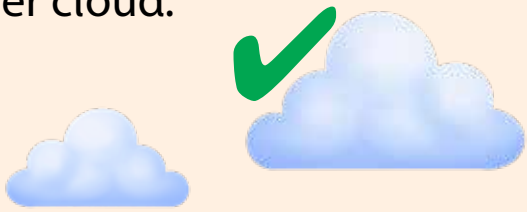
Tick (✔)the shortest rabbit.



Tick (✔) the taller vase.

Tick (✔) the tallest kid.

Tick (✔) the higher cloud.



Tick (✔) the highest bird.

Tick (✔) the heavy basket, cross (✗) the heavier basket, encircle the heaviest basket.

Unit 7 Measurement: Time

Learning Framework

- **Pupils will begin by learning to identify the minute and hour arms of a clock, as well as the position of numbers on the dial.**
- **They will also learn to read the time in exact hours on an analog clock.**

To introduce this concept, teachers must keep in mind that time is an abstract idea that can be perplexing for young pupils. While teaching, focus on two aspects of the word "time": specific time at a particular geographic location, indicated by watches or clocks, and duration.

Ask pupils a series of questions to help them recall how the word "time" is interpreted in their lives. For example, "When do you go to bed at night?" or "How long do you sleep at night?" This thought-provoking activity is designed to encourage pupils to think and answer every question, rather than checking their knowledge. For demonstration, use a large-sized actual analog wall clock with numerals on the dial, and hour and minute arms only. Ask pupils what the difference is between the two arms on the clock and introduce both arms. Change the time on the clock to exact hours and ask the pupils, "What is the time now?" This will help them understand that the clock shows the current time only.

Pupils have grasped the concept of reading time on an analog clock, they will learn to read and write time on a digital clock in exact hours.

Since they have already learned how to read time on an analog clock, a little explanation of the position of the digits of hours and minutes will enable them to read time on a digital clock. Use digital clocks or apps to practice reading and setting times.

Pupils will learn about the days of the week, including how many days there are, their names, and the sequence of their occurrence.

Ask small questions to create a stimulus, such as "On which day does school remain closed?" or "What is the day when we come back to school after the weekend?" Note down the pupils' feedback on the board to let them know the correct spellings of the names of the days of the week. Explain that the week begins on a specific day and proceeds in a particular order of days. Use songs, rhymes, and visual aids to help pupils remember the days of the week.

Pupils will learn to identify the name and position of months in both solar and lunar (Islamic) years.

Ask small questions to create a stimulus, such as "In which month do we celebrate our Independence Day?" or "In which month do we fast?" If pupils fail to answer a question, write the correct answer on the board. Show them that the months listed as answers belong to two different types of calendars. Write the names of the months of the solar year in order from January to December and later write the names of the months of the lunar year in order from Muharram to Zul Hajjah. Use calendars and visual aids to help pupils understand the sequence and significance of each month.

Lesson Plan

Suggested Time: 2 periods

Objectives:

To enable students to:

- Read and write time in hours (o'clock) from analogue and digital clocks.
- Show time in an hour on an analogue clock.
- Name in order the days of the week.
- Identify which day comes after/before a particular day.

Concept Connector:

We use time to plan our day, schedule our activities, and know when it is time for our favorite things. Time helps us understand the order of events, from morning to night, and from one day to the next. In this unit, students will learn to tell time, days of the week, understand time vocabulary, and develop an awareness of time concepts that will help them navigate their daily lives.

Exploring the Objectives:

Guide students in learning to tell time using digital and analogue clocks with the examples on ***Pages 70 and 72.*** This foundational instruction will establish a basic understanding of time-telling concepts. Use a clock with a moveable hand to explain to the students how to read time on the analogue clock. Once the studetns are fimiliarised with the analogue clocks, ***use QR activity worksheet on Page 70*** to be done as a fun activity. mention how digital clocks show time in a different manner than analogue clocks. Pair this information with ***Math in Action on Page 71*** as a fun fact.

Explain the days of the week and their sequence, as outlined on ***Page 72.*** By integrating time-telling skills with an understanding of the days of the week, students will gain practical experience in managing their time.

Activity

Time Management Masters

What you need:

- Blank schedules templates
- Markers/colored pencils
- Analogue clocks
- Digital clocks

How to Play:

- Distribute blank schedule templates to students.
- Ask students to create their own daily schedules including time for school, homework, play, fun activities (reading, drawing, etc.), breaks (snack time, recess, etc.)

- Encourage students to think about their daily routines and activities they enjoy. Remind them to include time for rest and relaxation.

Reflection:

- Students develop clear instructions and demonstrations on using analogue clocks and creating schedules.
- Opportunities for students to practice time-telling and scheduling skills.

Exercise:

Assign ***Page 70*** as class work, where students will work on the exercises with teacher guidance. Additionally, have them complete the ***QR activity worksheet. Math Lab Pages 39-45*** can be used as a fun activity to do in the classroom. For individual homework, assign ***Page 71,*** which provides extra practice in telling time using analogue clocks.

Make them attempt ***Page 73*** as classwork with ***Maths Quest*** to be given as medium-level homework assignment.

Extension Activity

The following questions can be given as added practice, worksheet or as reinforcement of the topic.

1. Create a word search or crossword puzzle with the days of the week of the Solar year. Ask students to complete the crossword puzzle by providing them clues.
2. Draw an analogue clock showing the following times, identify the minute and the hour hand:
   a. 3 o'clock
   b. 10 o'clock
   c. 7 o'clock

Unit 7 Time

Learning Objective:

- Recognise the hour and minute hands of an analogue clock.
- Read and tell time in hours from the analogue clock, for example 2 o'clock.

Let's talk math:

- Start this unit by asking the pupils what time they wake up.
- Then ask them about what time they go to sleep.

Make Sure You Have:

- Chart Papers
- Scissors

Activity: Make Your Own Clock

Duration: 1 Lesson **Group activity**

Let's Try It:

- Show an analogue clock and explain the minute and hour hands.
- Ask pupils how to differentiate between the two
- Give chart paper and guide pupils to:
- Draw and cut out a circle.
- Write clock numbers on the circle.
- Draw the minute hand pointing to 12.
- Cut out the hour hand from the remaining chart paper.
- Attach the hour hand to the clock.
- Use the clock to demonstrate telling time to the hour.

Assessment:

- Read out a time (without minutes) and ask the pupils to arrange their hour hands to reflect that time, and then raise them simultaneously.

Days of the Week

Learning Objective:

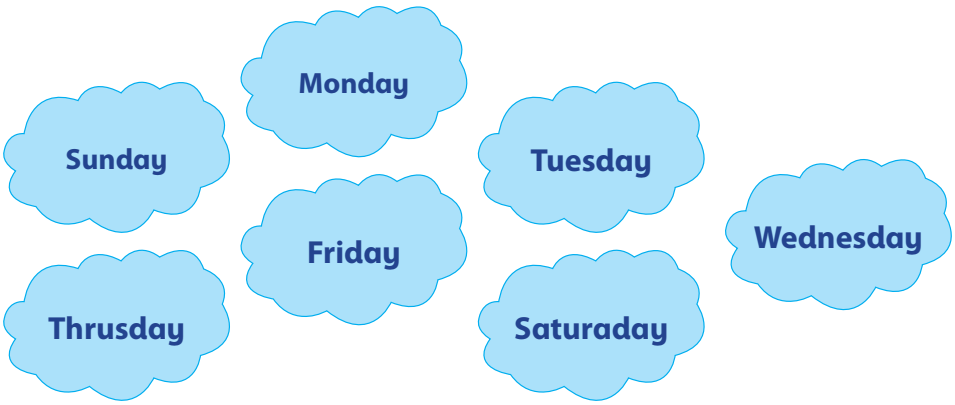
- Name the days of the week in order
- Identify which day comes before/after a particular day

Let's talk math:

- Ask them if they can think of any other way that people to know when to do things.
- Ask them which days they do not come to school.
- Explain that these are all different ways one can measure and organise time.

Make Sure You Have:

- Flash cards with names of the days in a week



Activity: Days in Action!

Duration: 1 Lesson **Whole Class Activity**

Let's Try It:

- Display three flashcards with the names of the days.
- Ask the pupils to call out the names of the missing days.
- Show the names of the days in order.
- Display a calendar and explain how the days are organied within each month.
- Teach them how to find the corresponding day for a particular date on the calendar.
- Put an enlarged page of the calendar on the board.
- Ask different questions to reinforce learning, such as:
- What day comes after Tuesday?
- What is the day on the 25th of the month?
- What is the day before the 7th of the month?

