



THE PRESIDENT'S
RECOVERY
PRIORITIES

Education

Ministry of
Education,
Science and
Technology

Lesson plans for
PRIMARY
Mathematics

4
CLASS

1
TERM

Foreword

Our country's future lies in the education of our children. The Government of Sierra Leone is committed to doing whatever it takes to secure this future.

As Minister of Education, Science and Technology since 2007, I have worked every day to improve our country's education. We have faced challenges, not least the Ebola epidemic which as we all know hit our sector hard. The Government's response to this crisis – led by our President – showed first-hand how we acted decisively in the face of those challenges, to make things better than they were in the first place.

One great success in our response was the publication of the Accelerated Teaching Syllabi in August 2015. This gave teachers the tools they needed to make up for lost time whilst ensuring pupils received an adequate level of knowledge across each part of the curriculum. The Accelerated Teaching syllabi also provided the pedagogical resource and impetus for the successful national radio and TV teaching programs during the Ebola epidemic.

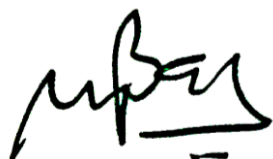
It is now time to build on this success. I am pleased to issue new lesson plans across all primary and JSS school grades in Language Arts and Mathematics. These plans give teachers the support they need to cover each element of the national curriculum. In total, we are producing 2,700 lesson plans – one for each lesson, in each term, in each year for each class. This is a remarkable achievement in a matter of months.

These plans have been written by experienced Sierra Leonean educators together with international experts. They have been reviewed by officials of my Ministry to ensure they meet the specific needs of the Sierra Leonean population. They provide step-by-step guidance for each learning outcome, using a range of recognised techniques to deliver the best teaching.

I call on all teachers and heads of schools across the country to make best use of these materials. We are supporting our teachers through a detailed training programme designed specifically for these new plans. It is really important that these Lesson Plans are used, together with any other materials you may have.

This is just the start of education transformation in Sierra Leone. I am committed to continue to strive for the changes that will make our country stronger.

I want to thank our partners for their continued support. Finally, I also want to thank you – the teachers of our country – for your hard work in securing our future.



Dr. Minkailu Bah

Minister of Education, Science and Technology

Table of Contents

Lesson 1: Counting up to 5000 Using a Number Line	2
Lesson 2: Counting up to 10,000 Using a Number Line	4
Lesson 3: Place Value up to 10,000	6
Lesson 4: Comparing Numbers up to 10,000 Using Place Value	8
Lesson 5: Reading and Writing Numbers in Numerals up to 10,000 Using Place Value	10
Lesson 6: Ordering Whole Numbers up to 10,000	12
Lesson 7: Rounding Whole Numbers to the Nearest 10	15
Lesson 8: Rounding Whole Numbers to the Nearest 100	17
Lesson 9: Factors of Numbers up to 10	19
Lesson 10: Factors of Numbers up to 20	21
Lesson 11: Common Factors of Numbers up to 10	23
Lesson 12: Common Factors of Numbers up to 20	25
Lesson 13: Revision of Addition and Subtraction up to 1000	27
Lesson 14: Addition to 10,000	30
Lesson 15: Subtraction up to 10,000	32
Lesson 16: Multiplication	34
Lesson 17: Story Problems Using All Four Operations	36
Lesson 18: Solve Story Problems Using All Four Operations	38
Lesson 19: Inverse Operations	40
Lesson 20: Inverse Operations	42
Lesson 21: Measurements of Objects in Centimetres	44
Lesson 22: Measurement of Objects in Metres	46
Lesson 23: Measurement of Objects in Feet	48
Lesson 24: Word Problems about Length of Small Objects (Centimetres)	50
Lesson 25: Word Problems About the Length of Small Objects (Centimetres)	52
Lesson 26: Measuring the Perimeter of Objects Using Centimetres	54
Lesson 27: Measuring the Perimeter of Objects Using Centimetres and Metres	56
Lesson 28: Calculating Perimeter for Rectangles in Centimetres	58
Lesson 29: Calculating Perimeter for Squares in Centimetres	60
Lesson 30: Calculating Perimeter for Triangles in Centimetres	62














Lesson 31: Calculate Area of Objects by Counting Squares	64
Lesson 32: Calculating Area for Rectangles in cm^2 and m^2	66
Lesson 33: Calculating Area for Squares in cm^2 and m^2	68
Lesson 34: Understanding the Relationship Between Area and Perimeter	70
Lesson 35: Word Problems About Area and Perimeter	72
Lesson 36: Estimating Mass Comparatively Using Non-Standard Measurement	74
Lesson 37: Calculating Mass Using Kilograms	76
Lesson 38: Converting Mass: Kilograms and Local Measurement	78
Lesson 39: Word Problems About Mass Using Addition and Subtraction	80
Lesson 40: Word Problems About Mass Using Four Operations	82
Lesson 41: Using Sticks to Find and Describe Number Patterns	84
Lesson 42: Using the 100-number Square to Find and Describe Number Patterns	86
Lesson 43: Using a Calendar to Find and Describe Number Patterns	89
Lesson 44: Representing Number Patterns Visually	91
Lesson 45: Finding and Describing Patterns out of Class	93
Lesson 46: Finding the Missing Term in Number Patterns	95
Lesson 47: Writing Rules for Number Patterns in Words	97
Lesson 48: Multiplication Using the 7 and 8 Times Table	99
Lesson 49: Multiplication Using the 9 and 10 Times Table	101
Lesson 50: Long Multiplication (2-Digit by 1-Digit Number) without Renaming	103
Lesson 51: Long Multiplication (2-Digit by 1-Digit Numbers) with Renaming	105
Lesson 52: Long Multiplication (3-Digit by 1-Digit Numbers) without and with Renaming	107
Lesson 53: Long Multiplication (3-Digit by 2-Digit Numbers) without Renaming	109
Lesson 54: Long Multiplication (3-Digit by 1-Digit Numbers) with Renaming	111
Lesson 55: Long Multiplication (4-Digit by 1-Digit Numbers) without and with Renaming	113
Lesson 56: Division of a 2-Digit Whole Number by a 1-Digit Number without a Remainder Using Long Division	115
Lesson 57: Division of a 2-Digit Whole Number by a 1-Digit Number with Remainder Using Long Division	118
Lesson 58: Checking Division Calculations without Remainder by Using Estimation	120

Lesson 59: Division of a 3-Digit Whole Number by 1-Digit Number without
Remainder Using Long Division 122




Lesson 60: Division of a 3-Digit Whole Number by a 1-Digit Number with Remainder
Using Long Division 124

Introduction to the Lesson Plan Manual

These lesson plans are based on the National Curriculum and meet the requirements established by the Ministry of Education, Science and Technology.