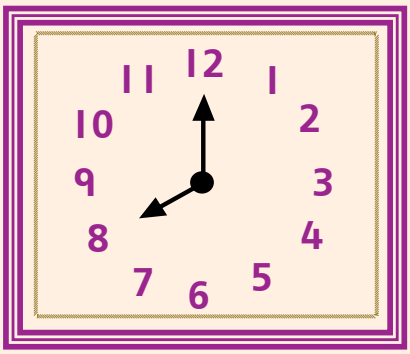
Assessment:

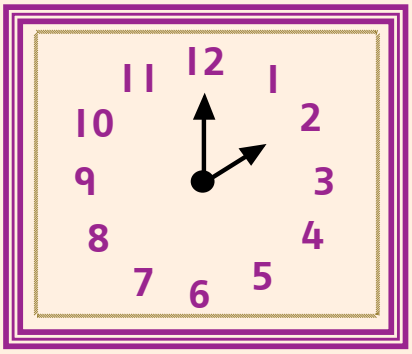
- Tell the pupils that you will be calling out a day and they must raise their hands to tell you the name of the day that comes after.
- So, if you shout out "Wednesday", a pupil should raise their hand to say "Thursday".
- For the first few rounds, let them answer as a class so that they can get used to the activity.

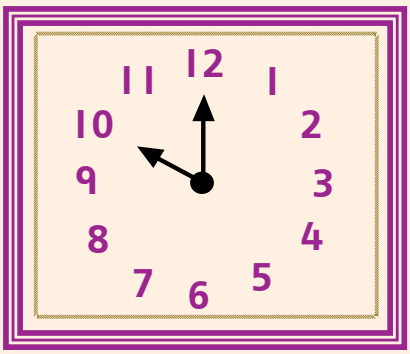
Name: _____

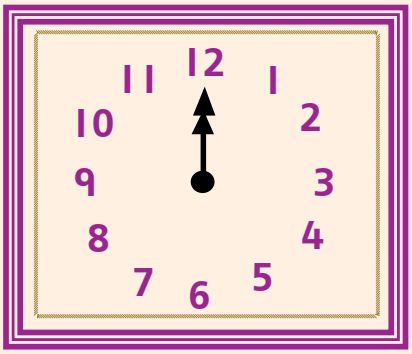
Date : _____

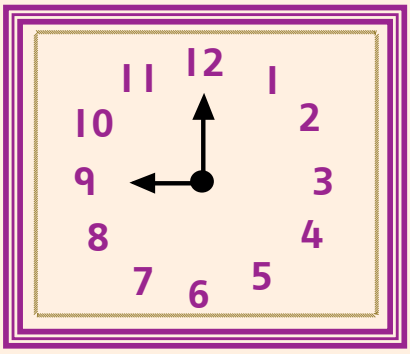
Time Bingo 1

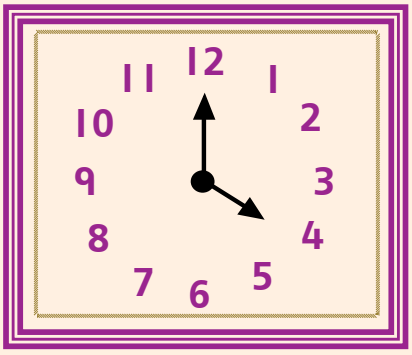












Get the students to fill in Time Bingo I by **reading the clocks** and then play the "Bingo" game by putting a tick (✓) on the card on the next page.	*Time*

Note: Analogue and digital clocks can be used to show different times.

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Name: _____

Date : _____

Time Bingo 2

8:00	3:00	2:00
5:00	6:00	7:00

10:00	8:00	12:00
6:00	12:00	4:00

2:30	7:00	6:00
11:30	4:00	5:30

1:30	9:00	12:00
12:30	3:00	10:30

5:00	8:00	1:30
10:30	12:00	2:00

4:30	7:00	11:00
11:30	2:00	10:30

	Time

Name: _____

Date : _____

Division Cards

2 ÷ 2	4 ÷ 2
6 ÷ 2	8 ÷ 2
10 ÷ 2	12 ÷ 2
14 ÷ 2	16 ÷ 2
18 ÷ 2	20 ÷ 2

Note: Cuisenaire rods can be used to demonstrate the division of numbers.

Name: _____

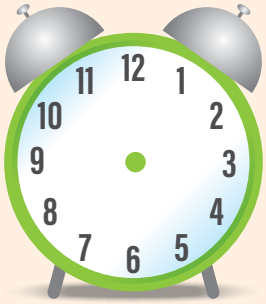
Date : _____

Division Cards

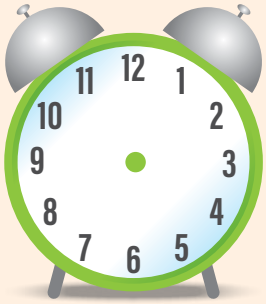
4 ÷ 4	8 ÷ 4
12 ÷ 4	16 ÷ 4
20 ÷ 4	24 ÷ 4
28 ÷ 4	32 ÷ 4
36 ÷ 4	40 ÷ 4

Measurement: Time

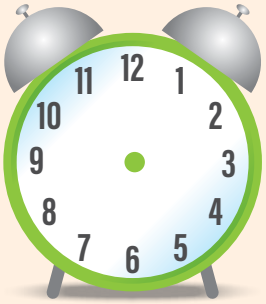
Draw hands on each clock to show the given time.



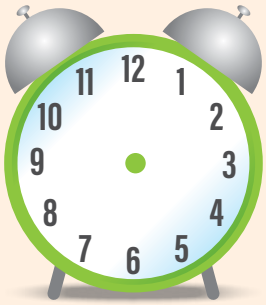
10 o'clock



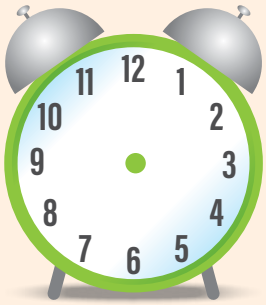
3 o'clock



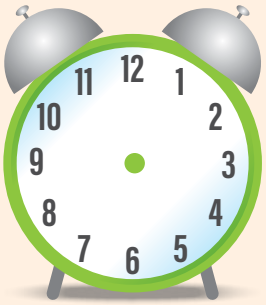
12 o'clock



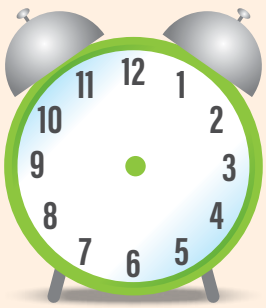
5 o'clock



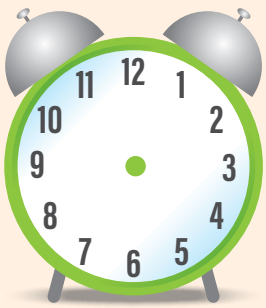
6 o'clock



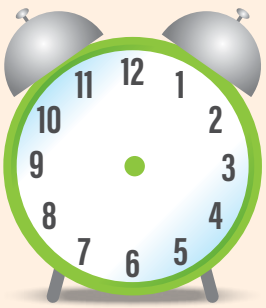
9 o'clock



7 o'clock



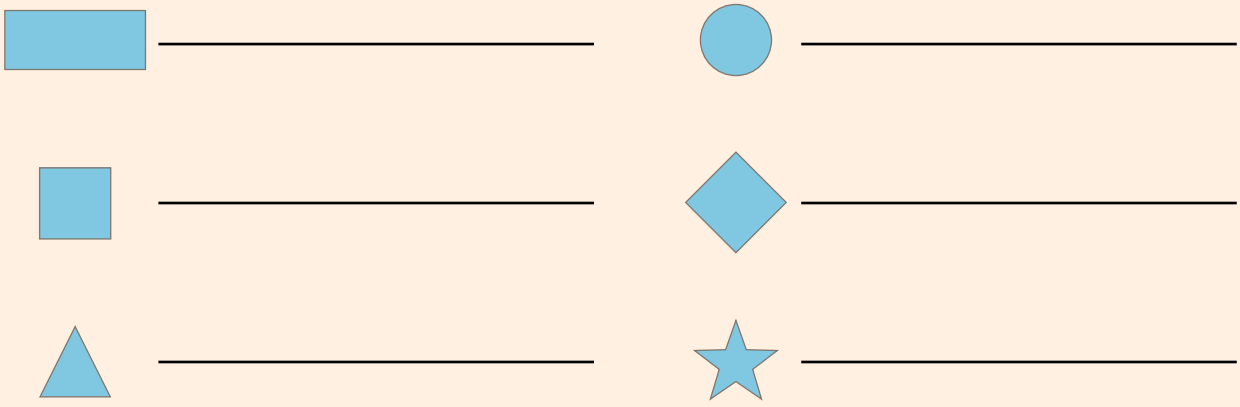
2 o'clock



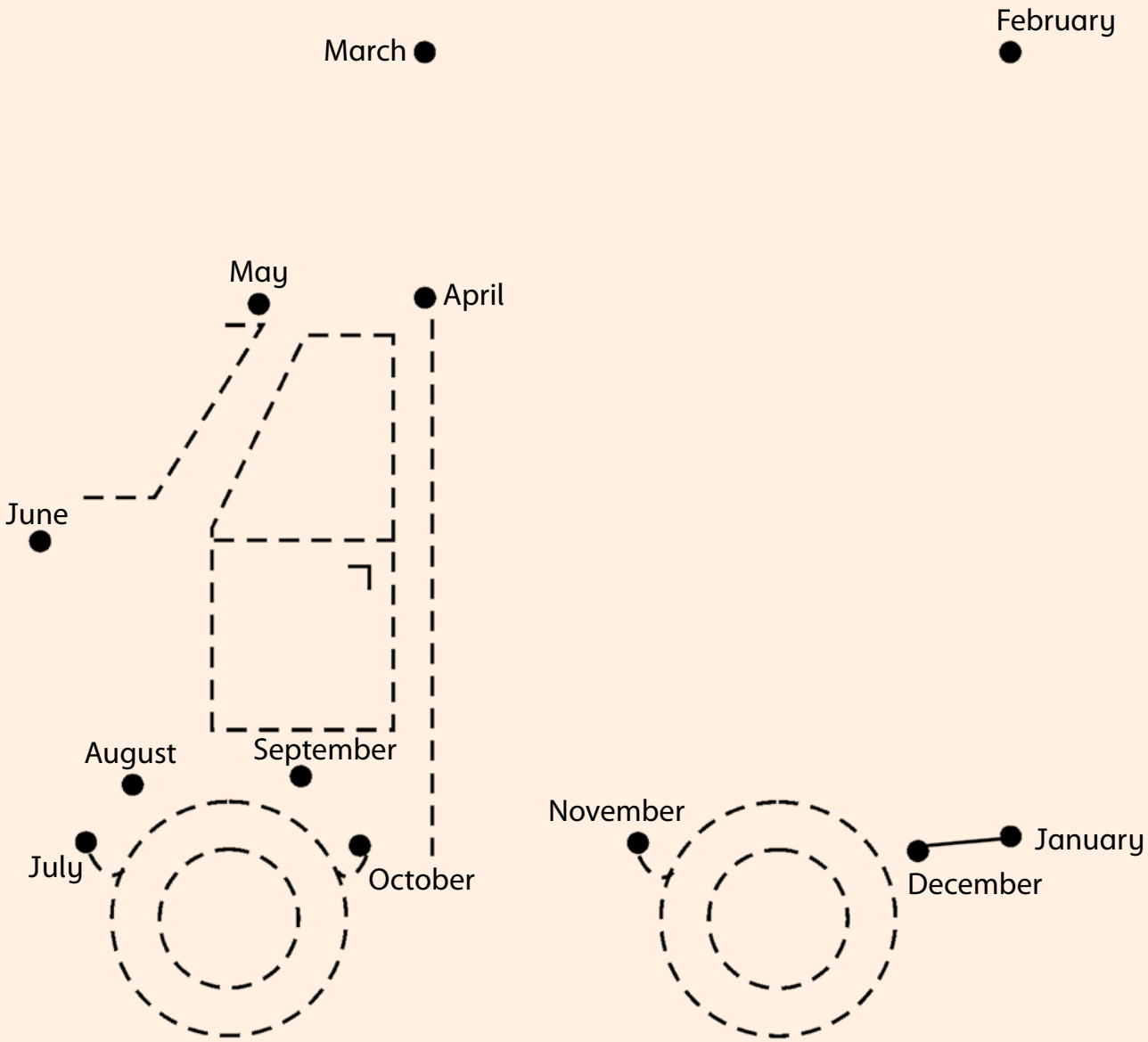
8 o'clock

This is a clock face. Write numbers from 1 to 12 in the shapes.

Now, write which numbers each of the following shapes stands for on the clock face.



Join the dots according to the order of solar months in a year. Start from January and colour as you like.



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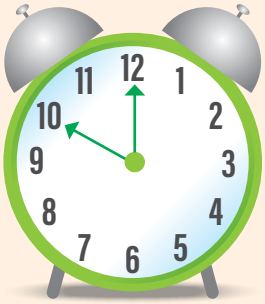
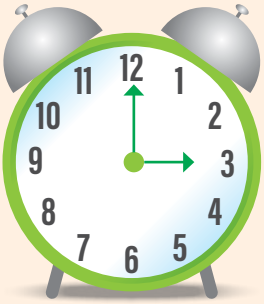
Measurement: Time

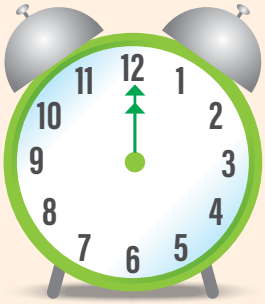
Draw hands on each clock to show the given time.



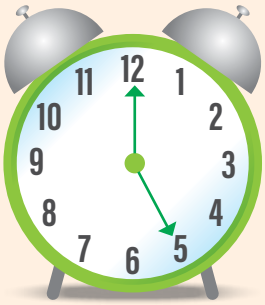
10 o'clock



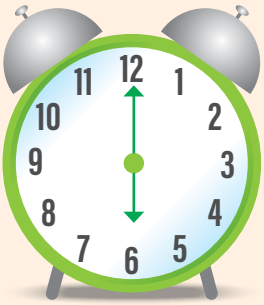
3 o'clock



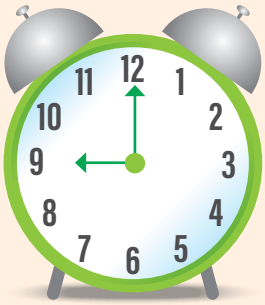
12 o'clock



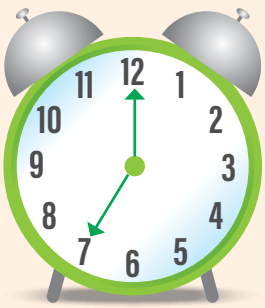
5 o'clock



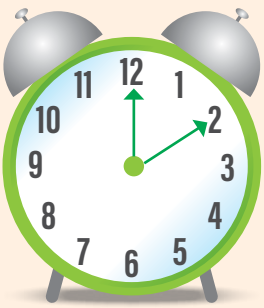
6 o'clock



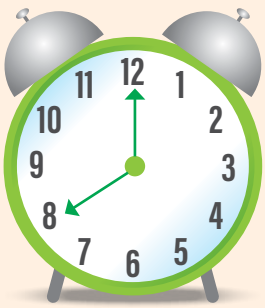
9 o'clock



7 o'clock



2 o'clock



8 o'clock

This is a clock face. Write numbers from 1 to 12 in the shapes.

Now, write which numbers each of the following shapes stands for on the clock face.

 5, 11

 8

 4, 10

 12, 7

 3, 9

 2, 8

Unit 8 Geometry

Learning Framework

Pupils will explore the world of geometry, starting with the identification of basic geometrical shapes like squares, triangles, rectangles, and circles in daily life objects.

Geometry, being the first child of philosophy and the mother of all mathematics, requires a thoughtful approach to teaching. It's essential to recognize that geometry is an abstract concept that cannot be defined, and its learning relies heavily on pupils' photographic memory.

To enrich pupils' photographic memory with basic geometrical shapes, a carefully planned activity is necessary. Prepare colored card papers cut into various shapes, including circles, squares, triangles, and rectangles. Place these shapes on a large table and engage pupils in grouping the cards based on their color, size, and finally, shape. As pupils work on this activity, provide support and guidance to ensure they understand the characteristics of each shape. Once pupils have grouped the shapes correctly, explain the properties of each shape. For instance, all circles are round, all triangles have three sides, and all rectangles and squares have four sides. Highlight the difference between squares and rectangles, emphasizing that squares have sides of equal length, while rectangles have sides of two different lengths.

Pupils will move on to identify sides and corners in these shapes.

Draw two line-segments on the board, demonstrating how they have one common endpoint, which is a corner. Explain that the lines are sides, and the common point where two lines meet is a corner. Use real-life examples and objects to help pupils identify sides and corners in their environment.

Pupils will learn to identify patterns in given shapes and list the next elements in the pattern.