- 1  The lesson plans will not take the whole term, so use spare time to review material or prepare for exams
 - 2  Teachers can use other textbooks alongside or instead of these lesson plans.
 - 3  Read the lesson plan before you start the lesson. Look ahead to the next lesson, and see if you need to tell pupils to bring materials for next time.
 - 4  Make sure you understand the learning outcomes, and have teaching aids and other preparation ready – each lesson plan shows these using the symbols on the right.
 - 5  Quickly review what you taught last time before starting each lesson.
 - 6  Follow the suggested time allocations for each part of the lesson. If time permits, extend practice with additional work.
 - 7  Lesson plans have a mix of activities for the whole class and for individuals or in pairs.
 - 8  Use the board and other visual aids as you teach.
 - 9  Interact with all students in the class – including the quiet ones.
 - 10  Congratulate pupils when they get questions right! Offer solutions when they don't, and thank them for trying.
-  Learning outcomes
 Teaching aids
 Preparation

Lesson Title: Counting up to 5000 Using a Number Line	Theme: Knowing and Understanding Numbers up to 10,000	
Lesson Number: M-04-001	Class/Level: Primary 4	Time: 35 minutes

	<p>Learning Outcomes By the end of the lesson, pupils will be able to:</p> <ol style="list-style-type: none"> Count by 100s forward to and backward from 5000. Count by 500s forward to and backward from 5000. Identify that the digit in the hundreds place changes when counting by 100s. 		<p>Teaching Aids Number lines</p>		<p>Preparation Draw 5 number lines on the board: the first counts in 100s from 100 to 1000, the second counts in 100s from 1100 to 2000, the third counts in 100s from 2100 to 3000, the fourth counts in 100s from 3100 to 4000 and the fifth counts in 100s from 4100 to 5000.</p>
---	--	---	--	---	---

Opening (3 minutes)

- Review skip counting. **Say:** Skip counting is when you count in groups instead of counting by 1. For example, you skip count in 5s by counting 5, 10, 15. You skip count in 10s by counting 10, 20, 30.
- Ask:** When is it useful to skip count? Think silently for 10 seconds.
- Say:** Now turn to a partner and say 1 idea about when it is useful to skip count.
- After pupils have had a chance to say 1 idea to a partner, ask a few pupils to share their ideas with the class. (Example answers: counting money; counting a lot of objects; counting people)
- Count in 5s as a class. **Say:** Now we will skip count in 5s to 50 out loud together. Ready, begin: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50. Very good!
- Count in 10s as a class. **Say:** Now we will skip count in 10s to 200 out loud together. Ready, begin: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200. Very good!

Introduction to the New Material (10 minutes)

- Say:** Today we will learn to skip count in 100s and 500s to 5000. We will find out what digit in the number changes when we skip count in 100s and 500s.
- Point to the first number line, which shows counting in 100s from 100 to 1000. **Say:** Now we will skip count in 100s to 1000. I will point to each number as we count. Look to see which place value has a digit that changes. Ready, begin: 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000.
- Say:** When we count in 100s, the digit in the hundreds place changes.
- Underline the digit that changed in each number from 100 to 900: 100, 200, 300, 400, 500, 600, 700, 800, 900. Explain that a thousand is 10 hundreds and underline 1000.
- Point to the second number line, which shows counting in 100s from 1100 to 2000. **Say:** Now we will skip count in 100s from 1100 to 2000. I will point to each number as we count. Look to see which place value has a digit that changes. Ready, begin: 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000.
- Say:** When we skip count in 100s the digit in the hundreds place changes.
- Underline the digit that changed in each number from 1100 to 1900: 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900. Explain that 2 thousand is 20 hundreds and underline 2000.

8. Use the other number lines to count in 100s from 2100 to 5000 with the class.
9. Use the number lines to count backward from 5000 to 100 with the class.
10. Circle the numbers on the number lines you will use to count in 500s.
11. **Say:** Now we will count in 500s. Counting in 500s is just like counting in 5s. I will point to the numbers as we count in 500s. Ready, begin: 500, 1000, 1500, 2000, 2500, 3000, 3500, 4000, 4500, 5000. Now we will count backwards in 500s. Ready, begin: 5000, 4500, 4000, 3500, 3000, 2500, 2000, 1500, 1000, 500.

Guided Practice (10 minutes)

1. Ask pupils to copy the number line with the numbers from 2100 to 3000 in their exercise books.
2. **Ask:** What place value has a digit that always changes when we count in 100s? Raise your hand to answer. (Answer: the hundreds place)
3. Ask pupils to look at 2100 and 2200. **Ask:** What digit changed? Raise your hand to answer. (Answer: The 1 changed to a 2.) **Ask:** What place value are the 1 and 2 in? Raise your hand to answer. (Answer: the hundreds place)
4. Have pupils underline the digit that changes in each number from 2100 to 2900.
5. Ask pupils to place their right pointer fingers at the beginning of the number line they drew. Have them point to each number as they read it out loud. **Ask:** What happens to the numbers when we read them from left to right? Raise your hand to answer. (Answer: The numbers get bigger by 100.)
6. Ask pupils to place their right pointer fingers at the end of the number line they drew. Have them point to each number as they read it out loud. **Ask:** What happens to the numbers when we read them from right to left? Raise your hand to answer. (Answer: The numbers get smaller by 100.)




Independent Practice (10 minutes)

1. **Write** on the board:
 - a) 2200, ____, 2400, ____, 2600
 - b) ____, 4300, 4400, ____, 4600, ____
 - c) ____, ____, 1000, ____
 - d) 500, 1000, ____, ____, 2500
2. Pupils copy these in their exercise books and fill in the blank spaces with the correct numbers.

Closing (2 minutes)

1. **Say** and **write** the answer: As a class, complete and read aloud the number patterns on the board from independent practice.
 - a) 2200, 2300, 2400, 2500, 2600
 - b) 4200, 4300, 4400, 4500, 4600, 4700
 - c) 800, 900, 1000, 1100
2. **Say:** Good job today, pupils! You learned how to count forward and backward by 100 or 500.