This skill relies on their ability to recognize different shapes and recall their names. By applying their knowledge of shapes, pupils will be able to identify and continue patterns. Use pattern blocks, beads, or drawings to create and extend patterns. Encourage pupils to create their own patterns and explain their reasoning.

Pupils will learn to describe the position of an object with respect to another object using prepositions like inside, outside, above, below, over, under, near, far, before, and after.

Introduce this concept by asking small questions, such as "Where is the clock with respect to the board?" or "Where is the chair with respect to the board?" Rephrase questions based on the classroom environment to ensure pupils understand the meanings of these prepositions. Use interactive activities and games to reinforce the understanding of positional words. For example, create obstacle courses or scavenger hunts where pupils must use positional words to describe the location of objects.

Lesson Plan

Suggested Time: 1 period

Objectives:

To enable students to:

- Recognise and identify 2D shapes (rectangle, square, circle, and triangle) with respect to their characteristics.
- Identify similar basic shapes in daily life.
- Distinguish basic shapes by considering their attributes (sides).
- Classify 2-D shapes according to the number of sides and corners.

Concept Connector:

Pupil may be already familiar with some shapes so, start the lesson with a brainstorming question asking the students which shapes they know that surround them every day? From the rectangular doors they walk through to the circular wheels of their bicycles, 2D shapes are an integral part of daily lives. 2D shapes are flat shapes that have only two dimensions: length and width. They do not have depth or thickness. This chapter will help the students to better recognise and understand the 2D shapes that are all around us.

Exploring the Objective:

Using the example of 2D shapes on ***Page 79*** the textbook to explain to the students the attributes of 2D shapes. 2D shapes can be identified by their unique characteristics, such as the number of sides and corners.The teacher may also use cut-outs or models to describe the characteristics of each shape. To reinforce their concepts, Math Quest on Page 79 can be paired during explanation to help students explore their surroundings and recognise 2D shapes.

Activity

Identify Shapes - Worksheet

How to Play:

- Distribute a worksheet with pictures of real-life objects (for example: a door- rectangle, a slice of pizza - triangle)
- Ask students to identify the 2D shapes they see in each picture.
- Have students describe the attributes of each 2D shape, such as the number of sides, corners, and any other notable features.

Reflection:

- Students demonstrate an understanding of 2D shapes through accurate recognition and identification in real-life objects.

- Students show awareness of 2D shape attributes, including number of sides and corners.
- Students make connections between 2D shapes and their real-life applications

Exercise:

Assign the first question questions on ***Page 80*** of the textbook as classwork for students to complete together with teacher guidance. Then, assign the coloring activity on ***Page 80*** as individual homework, providing an easy-level assessment for students to practice and reinforce their understanding. Moreover, the Math Lab Page 49-50 acts as an extension activity for students to identify 2D shapes around them.

Extension Activity:

The following questions can be given as added practice, worksheet or as reinforcement of the topic.

1. Draw and label five different 2D shapes.
2. Which 2D shape has three sides and three corners?
   a. Square
   b. Triangle
   c. Rectangle
   d. Circle
3. What is the difference between a square and a rectangle? Explain.

Unit 8 Geometry

Learning Objective:

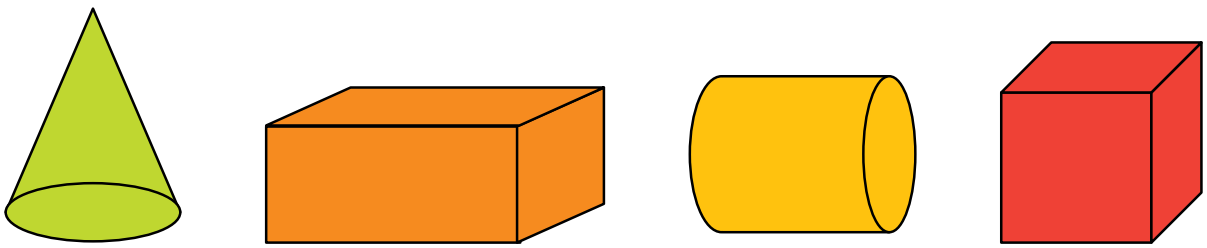
- Distinguish basic shapes by considering their attributes (sides).
- Classify 2-D shapes according to number of sides and corners.
- Identify the following basic shapes:
  - Rectangle
  - Square
  - Circle
  - Triangle

Let's talk math:

- Ask the pupils if they know what a shape is.
- Ask them if they can name any

Make Sure You Have:

- Foam sheets
- Scissors



Activity: Shape Exploration

Duration: 1 Lesson **Whole Class Activity**

Let's Try It:

- Draw four shapes (circle, square, rectangle, triangle) on the board with names below.
- Briefly describe each shape, noting the square has equal sides unlike the rectangle.
- Give each pupil foam paper and scissors to cut out a shape of their choice.
- Ask some pupils why they chose their shape and let them describe it.
- Write their observations on the board without prompting for differences.
- Have pupils copy the differences, including the number of sides and corners for each shape.
- Keep the foam shapes for later use.

Assessment:

- Tell the pupils that you will be reading out some characteristics of each shape, and they should make note of which shape they think you are talking about.
- So, if the first thing you say is "This shape only has no corners", they should write down circle.
- If you say "this shape has two longer and two shorter sides" they should write rectangle.

Name: _____

Date : _____

Division Cards

5 ÷ 5	10 ÷ 5
15 ÷ 5	20 ÷ 5
25 ÷ 5	30 ÷ 5
35 ÷ 5	40 ÷ 5
45 ÷ 5	50 ÷ 5

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Name: _____

Date : _____

Division Cards

10 ÷ 10	20 ÷ 10
30 ÷ 10	40 ÷ 10
50 ÷ 10	60 ÷ 10
70 ÷ 10	80 ÷ 10
90 ÷ 10	100 ÷ 10

Name: _____

Date : _____

Shopping

Alina has the following currency in her wallet.

Rs 10	Rs 20	Rs 50	Rs 100
Rs 10	Rs 20	Rs 50	Rs 100
Rs 10	Rs 20	Rs 50	Rs 100
Rs 10	Rs 20	Rs 50	Rs 100
Rs 10	Rs 20	Rs 50	Rs 500

She is planning to purchase following items.

3 Chocolate bars	Vase	Hairband	Book
			
Rs 90	Rs 340	Rs 70	Rs 500

Decide the mathematical operation for the following purchase.

- Two hairbands = 2 ☐ 70 = Rs _____
- A book and a flower vase = 500 ☐ 340 = Rs _____
- Each bar of chocolate = 90 ☐ 3 = Rs _____
- Make two possible combinations of currency for the price of the flower vase.

Tell the students that money can be added (+), subtracted (–), multiplied (×) and divided (÷). Ask them to decide operation for each statement. Ask them to think about different denominations.	*Addition, Subtraction, Multiplication and Division*

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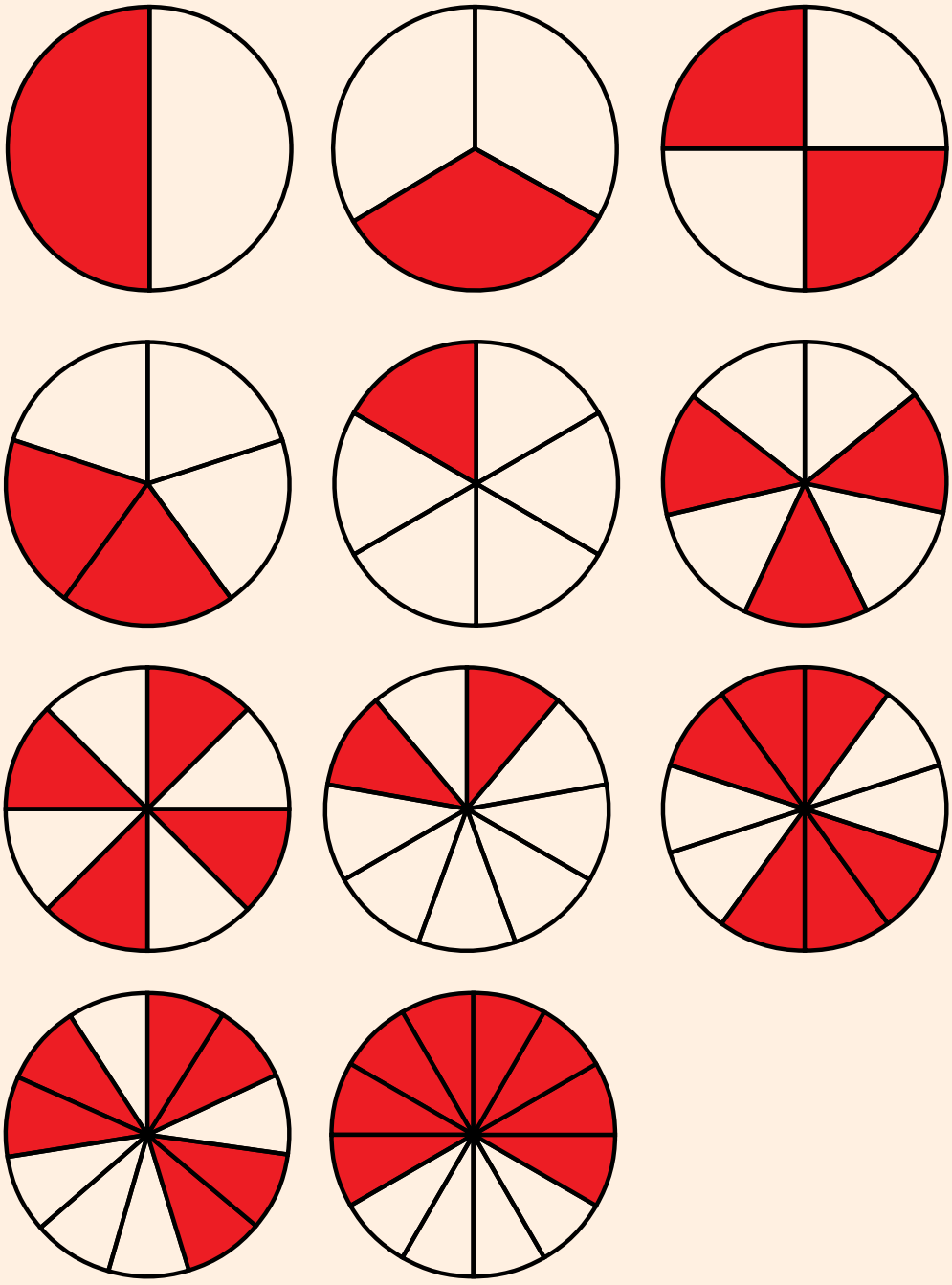
Name: _____

Date : _____

Fraction Discs



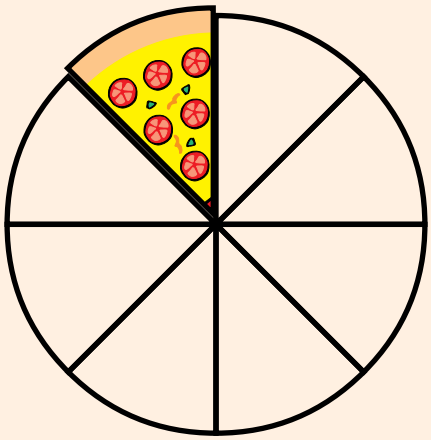
Give the students a scattered bunch of **fractions** that they must **match** to **represent** each of these appropriately.	*Fractions*

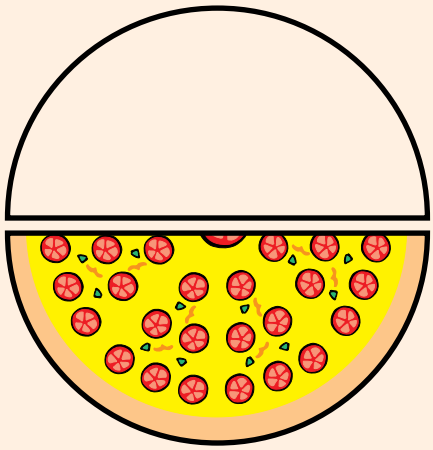
Note: Fraction circles can be used to develop the understanding of fractions.

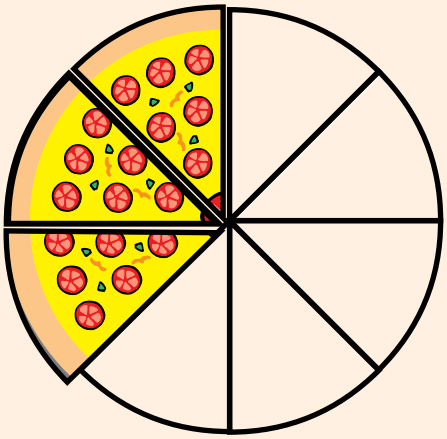
Name: _____

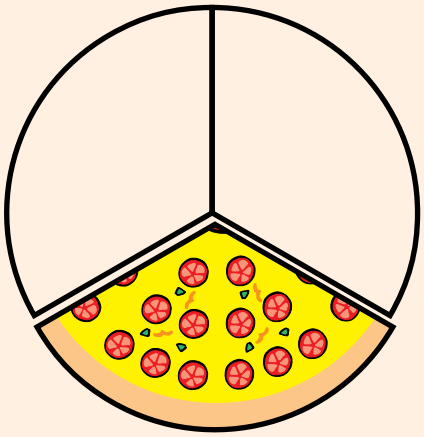
Date : _____

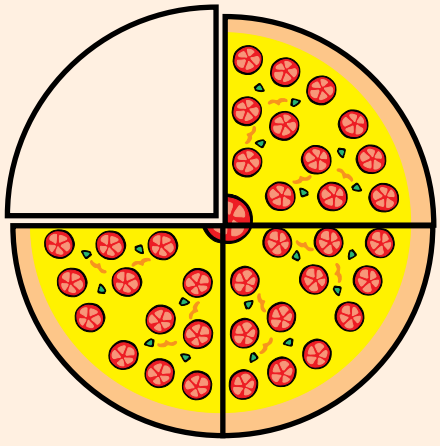
Pizza Party











A pizza pie has 8 slices. Looking at the above figures guess how many slices each fraction represents.	*Fractions*

Note: Fraction circles can be used to explain $\frac{1}{2}, \frac{1}{4}, \ldots$

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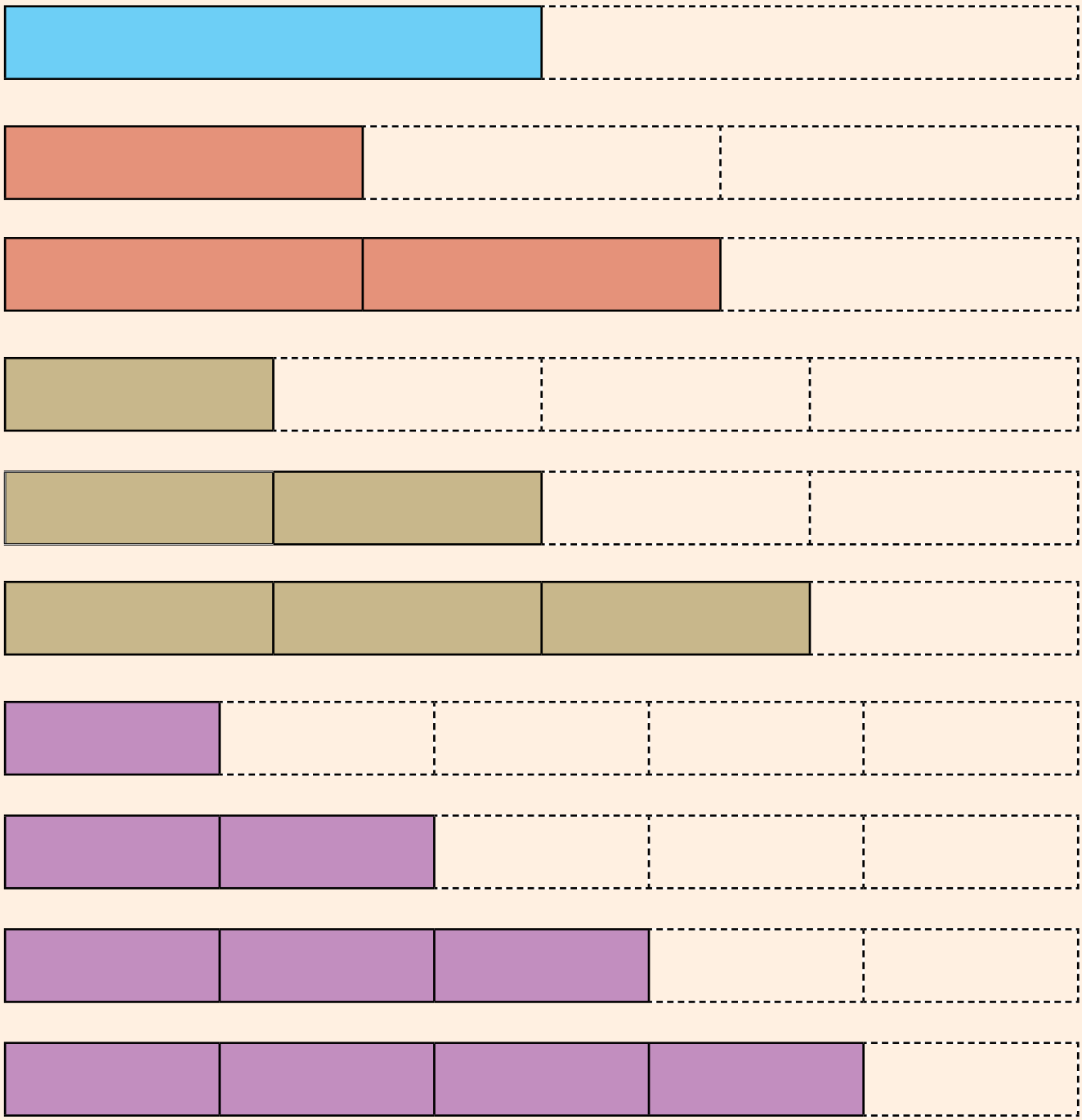
Name: _____