Lesson Title: Counting up to 10,000 Using a Number Line	Theme: Knowing and Understanding Numbers up to 10,000	
Lesson Number: M-04-002	Class/Level: Primary 4	Time: 35 minutes

 <p>Learning Outcomes By the end of the lesson, pupils will be able to:</p> <ol style="list-style-type: none"> 1. Count in 1000s forward to and backward from 10,000. 2. Count in 2000s and 5000s forward to and backward from 10,000. 3. Identify that the digit in the thousands place changes when counting by 1000s. 	 <p>Teaching Aids Number lines</p>	 <p>Preparation Draw 3 number lines on the board: the first counts in 1000s from 1000 to 10,000, the second counts in 1000s from 1200 to 9200, the third counts in 1000s from 1500 to 9500.</p>
---	--	---

Opening (2 minutes)

1. Connect to previous lesson. **Say:** Skip counting is when you count in groups instead of counting by 1. For example, yesterday we skip counted in 100s and 500s.
2. Count in 2s as a class. **Say:** Now we will skip count in 2s to 10 out loud together. Ready, begin: 2, 4, 6, 8, 10. Very good!
3. Count in 100s as a class. **Say:** Now we will skip count in 100s to 2000 out loud together. Ready, begin: 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000. Very good!
4. **Say:** Today you will learn how to count in 1000s, 2000s and 5000s forward to and backward from 10,000.

Introduction to the New Material (10 minutes)

1. Point to the first number line, which shows counting in 1000s from 1000 to 10,000. **Say:** Now we will skip count in 1000s to 10,000. I will point to each number as we count. Look to see which place value has a digit that changes. Ready begin: 1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, 9000, 10,000.
2. **Say:** When we count in 1000s, the digit in the thousands place changes.
3. Underline the digit that changed in each number from 1000 to 9000: 1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, 9000. Explain that 10,000 is 10 one thousands and underline 10,000.
4. Point to the second number line, which shows counting in 1000s from 1200 to 9200. **Say:** Now we will skip count in 1000s from 1200 to 9200. I will point to each number as we count. Look to see which place value has a digit that changes. Ready, begin: 1200, 2200, 3200, 4200, 5200, 6200, 7200, 8200, 9200.
5. **Say:** When we skip count in 1000s, the digit in the thousands place changes.
6. Underline the digit that changed in each number from 1200 to 9200: 1200, 2200, 3200, 4200, 5200, 6200, 7200, 8200, 9200.
7. Use the third number line to count aloud with the class from 1500 to 9500 in 1000s.
8. Use the number lines to count backward with the class.

9. Circle the numbers on the number lines you will use to count in 2000s. You will point to them as you count. **Say:** Now we will count in 2000s Counting in 2000s is just like counting in 2s. Use each number line to count forward and backward in 2000s.
10. Use the first number line to count in 5000s to 10,000 with the class.

Guided Practice (10 minutes)

1. Ask pupils to copy the number line with the numbers from 1200 to 9200 in their exercise books.
2. **Ask:** What place value has a digit that always changes when we count in 1000s? Raise your hand to answer. (Answer: the thousands place)
3. Ask pupils to look at 1200 and 2200. **Ask:** What place value did the digit change in? Raise your hand to answer. (Answer: The 1 in the thousands place changed to a 2.) **Ask:** What happened to the digits in the hundreds place? Raise your hand to answer. (Answer: They stayed the same.)
4. Have pupils underline the digit that changes in each number from 2100 to 2900.
5. Ask pupils to place their right pointer fingers at the beginning of the number lines they drew. Have them point to each number as they read it out loud. **Ask:** What happens to the numbers when we read them from left to right? Raise your hand to answer. (Answer: The numbers get bigger by a thousand.)
6. Ask pupils to place their right pointer fingers at the end of the number line they drew. Have them point to each number as they read it out loud. **Ask:** What happens to the numbers when we read them from right to left? Raise your hand to answer. (Answer: The numbers get smaller by a thousand.)




Independent Practice (10 minutes)

1. **Write** on the board:
 - a) 2100, ____, 4100, ____, 6100
 - b) ____, 5300, 6300, ____, 8300, ____
 - c) 2000, ____, 6000, ____, 10,000
 - d) 8000, ____, 6000, 5000, ____, 3000
2. Pupils copy these in their exercise books and fill in the blank spaces with the correct numbers.

Closing (3 minutes)

1. As a class, complete the number patterns on the board and read them aloud as a class.
 - a) 2100, 3100, 4100, 5100, 6100
 - b) 4300, 5300, 6300, 7300, 8300, 9300
 - c) 2000, 4000, 6000, 8000, 10,000
 - d) 8000, 7000, 6000, 5000, 4000, 3000
2. **Say:** Good job today, pupils! You skip counted up to 10,000!

Lesson Title: Place Value up to 10,000	Theme: Knowing and Understanding Numbers up to 10,000	
Lesson Number: M-04-003	Class/Level: Primary 4	Time: 35 minutes

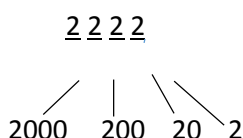
 Learning Outcomes By the end of the lesson, pupils will be able to tell the place value of any digit in a number up to 10,000.	 Teaching Aids None	 Preparation None
--	--	--

Opening (3 minutes)

1. Use a choral chant to revise skip counting in 100s and 1000s aloud as a class.
2. Tell pupils you will count how many fingers are in the class by counting in 10s. Have pupils stand and hold up their hands. Ask a pupil to start. The first pupil says '10' and sits down. The next pupil says '20' and sits down. The next pupil says '30' and sits down. Pupils continue to count in 10s until each pupil has had a turn.
3. **Say:** We learned that counting in 1000s changes the digit in the thousands place. Counting in 100s changes the digit in the hundreds place. **Ask:** When we count in 10s, what changes? Raise your hand to answer. (Answer: the digit in the tens place)
4. **Say:** Today you will learn how to tell the place value of any digit in a number up to 10,000.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn to tell the place value of each digit in a number. Place value means the location and value a digit holds in a number.
2. Write the number 2222 on the board.
3. Read 2222 to the class. **Say:** two thousand, two hundred, twenty-two.
4. **Say:** When I say the number 2222, the first value I hear is 2000. The first 2 is in the **thousands** place and has a value of 2000.
5. Underline the first 2. Write 2000 under it. Draw a line from the 2000 to the first 2.
6. **Say:** Two thousand, two hundred, twenty-two. First, I hear 2000. Then, I hear 200.
7. Underline the second 2. Write 200 under it. Draw a line from the 200 to the second 2.
8. **Say:** When I say the number 2222, the second value I hear is 200. The second 2 is in the **hundreds** place. It has a value of 200.
9. **Say:** Two thousand, two hundred, twenty-two. First, I hear 2000. Then, I hear 200. Then I hear 20. Underline the third 2. Write 20 under it. Draw a line from the 20 to the third 2 in 2222.
10. **Say:** When I say the number 2222, the third value I hear is 20. The third 2 is in the **tens** place. It has a value of 20.
11. **Say:** Two thousand, two hundred, twenty-two. The last value I hear is 2. The last 2 is in the **ones** place. It has a value of 2.
12. Underline the last 2. Write 2 under it. Draw a line from the 2 to the last 2 in 2222.