Date : _____

Fractions Bars



Write a **fraction** next to each of the bar models so that it correctly **represents** the shaded part against the whole figure.	*Fractions*

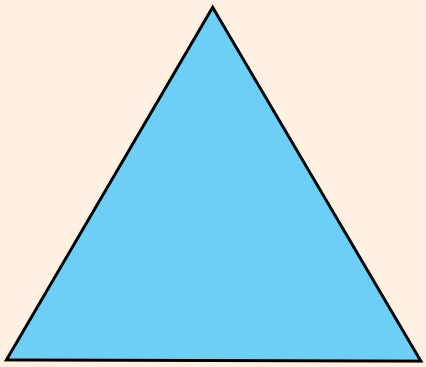
Geometry

Count and write the number of sides and corners for each shape. Also, name the shape.

corners: _____

sides: _____

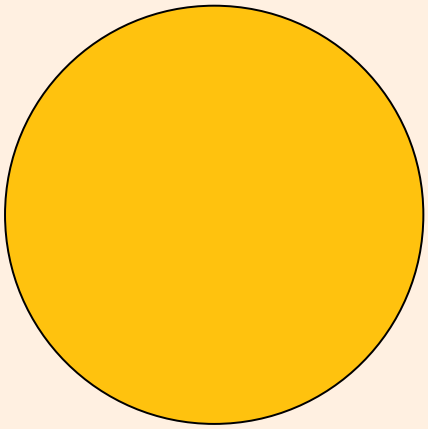
name: _____



corners: _____

sides: _____

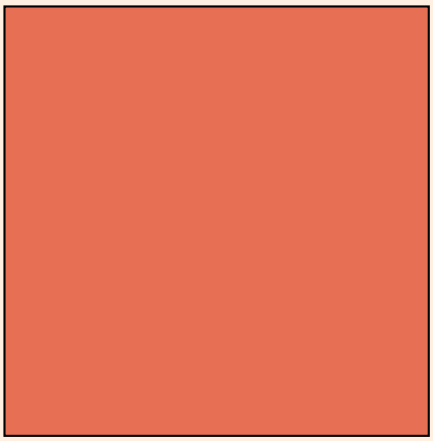
name: _____



corners: _____

sides: _____

name: _____



corners: _____

sides: _____

name: _____

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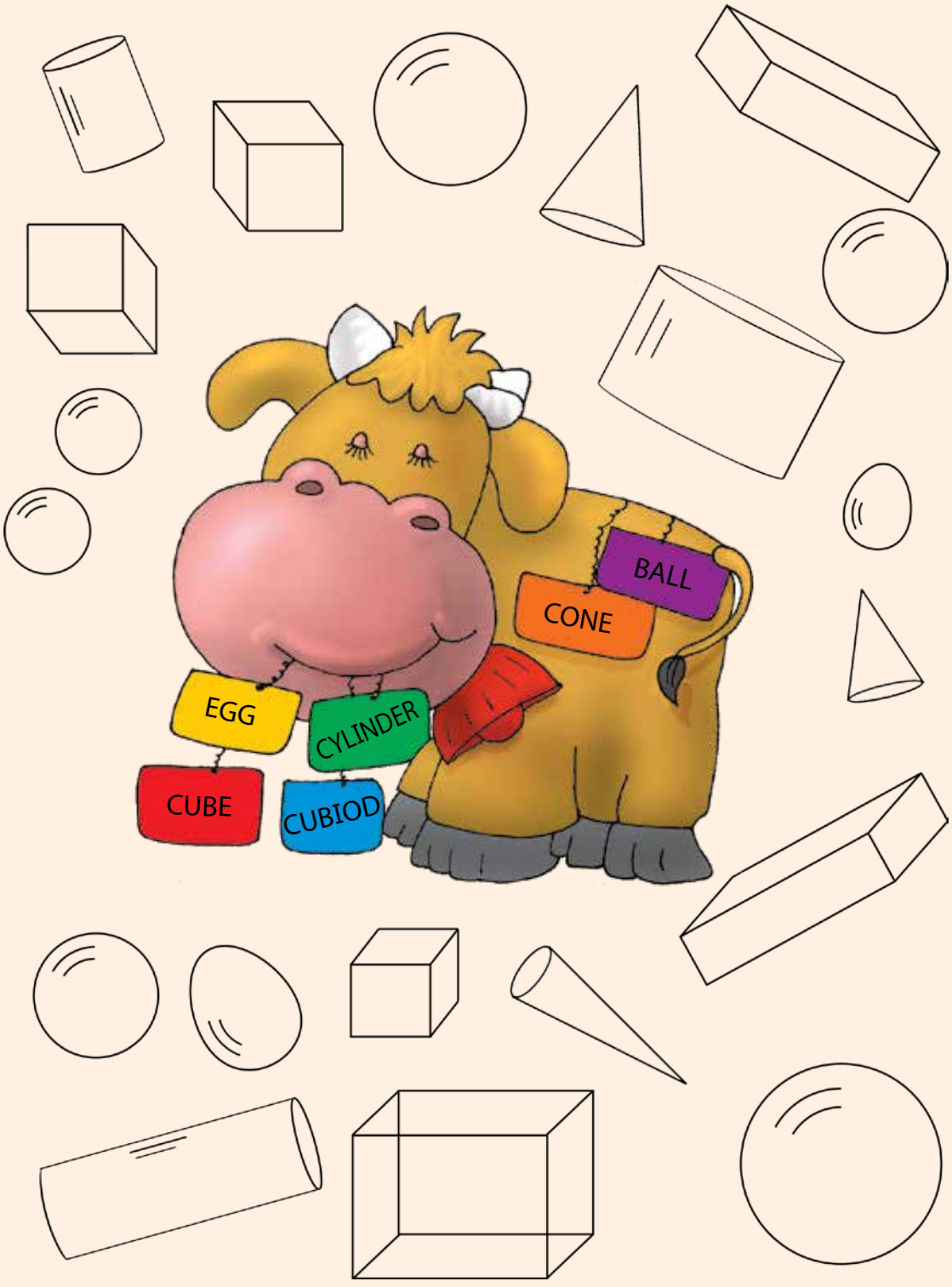
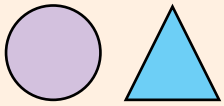
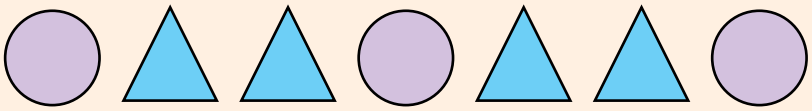
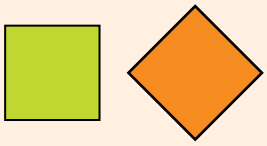
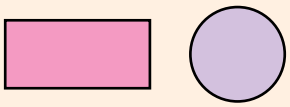
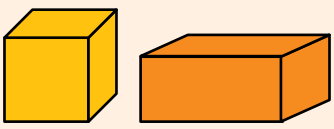
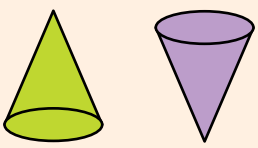
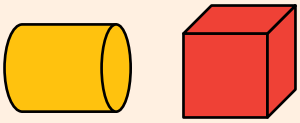
Kelly, the cow, is confused. Help her name the shapes by colouring according to the colours given on the name tags.



Draw patterns of your choice using the given shapes.

Shapes	Patterns
	
	
	
	
	
	

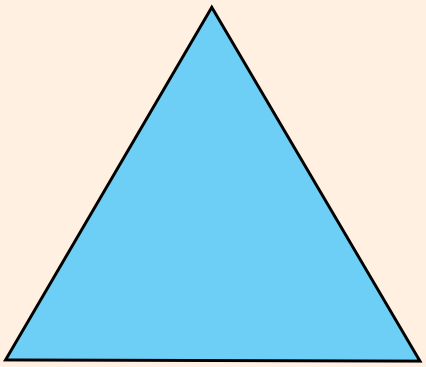
Geometry

Count and write the number of sides and corners for each shape. Also, name the shape.

corners: 4

sides: 4

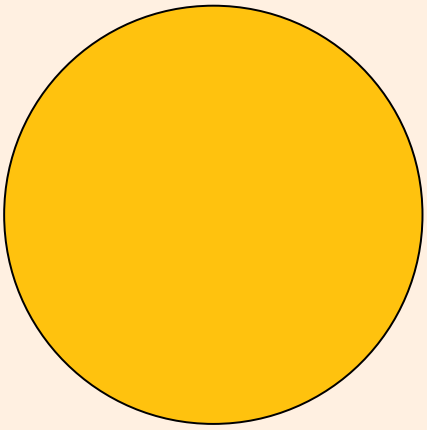
name: Rectangle



corners: 3

sides: 3

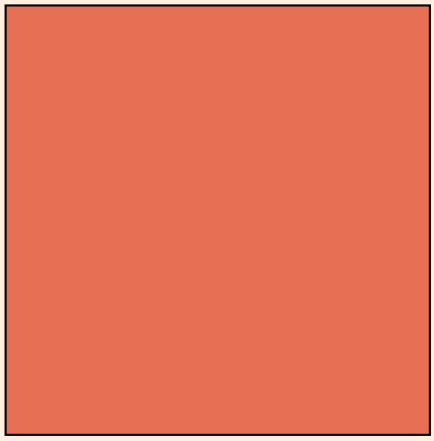
name: Triangle



corners: 0

sides: 0

name: Circle



corners: 4

sides: 4

name: Square

Unit

9 Data Handling and Probability

Learning Framework

Pupils will learn to interpret given pictographs and count the objects shown in them.

Use the example given on page 91 to elaborate pictographs and how number of different objects are shown in a pictograph.

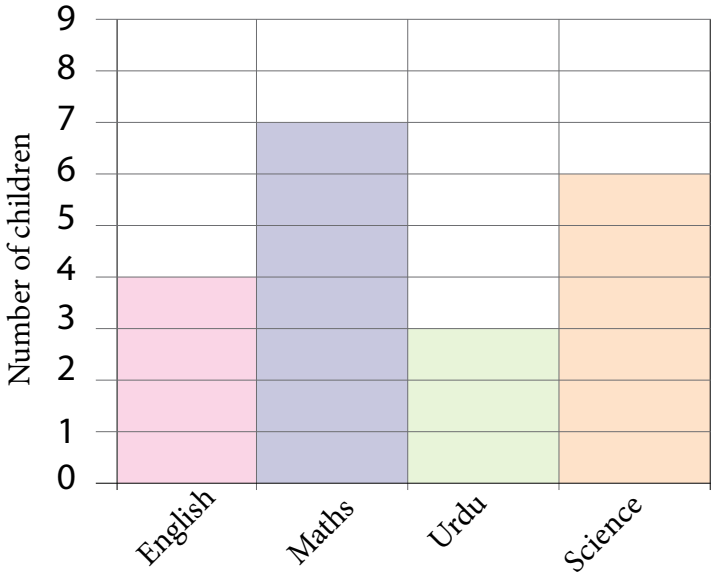
Pupils will learn to write numbers in the form of tally marks and read numbers in the given tally marks.

Fruits sold in a day

Fruits	Tally marks
Oranges	𝍸 𝍸 𝍸 𝍸 ||||
Apples	𝍸 ||||
Strawberries	𝍸 𝍸 |||
Pear	|||

Use the examples given on pages 94 and 95 to elaborate the mechanism of tally marks.

Pupils will learn to interpret block graphs and read information given in the form of a block graph.



Use the block graphs given above to elaborate the working of block graph.

Pupils will learn to describe the probability of an event using the terms: impossible, less likely, or more likely.

Ask your students what does it mean by 'impossible'? Elaborate which events are impossible. Then make a list of 'impossible' and 'non-impossible' events. Then use the following diagram to elaborate 'less likely' and 'more likely' events.

Lesson Plan

Suggested Time: 2 periods

Objectives:

To enable students to:

- Read and interpret data using block graphs.

Concept Connector:

Students have already learnt how to read tally charts. Like tally charts, block graphs are a powerful tool that helps us visualise data. Simply put, a block graph is a chart that uses blocks to represent information, with each block standing for a single unit or item.

Exploring the Objective:

Using the example of block charts on ***Page 96*** of the textbook explain to the students how tally charts can be linked with block charts to show easy representation of data. A block chart is a graphical representation that uses blocks to compare and display data across different groups. The chart consists of two axes: the x-axis; representing the categories or groups, while the y-axis; representing the values or quantities. The number of blocks corresponds to the amount of quantity in a particular group.

Activity

Interpreting Block Graphs

What you need:

- Blocks or counting cubes

How to Play:

- Take a survey in class on any topic of choosing (for example: favorite fruits, favorite cartoon, etc.)
- With the answers from the survey, create a tally chart on the board.
- Ask them to create a block chart on paper with the data mentioned on the board and analyse the block graph and answer the following questions:
  - Which is the most popular?
  - Which is the least popular?
  - How many more students prefer one option than the other option?
- Secondly, to reinforce the concept, provide students with blocks or counting cubes and ask them to create their own block graph to show their favorite.

Reflection:

- Students can identify and describe the data in a block graph.
- Students can link tally chart data with bar charts

- Students can interpret block graphs to answer questions.

Exercise:

Assign the first question of block chart on ***Page 97*** as classwork for students to complete together with teacher guidance. Then, assign the second questions on ***Page 97*** as individual homework, providing a easy-medium assessment for students to practice and reinforce their understanding. Moreover, the ***Math Quest on Page 97*** acts as an extension activity for students to draw and practice block graphs.

Extension Activity:

The following questions can be given as added practice, worksheet or as reinforcement of the topic.

1. Provide students with a worksheet containing different block graphs and ask them to answer questions related to the data.

Data Handling

The pictograph shows number of apples sold in a day.

Apples sold in a day

Monday	
Tuesday	
Wednesday	

Each  represents 2 apples

How many apples were sold on Monday?

How many apples were sold on Tuesday?

How many apples were sold on Wednesday?

How many more apples were sold on Wednesday than on Monday?

How many apples were sold altogether?

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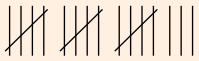
The tally chart shows total number of students present in different grades.

Students in each grade

Grade 1	
Grade 2	
Grade 3	

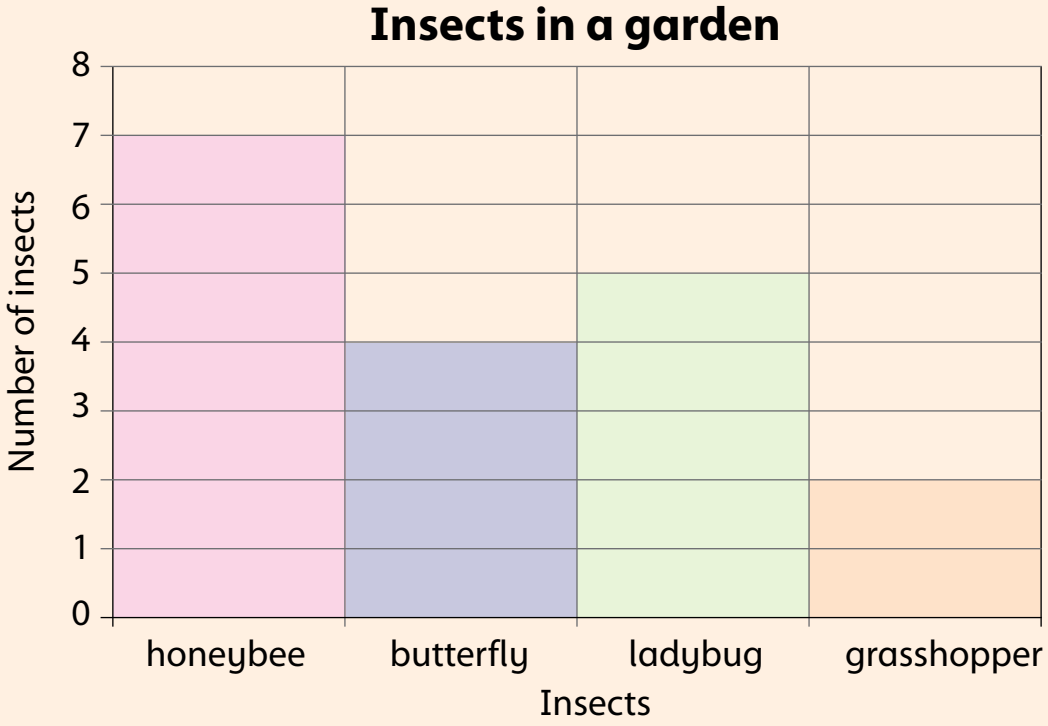
How many students are there in Grade 1?