13. **Say:** As you can see, each digit in a number holds a specific place value. The 2 in each place has a value based on the place it holds.
14. **Say and write:** Let's review the place value for the number 10,000

Place Value	Ten Thousands Place	Thousands Place	Hundreds Place	Tens Place	Ones Place
Digit	1	0	0	0	0

Guided Practice (10 minutes)

- Put pupils in pairs.
- Write** the following on the board: 'Find the place value and the value of the underlined digit:'
 - 826 (Answer: hundreds, 800)
 - 8963 (Answer: thousands, 8,000)
 - 1648 (Answer: ones, 8)
 - 6781 (Answer: tens, 80)
 - 80,814 (Answer, ten thousands, 80,000)
- Give pupils time to complete the 5 problems with their partner. Allow quiet talking and discussion among pupils. Walk around and assist. Answer questions as necessary.
- Invite 5 pupils to come to the board and show their work. Instruct the other students to check their work while students complete the work on the board.




Independent Practice (10 minutes)

- Write** the following on the board: 'Find the place value and the value of the underlined digit:'
 - 725 (Answer: ones, 5)
 - 6,953 (Answer: tens, 50)
 - 2,548 (Answer: hundreds, 500)
 - 5,981 (Answer: thousands, 5,000)
 - 56,325 (Answer: ten thousands, 50,000)
- Tell pupils to copy these in their exercise books and answer the problems individually.
- Have pupils to exchange their notebooks and check each others answers as you read them aloud.

Closing (2 minutes)

- Ask:** What is the difference between value and place value? Raise your hand to answer. (Answer: Place value is the place a digit holds in a number and its value is the amount it represents.)
- Say:** Remember, the place value tells us what the value of the digit is. In 555, the 5 in the tens place means 5×10 which equals a value of 50.
- Say:** Good job today, pupils! You can now tell the place value and value of digits up to 10,000.

Lesson Title: Comparing Numbers up to 10,000 Using Place Value	Theme: Knowing and Understanding Numbers up to 10,000	
Lesson Number: M-04-004	Class/Level: Primary 4	Time: 35 minutes

	<p>Learning Outcomes By the end of the lesson, pupils will be able to use place value to compare numbers up to 10,000.</p>		<p>Teaching Aids Five steps to compare numbers using place value</p>		<p>Preparation Write the 5 steps to compare numbers using place value on the board.</p>
---	---	---	---	---	--

Opening (3 minutes)

1. **Write** 'more than' and 'bigger than' on the board.
2. **Say:** 'More than' and 'bigger than' mean the same thing.
3. **Ask:** What is a number that is 1 bigger than 5? Raise your hand to answer. (Answer: 6)
4. **Ask:** What is a number that is 1 more than 10? Raise your hand to answer. (Answer: 11)
5. **Write** 'less than' and 'smaller than' on the board.
6. **Say:** 'Less than' and 'smaller than' mean the same thing.
7. **Ask:** What is a number that is 1 smaller than 5? Raise your hand to answer. (Answer: 4)
8. **Ask:** What is a number that is 1 less than 10? Raise your hand to answer. (Answer: 9)
9. **Write** ' $10 > 9$ ' and ' $9 < 10$ ' on the board. Tell pupils that the large part of the arrow is near is the larger number. The small part of the arrow is pointing at the smaller number.
10. **Say:** Today we will learn to use place value to see if a number is more or less than another number.

Introduction to the New Material (10 minutes)

1. **Ask:** Which is worth more, 100Le or 1000Le? Raise your hand to answer. (Answer: 1000Le) **Say:** That's right. 1000Le is worth more.
2. **Write** on the board ' $1000 > 100$ '. **Say:** I see 1000 has 4 place values. I see 100 has 3 place values. One thousand has more place values than 100. The number with more place values is always more.
3. **Ask:** Which is worth less, 1000Le or 10,000Le? Raise your hand to answer. (Answer: 1000Le) **Say:** That's right. 1000Le is worth less.
4. **Write** on the board ' $1000 < 10,000$ '. **Say:** One thousand has 4 place values. Ten thousand has 5 place values. One thousand has less place values than 10,000. The number with less place values is always less.
5. Explain that there are 5 steps to compare 2 numbers using place value. Read the steps from the board as you explain them:
 - a) Step 1: Compare the number of place values.
 - The number with more place values is bigger.
 - Move to the next step if the number of place values is the same.
 - b) Step 2: Compare the digits in the thousands place.
 - The number with the bigger digit in the thousands place is more.
 - Move to the next step if the digits are the same.
 - c) Step 3: Compare the digits in the hundreds place.

- The number with the bigger digit in the hundreds place is bigger.
 - Move to the next step if the digits are the same.
- d) Step 4: Compare the digits in the tens place.
- The number with the bigger digit in the tens place is bigger.
 - Move to the next step if the digits are the same.
- e) Step 5: Compare the digits in the ones place.
- The number with the bigger digit in the ones place is bigger.
 - Move to the next step if the digits are the same.
6. **Write** 2145 and 897 on the board. Read aloud and use Step 1. Write: $2145 > 897$
 7. **Write** 2145 and 2304 on the board. Read aloud and use Steps 1-2. Write: $2145 < 2304$
 8. **Write** 6350 and 6278 on the board. Read aloud and use Steps 1-3. Write: $6350 > 6278$
 9. **Write** 3549 and 3561 on the board. Read aloud and use Steps 1-4. Write: $3549 < 3561$
 10. **Write** 3549 and 3548 on the board. Read aloud and use Steps 1-5. Write: $3549 > 3548$

Guided Practice (10 minutes)

1. **Write** on the board: 'Use the correct symbol to compare the following numbers:'
 - a) $123 \underline{\quad} 765$
 - b) $8096 \underline{\quad} 7096$
 - c) $5478 \underline{\quad} 5378$
 - d) $6281 \underline{\quad} 6273$
 (Answer: a) $<$, b) $>$, c) $>$, d) $>$)
2. Tell pupils to work with a partner to use the steps to decide which number in each pair is bigger.
3. Tell pupils to talk about the first pair of numbers with their partner. Then complete $123 < 765$ together as a class. Tell pupils to write $123 < 765$ in their exercise books.
4. Repeat with each pair of numbers.




Independent Practice (10 minutes)

1. Write on the board: 'Use the correct symbol to compare the following numbers:'
 - a) $8096 \underline{\quad} 986$
 - b) $8096 \underline{\quad} 8964$
 - c) $8906 \underline{\quad} 8964$
 - d) $8964 \underline{\quad} 8963$
 (Answer: a) $>$, b) $<$, c) $<$; d) $>$)
2. Have pupils to exchange their notebooks and check their answers as you read them aloud.

Closing (3 minutes)

1. **Write** on the board: $8096 > 986$
2. **Ask:** How do we know 8096 is more than 986? Raise your hand to answer. (Answer: It has more place values.)
3. **Write** on the board: $8096 < 8964$ and $8964 > 8906$
4. **Ask:** How do we know 8096 is less than 8964? Raise your hand to answer. (Answer: The number in the hundreds place is smaller.)
5. **Ask:** How do we know 8964 is more than 8906? Raise your hand to answer. (Answer: The number in the tens place is bigger.)

Lesson Title: Reading and Writing Numbers in Numerals up to 10,000 Using Place Value	Theme: Knowing and Understanding Numbers up to 10,000	
Lesson Number: M-04-005	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to read and write numbers in numerals up to 10,000.		Teaching Aids Digit cards large enough for the class to see.		Preparation Make a set of digit cards. Gather 10 cards or pieces of paper. Write 1 digit on each card: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.
---	---	---	--	---	--

Opening (3 minutes)

- Write** on the board: 401, 402, 403
- Read aloud with the class '401, 402, 403'. **Ask:** Which digit changes? What are we counting by in this pattern? Raise your hand to answer. (Answer: ones)
- Write** on the board: 401, 411, 421
- Read aloud with the class '401, 411, 421'. **Ask:** Which digit changes? What are we counting by in this pattern? Raise your hand to answer. (Answer: tens)
- Write** on the board: 401, 501, 601
- Read aloud with the class '401, 501, 601'. **Ask:** What are we counting by in this pattern? Raise your hand to answer. (Answer: 100s) **Ask:** What number comes next after 601? (Answer: 701) **Ask:** What number comes before 401? (Answer: 301)
- Write** on the board: 4001, 5001, 6001
- Read aloud with the class '4001, 5001, 6001'. **Ask:** What are we counting by in this pattern? Raise your hand to answer. (Answer: 1000s) **Ask:** What number comes next after 6001? (Answer: 7001) **Ask:** What number comes before 4001? (Answer: 3001)

Introduction to the New Material (10 minutes)

- Say:** Today we will read and write numbers up to 10,000.
- Invite 4 pupils to come to the front of the class.
- Give each pupil 1 digit card. Ask the pupils to arrange themselves in a straight line and hold up their digit cards. For example, pupils hold up 2, 7, 9 and 3. The class reads: '2793'. (Answer: two thousand seven hundred ninety-three)
- Ask** the pupil in the first place and the pupil in the last place to switch positions in line. Read the new number with the class. For example, the pupil holding '2' and the pupil holding '3' switch places. Pupils hold up 3, 7, 9, 2. The class reads: '3792'. (Answer: three thousand seven hundred ninety-two)
- Collect the digit cards from the pupils and ask them to return to their seats.
- Say:** Now we will play the Secret Number Game. I will give clues. The class will tell me the answers and help me write the number. Write on the board '____ _'.
- Say:** The digit in the ones place is the number of legs on a dog. **Ask:** What number do I write in the ones place? Raise your hand to answer. (Answer: 4) Write on the board '____ _ 4'.
- Say:** The digit in the tens place is the number of hands you have. **Ask:** What number do I write in the tens place? Raise your hand to answer. (Answer: 2) Write on the board '____ 2 ____ 4'.

9. **Say:** The digit in the hundreds place is $6 + 2$. **Ask:** What number do I write in the hundreds place? Raise your hand to answer. (Answer: 8) Write on the board ' ____ 8 2 4'.
10. **Say:** The digit in the thousands place is $19 - 10$. **Ask:** What number do I write in the thousands place? Raise your hand to answer. (Answer: 9) Write on the board '9 8 2 4'. Ask the class to read the secret number aloud together.

Guided Practice (10 minutes)

1. **Write** on the board: 3, 6, 7, 1
2. Tell pupils they will work with a partner to use all 4 digits to make the smallest number possible. Discuss how to begin to make the smallest number. **Say:** You put the smallest number in the thousands place. The 1 is the smallest number. It goes in the thousands place.
3. Give pupils time to complete the activity with their partners. Allow quiet talking and discussion among pupils.
4. After a few minutes, ask pupils to read the number they made. Discuss why 1367 is the smallest number that can be made with the digits.




Independent Practice (10 minutes)

1. **Write** on the board:
 - a) 1, 3, 8, 6
 - b) 2, 9, 4, 5
2. Tell pupils to use each set of 4 digits to write the biggest and the smallest numbers possible in their exercise books.

Closing (3 minutes)

1. **Ask:** What is the biggest number that can be made with 1, 3, 8, 6? Raise your hand to answer. (Answer: 8631) Write '8631' on the board and read it aloud with the class. **Ask:** How do you know that is the biggest number? Raise your hand to answer. (Answer: It has the biggest number in the thousands. The next biggest number is in the hundreds place. The next biggest number is in the tens place. The smallest number is in the ones place.)
2. **Ask:** What is the biggest number that can be made with 2, 9, 4, 5? Raise your hand to answer. (Answer: 9542) Write '9542' on the board and read it aloud with the class. Repeat the above questions to discuss why 9542 is the biggest number that can be made with 2, 9, 4, 5.
3. **Say:** If you notice, the biggest number and smallest numbers are simply reversed. For example, 9542 is reversed to be 2459.
4. **Say:** Good job today, pupils! You learned how to read and write numbers up to 10,000.