How many students are there in Grade 2?

How many students are there in Grade 3?

What is the total number of students in all grades?

The block graph shows the number of insects present in the garden.



How many honeybees were there?

How many butterflies were there?

How many more ladybugs were there than grasshopper?

Which insect was the greatest in number?

Data Handling

The pictograph shows number of apples sold in a day.

Apples sold in a day

Monday	
Tuesday	
Wednesday	

Each  represents 2 apples

How many apples were sold on Monday? 10

How many apples were sold on Tuesday? 8

How many apples were sold on Wednesday? 12

How many more apples were sold on Wednesday than on Monday? 2

How many apples were sold altogether? 30

The tally chart shows total number of students present in different grades.

Students in each grade

Grade 1	𝍸 𝍸 𝍸 | | |
Grade 2	𝍸 𝍸 𝍸 𝍸 | |
Grade 3	𝍸 𝍸 𝍸 𝍸 𝍸

How many students are there in Grade 1?

18

How many students are there in Grade 2?

22

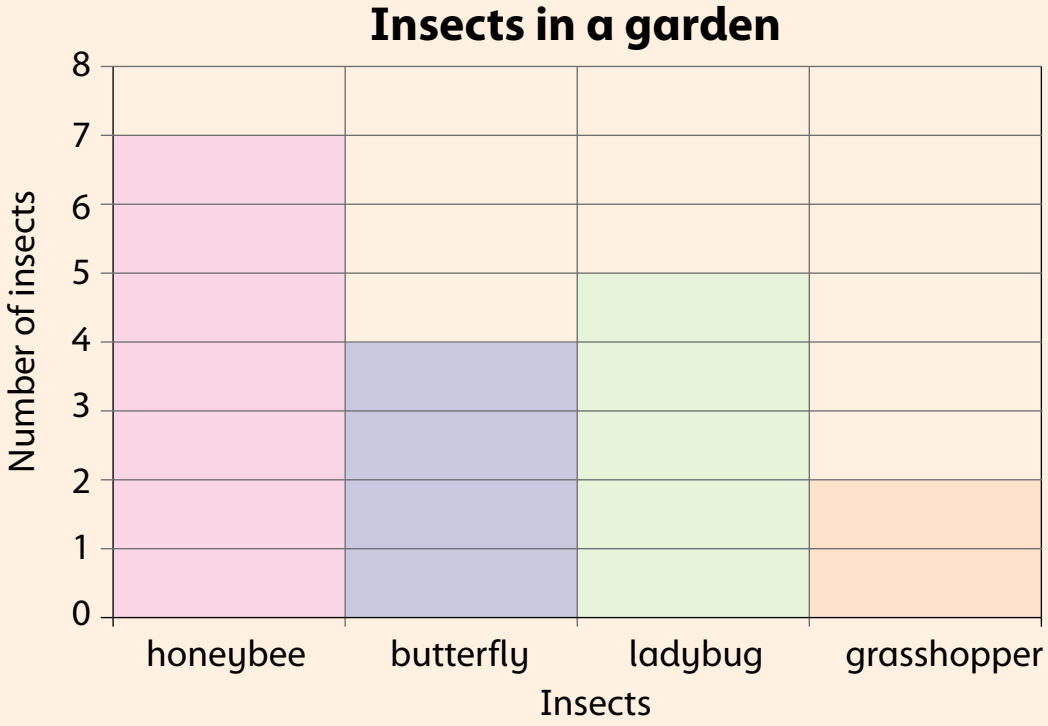
How many students are there in Grade 3?

25

What is the total number of students in all grades?

65

The block graph shows the number of insects present in the garden.



How many honeybees were there?

7

How many butterflies were there?

4

How many more ladybugs were there than grasshopper?

1

Which insect was the greatest in number?

Honeybee

Unlocking the Power of Math: The Essential Glossary

A glossary in mathematics is a valuable tool that enhances learning and understanding. It serves as a reference guide, providing clear definitions and explanations of mathematical terms and concepts. Here are some key reasons why a glossary is important in math:

Clarity and Understanding: A glossary helps students understand the precise meaning of mathematical terms. This clarity is crucial because math often involves complex and abstract concepts. By having a glossary, students can quickly look up definitions and ensure they are using terms correctly.

Consistency: Mathematical language needs to be consistent. A glossary ensures that everyone uses the same definitions and understands terms in the same way. This consistency is important for effective communication, whether in the classroom, in textbooks, or in discussions.

Learning Aid: For students, a glossary is an essential learning aid. It helps them review and reinforce their understanding of key terms. When studying or doing homework, students can refer to the glossary to refresh their memory and clarify any doubts.

Problem-Solving: Understanding the terminology is the first step in solving math problems. A glossary helps students decode the language of math problems, making it easier to identify what is being asked and how to approach the solution.

Confidence Building: Having a glossary at hand can boost students' confidence. Knowing that they can easily find the meaning of unfamiliar terms reduces anxiety and encourages them to tackle challenging problems without fear of misunderstanding.

Accessibility: A glossary makes mathematical knowledge more accessible. It breaks down barriers for students who might struggle with the language of math, providing them with a tool to independently explore and understand new concepts.

In summary, a glossary in mathematics is an indispensable resource that supports clarity, consistency, learning, problem-solving, confidence, and accessibility. It empowers students to navigate the language of math with ease and enhances their overall learning experience.

Glossary

add: to combine two or more numbers together.
addition: the process of adding two numbers.
analogue clock: a clock that shows time based on the movement of the hour and minute hand.
ascending order: to arrange numbers from greater to smaller value.
block graph: a method of representing data in a graph using blocks.
capacity: the amount of liquid a container can hold.
clock: a device that shows time.
compare: to decide if one number is greater, smaller, or equal to another number.
currency: the official money used by a country.
decreasing order: to arrange numbers from smaller to greater value.
degree celsius: the unit for measuring temperature.
descending order: to arrange numbers from smaller to greater value.
digital clock: a clock that shows time in numbers.
divide: to equally group or share an amount.
division: the process or equal grouping or sharing.
equal to: same in quantity or amount.
fraction: an equal part of a whole.
half: one of the two equal parts of a whole.
height: a measure of how tall an object is.
hour: a unit of time.
hundreds: place value of a digit in a number that is on the left of tens.
impossible: the chance of an event not occurring at all.
increasing order: to arrange numbers from smaller to greater value.
Islamic calendar: a calendar based on the phases of the moon.
length: a measure of how long an object is.
less: smaller in amount or quantity.
less likely: the less chance of an event happening.
mass: a measure of how heavy an object is.
minute: a unit of time.
more: greater in amount of quantity.
more likely: the more chance of an event happening
multiplication: the process of repeatedly adding the same number.
multiply: to repeatedly add equal group of numbers together.
o'clock: time when the minute hand points at 12.
ones: place value of a digit on the most right of a number.
order: to arrange numbers or objects in a particular manner.
ordinal numbers: a number that refers to the position of an object in a series.

patterns: an arrangement of shape, figures, and objects that repeat in a specific order.

pictograph: a method of representing data or information using symbols or pictures.

place value: the value of a digit in a number according to its position.

positions: the place of an object in relation to another object.

probability: the chance of an event happening.

product: the result of multiplying two or more numbers.

quarter: one of the four equal parts of a whole.

solar calendar: a calendar based on the rotation of the sun.

subtract: to take away a number from another number.

subtraction: the process of taking away a number from another number.

sum: the result of adding two or more numbers.

tally chart: a method of collecting and recording data using tally marks.

tally marks: a method of counting data.

temperature: a measure of how hot an object is.

tens: place value of a digit in a number that is on the left of ones.

thermometer: a device for measuring temperature.

three-dimensional (3D) shape: a solid shape that has length, width, and height.

three-quarters: three of the four equal parts of a whole.

two-dimensional (2D) shapes: a flat shape that only has length and width.

two-quarters: two of the four equal parts of a whole.