Lesson Title: Ordering Whole Numbers up to 10,000	Theme: Rounding up to 10,000	
Lesson Number: M-04-006	Class/Level: Primary 4	Time: 35 minutes

	<p>Learning Outcomes By the end of the lesson, pupils will be able to:</p> <ol style="list-style-type: none"> 1. Order numbers from smallest to biggest. 2. Order numbers from biggest to smallest. 		<p>Teaching Aids Five steps to compare numbers using place value</p>		<p>Preparation Write the 5 steps to compare numbers using place value on the board.</p>
---	--	---	---	---	--

Opening (3 minutes)

1. **Write** on the board: __, __, 402, 403, 404, __, __
2. Read out loud with the class '402, 403, 404'. **Ask:** If we count in 1s, what comes next? Raise your hand to answer. (Answer: 405, 406) **Ask:** What number are we counting by? Raise your hand to answer. (Answer: 1s)
3. **Say:** To find out what number comes before 402, we count backward in 1s from 402. **Ask:** What number comes before 402? Raise your hand to answer. (Answer: 401) **Ask:** What number comes before 401? Raise your hand to answer. (Answer: 400)
4. **Write** on the board: __, __, 401, 501, 601, __, __
5. **Ask:** If we count in 100s what comes next? (Answer: 701) **Ask:** What number comes next after 701? Raise your hand to answer. (Answer: 801)
6. **Say:** To find out what number comes before 401, we count backward in 100s from 401. **Ask:** What number comes before 401 if we count backward in 100s? Raise your hand to answer. (Answer: 301) **Ask:** What number comes before 301 if we count backward in 100s? Raise your hand to answer. (Answer: 201)

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn to use place value to order numbers from smallest to biggest and from biggest to smallest. **Ask:** Which is worth more, 100Le or 1000Le? Raise your hand to answer. (Answer: 1000Le) **Say:** That's right. 1000Le is worth more. **Ask:** Which is worth more, 1000Le or 2000Le? Raise your hand to answer. (Answer: 2000Le)
2. **Write** on the board: 100, 1000, 2000
3. Read the numbers out loud with pupils. **Say:** I see 100 is the smallest number. It has the least number of place values. It has 3 place values. The other numbers have 4 place values. Three place values is less than 4 place values, so 100 is the smallest number.
4. **Ask:** How many place values do 1000 and 2000 have? Raise your hand to answer. (Answer: 4) How can we tell which is bigger? Raise your hand to answer. (Answer: Look at the thousands place. Two is more than 1, so 2000 is more than 1000.)
5. **Say:** Today we will use the 5 steps we learned last week to order numbers. Read the steps from the board. Review the steps with pupils. Read them out loud.
 - a) Step 1: Compare the number of place values.
 - The number with more place values is bigger.

- Move to the next step if the number of place values is the same.
- b) Step 2: Compare the digits in the thousands place.
 - The number with the bigger digit in the thousands place is more.
 - Move to the next step if the digits are the same.
 - c) Step 3: Compare the digits in the hundreds place.
 - The number with the bigger digit in the hundreds place is bigger.
 - Move to the next step if the digits are the same.
 - d) Step 4: Compare the digits in the tens place.
 - The number with the bigger digit in the tens place is bigger.
 - Move to the next step if the digits are the same.
 - e) Step 5: Compare the digits in the ones place.
 - The number with the bigger digit in the ones place is bigger.
 - Move to the next step if the digits are the same.
6. **Write** on the board: 4145, 145, 2145, 6145
 7. Read the numbers out loud with pupils. **Say:** I will order these numbers from smallest to biggest. I will start by comparing the first 2 numbers. **Ask:** Which is smaller 4145 or 145? Raise your hand to answer. (Answer: 145) **Ask:** Why? Raise your hand to answer. (Answer: It has less place values.)
 8. **Write** on the board: 145, 4145
 9. **Say:** Next I will compare 4145 to 2145. **Ask:** Which is smaller 4145 or 2145? Raise your hand to answer. (Answer: 2145) **Ask:** Why? Raise your hand to answer. (Answer: It has a smaller digit in the thousands place. Two is less than 4.) **Say:** I know 4145 is bigger than 2145 because it has a bigger digit in the thousands place.
 10. **Write** on the board: 145, 2145, 4145
 11. **Say:** Now I need to decide where 6145 goes. I see it has 4 place values. The 6 is in the thousands place. Six is bigger than 4 or 2, so 6145 is the biggest number.
 12. **Write** on the board: 145, 2145, 4145, 6145
 13. Read the numbers out loud with pupils.
 14. **Say:** Now I will write the numbers from biggest to smallest, I write the biggest number first. I write the next biggest number second, and so on. Write on the board: 6145, 4145, 2145, 145
 15. Read the numbers out loud with pupils.

Guided Practice (10 minutes)

1. **Write** on the board: 4145, 4125, 4165, 4105
2. Tell pupils they will be working in groups of 3 to write the numbers from smallest to biggest. Then, they will write them from biggest to smallest. (Answer: Smallest to Biggest: 4105, 4125, 4145, 4165, Biggest to Smallest: 4165, 4145, 4125, 4105)
3. Give pupils time to complete the activity with their partners. Allow quiet talking and discussion among pupils.
4. Lead a discussion about which place value the pupils used to order the numbers. (Answer: the tens place)

Independent Practice (10 minutes)

1. **Write** on the board:
 - a) 4245, 4325, 4165, 4085

b) 860, 1360, 360, 1860




(Answer: Smallest to biggest: a) 4085, 4165, 4245, 4325, b) 360, 860, 1360, 1860; Biggest to smallest: a) 4325, 4245, 4165, 4085, b) 1860, 1360, 860, 360)

2. Tell pupils they will write the numbers from smallest to biggest. Then, they will write them from biggest to smallest.
3. Have pupils to exchange their books and check each other's answers as you read them aloud.

Closing (2 minutes)

1. **Write** on the board: 4085, 4165, 4245, 4325
2. **Say:** These numbers are arranged in some order. **Ask:** What is the order? Raise your hand to answer. (Answer: smallest to biggest)
3. **Say:** Yes, we know they are ordered from smallest to biggest by using the 5 steps. We looked at the hundreds place to order them because they all have 4 in the thousands place.
4. **Say:** Good job today, pupils! You learned how to order numbers from smallest to largest and largest to smallest.

Lesson Title: Rounding Whole Numbers to the Nearest 10	Theme: Rounding up to 10,000	
Lesson Number: M-04-007	Class/Level: Primary 4	Time: 35 minutes

 Learning Outcomes By the end of the lesson, pupils will be able to round off numbers up to 10,000 to the nearest 10.	 Teaching Aids Number line	 Preparation Write on the board a number line from 20 to 30: 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30.
--	---	---

Opening (3 minutes)

1. Review counting by 10s from 10 to 200.
2. Circle the number 23 on the number line. **Ask:** Is 23 closer to 20 or 30? Raise your hand to answer. (Answer: 20)
3. Circle the number 24 on the number line. **Ask:** Is 24 closer to 20 or 30? Raise your hand to answer. (Answer: 20)
4. Circle the number 26 on the number line. **Ask:** Is 26 closer to 20 or 30? Raise your hand to answer. (Answer: 30)
5. Circle the number 29 on the number line. **Ask:** Is 29 closer to 20 or 30? Raise your hand to answer. (Answer: 30)
6. **Say:** Today we will learn how to round off numbers to the nearest 10.

Introduction to the New Material (10 minutes)

1. **Write** on the board: '123'. **Read** the number out loud with pupils.
2. **Say:** We see on the number line that 23 is close to 20, so 123 rounded off to the nearest 10 is 120.
3. **Write** on the board '123 \approx 120'.
4. **Say:** The curved equals sign is used to show 123 is rounded off to 120.
5. **Write** on the board '128'. Read the number out loud with pupils.
6. **Say:** We see on the number line that the number 28 is close to 30, so 128 rounded off to the nearest 10 is 130.
7. **Write** on the board '128 \approx 130'.
8. **Say:** The curved equals sign to show 128 is rounded off to 130.
9. **Write** on the board '1 3 7'. Circle the 3 and underline the 7.
10. **Say:** I am going to teach you a chant to help you remember how to round off to the nearest 10.
11. Teach pupils the chant and have them chant it with you twice:
 - a) Circle the digit in the tens place. Underline the digit in the ones place. Circle the digit in the tens place, when you round off to 10.
 - b) Look at the digit in the ones place. Look at the digit in the ones place. 5, 6, 7, 8, 9 in the ones place makes the tens place change.
 - c) Look at the digit in the ones place. Look at the digit in the ones place. 4, 3, 2, 1 in the ones place means the tens place stays the same.
 - d) Write a 0 in the ones place. Write a 0 in the ones place. Write a 0 in the ones place, when you round off to 10.

12. **Say:** In 137, I circled the 3 in the tens place. I underlined the 7 in the ones place. The 7 in the ones place means the circled 3 changes to a 4. I write a 0 in the ones place.
13. **Write** on the board: '1 3 7' \approx 140.
14. Use the steps outlined in the chant in step 12 to show how to round off the numbers 1145, 5678 and 571 to the nearest 10.

Guided Practice (10 minutes)

1. **Write** on the board: 4145, 173, 68, 9102
2. Tell pupils they will be working in groups of 3 to round off each number to the nearest 10. Review the chant 1 more time with pupils. Remind pupils to circle the digit in the tens place and underline the digit in the ones place. Remind pupils to write the \approx .
3. Give pupils time to complete the activity with their groups. Allow quiet talking and discussion among pupils.
4. Lead a discussion about which place values the pupils used to round off the numbers. Go over the answers: $4145 \approx 4150$, $173 \approx 170$, $68 \approx 70$, $9102 \approx 9100$.




Independent Practice (10 minutes)

1. **Write** on the board: 'Round off each number to the nearest 10:'
 - a) 245 (Answer: 250)
 - b) 9434 (Answer: 9430)
 - c) 4166 (Answer: 4170)
 - d) 73 (Answer: 70)
 - e) 4081 (Answer: 4080)
 - f) 37 (Answer: 40)
 - g) 542 (Answer: 540)
 - h) 6614 (Answer: 6610)
2. Tell pupils to copy each problem and solve them in their exercise books.
3. Have pupils to exchange their notebooks and check each others answers as you read them aloud.

Closing (2 minutes)

1. **Say:** What is the digit in the ones place for each of the numbers you rounded off to 10? Raise your hand to answer. (Answer: 0)
2. **Say:** Remember, when you round up to the nearest 10, the ones place will always be zero.
3. **Say:** Good job today, pupils! You learned how to round numbers to the nearest 10.

Lesson Title: Rounding Whole Numbers to the Nearest 100	Theme: Rounding up to 10,000	
Lesson Number: M-04-008	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to round off numbers up to 10,000 to the nearest 100.		Teaching Aids 1. Number line		Preparation Draw on the board a number line from 200 to 300: 200, 210, 220, 230, 240, 250, 260, 270, 280, 290, 300.
---	---	---	--	---	---

Opening (3 minutes)

1. Revise counting by 100s from 100 to 1000.
2. **Circle** 230 on the number line. **Ask:** Is 230 closer to 200 or 300? Raise your hand to answer. (Answer: 200)
3. **Circle** 240 on the number line. **Ask:** Is 240 closer to 200 or 300? Raise your hand to answer. (Answer: 200)
4. **Circle** 260 on the number line. **Ask:** Is 260 closer to 200 or 300? Raise your hand to answer. (Answer: 300)
5. **Circle** 290 on the number line. **Ask:** Is 290 closer to 200 or 300? Raise your hand to answer. (Answer: 300)

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn how to round off numbers to the nearest 100s place.
2. **Write** on the board '1230'. Read the number aloud with pupils. **Say:** We see on the number line that 230 is close to 200, so 1230 rounded off to the nearest 100 is 1200.
3. **Write** on the board '1230 \approx 1200'. **Say:** The curved equals sign is used to show 1230 is rounded off to 1200.
4. **Write** on the board '1280'. Read the number aloud with pupils. **Say:** We see on the number line that 280 is close to 300, so 1280 rounded off to the nearest 100 is 1300.
5. **Write** on the board: 1280 \approx 1300
6. **Say:** The curved equals sign to show 1280 is rounded off to 1300. Write on the board '1372'. Circle the number 3 and underline the number 7. **Say:** I am going to teach you a chant to help you remember how to round off to the nearest 100.
7. Teach pupils the chant and have them chant it with you twice.
 - a) Circle the digit in the hundreds place. Underline the digit in the tens place. Circle the digit in the hundreds place, when you round off to 100.
 - b) Look at the digit in the tens place. Look at the digit in the tens place. 5, 6, 7, 8, 9 in the tens place makes the hundreds place change.
 - c) Look at the digit in the tens place. Look at the digit in the tens place. 4, 3, 2, 1 in the 10s place means the hundreds place stays the same.
 - d) Write a 0 in the ones place. Write a 0 in the tens place. The number ends with two zeros when you round off to 100
8. **Say:** In 1372, I circled the 3 in the hundreds place. I underlined the 7 in the tens place. The 7 in the tens place means the circled 3 changes to a 4. I write a 0 in the ones place and the tens place.

9. **Write** on the board: $1372 \approx 1400$
10. Use steps outlined in the chant in step 7 to show how to round off 1145, 5678, and 571 to the nearest 100.

Guided Practice (10 minutes)

1. **Write** on the board: 4145, 173, 2361, 9109
2. Tell pupils they will work in groups of 3 to round off each number to the nearest 100. Revise the chant with pupils.
3. Remind pupils to circle the digit in the hundreds place and underline the digit in the tens place. Remind pupils that a number rounded off to the nearest 100 ends with two zeroes.
4. Give pupils time to complete the activity with their groups. Allow quiet talking and discussion among pupils.
5. Lead a discussion about which place values the pupils used to round off the numbers. Go over the answers: $4145 \approx 4100$, $173 \approx 200$, $2361 \approx 2400$, $9109 \approx 9100$.




Independent Practice (10 minutes)

1. **Write** on the board: 'Round the following numbers to the nearest 100:'
 - a) 245 (Answer: 200)
 - b) 9464 (Answer: 9500)
 - c) 4166 (Answer: 4200)
 - d) 137 (Answer: 100)
 - e) 4081 (Answer: 4100)
 - f) 173 (Answer: 200)
 - g) 562 (Answer: 600)
 - h) 6617 (Answer: 6600)
2. Tell pupils to copy each number in their exercise books.
3. Tell pupils to round off each number to the nearest 100.

Closing (2 minutes)

1. **Say:** What is the digit in the ones place for each of the numbers you rounded off to 100? Raise your hand to answer. (Answer: 0)
2. **Say:** What is the digit in the tens place for each of the numbers you rounded off to 100? Raise your hand to answer. (Answer: 0)
3. **Say:** Remember, when you round up to the nearest 100, the ones and tens place will always be zero.
4. **Say:** Good job today, pupils! You learned how to round numbers to the nearest 100.

Lesson Title: Factors of Numbers up to 10	Theme: Factors	
Lesson Number: M-04-010	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to find the factors of numbers up to 10.		Teaching Aids Factor matrix		Preparation Draw a factor matrix on the board with 2 columns.
---	--	---	---------------------------------------	---	---

Opening (3 minutes)

1. Review 1's multiplication facts 1 to 10 aloud with the class. **Say:** $1 \times 1 = 1$, $1 \times 2 = 2$, $1 \times 3 = 3$, $1 \times 4 = 4$, $1 \times 5 = 5$, $1 \times 6 = 6$, $1 \times 7 = 7$, $1 \times 8 = 8$, $1 \times 9 = 9$, $1 \times 10 = 10$
2. Review 2's multiplication facts 1 to 5 aloud with the class: $2 \times 1 = 2$, $2 \times 3 = 6$, $2 \times 4 = 8$, $2 \times 5 = 10$
3. Review 3's multiplication facts 1 to 3 aloud with the class: $3 \times 1 = 3$, $3 \times 2 = 6$, $3 \times 3 = 9$
4. Review 4's multiplication facts 1 to 2 aloud with the class: $4 \times 1 = 4$, $4 \times 2 = 8$
5. Review 5's multiplication facts 1 to 2 aloud with the class: $5 \times 1 = 5$, $5 \times 2 = 10$

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn to find all the factors of numbers to 10. Factors are the numbers we use when we multiply.
2. **Write** on the board the number 6. **Say:** I will write all the multiplication facts with an answer of 6.
3. Teach pupils to say and list these multiplication facts in order, beginning with 1 facts. Write on the board: 1×6 , 2×3 , 6×1 . Tell pupils that the 'factors' of 6 are all the different numbers used in the multiplication problems. The four different factors of 6 are 1, 2, 3 and 6. The number 6 has 4 factors.
4. Refer to the factor matrix on the board. Write the factors of 6 in it.

Number	Factors
1	
2	
3	
4	
5	
6	1, 2, 3, 6
7	
8	
9	
10	

5. **Write** on the board the number 4. **Ask:** What are all the multiplication factors with an answer of 4?
6. Teach pupils to say and list these multiplication factors in order, beginning with 1 times facts. **Write** the facts on the board as pupils say them: 1×4 , 2×2 , 4×1 . Tell pupils that the 'factors' of

4 are all the different numbers used in the multiplication problems. The three different factors of 4 are 1, 2 and 4. The number 4 has 3 factors.

Guided Practice (10 minutes)

1. Tell pupils to copy the factor matrix into their exercise books.
2. Tell pupils to write all the factors of 6 and 4 in the factor matrix. Remind pupils to list the factors in order.
3. Lead a discussion about all the multiplication facts with an answer of 8: 1×8 , 2×4 , 4×2 , 8×1
4. Tell pupils to record these in their exercise books. Tell pupils to record the factors of 8 in their factor matrix. (Answer: 1, 2, 4, 8)
5. Tell pupils to check their answers with a partner.

Independent Practice (10 minutes)




1. Tell pupils to complete the factor matrix for 1, 2, 3, 5, 7, 9 and 10.
2. Remind pupils to write the multiplication facts first, and then write the factors in order in the matrix.

Closing (2 minutes)

1. Complete the matrix on the board.
2. Discuss answers. **Ask:** Which numbers have the most factors? Raise your hand to answer. (Answers: 6, 8, 10)
3. **Ask:** Which numbers have 2 as a factor? Raise your hand to answer. (Answers: 2, 4, 6, 8, 10, the even numbers)

Number	Factors
1	1
2	1, 2
3	1, 3
4	1, 2, 4
5	1, 5
6	1, 2, 3, 6
7	1, 7
8	1, 2, 4, 8
9	1, 3, 9
10	1, 2, 5, 10

Lesson Title: Factors of Numbers up to 20	Theme: Factors	
Lesson Number: M-04-010	Class/Level: 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to find the factors of numbers up to 20.		Teaching Aids Factor matrix		Preparation Draw a factor matrix on the board with 2 columns.
---	--	---	---------------------------------------	---	---

Opening (3 minutes)

- Review 1's multiplication facts to 11 to 20 aloud with the class: $1 \times 11 = 11$, $1 \times 12 = 12$, $1 \times 13 = 13$,
 $1 \times 14 = 14$, $1 \times 15 = 15$, $1 \times 16 = 16$, $1 \times 17 = 17$, $1 \times 18 = 18$, $1 \times 19 = 19$, $1 \times 20 = 20$
- Review 2's multiplication facts with 6 to 10 aloud with the class: $2 \times 6 = 12$, $2 \times 7 = 14$, $2 \times 8 = 16$,
 $2 \times 9 = 18$, $2 \times 10 = 20$
- Review 3's multiplication facts with 4 to 6 aloud with the class: $3 \times 4 = 12$, $3 \times 5 = 15$, $3 \times 6 = 18$
- Review 4's multiplication facts with 3 to 5 aloud with the class: $4 \times 3 = 12$, $4 \times 4 = 16$, $4 \times 5 = 20$
- Review 5's multiplication facts with 3 to 4 aloud with the class: $5 \times 3 = 15$, $5 \times 4 = 20$

Introduction to the New Material (10 minutes)

- Say:** Yesterday, we found all the factors of numbers 1 to 10. Today we will learn to find all the factors of numbers to 11 to 20. Factors are the numbers we use when we multiply.
- Write** on the board the number 16. **Say:** I am going to write all the multiplication facts with an answer of 16.
- Teach pupils to say and list these multiplication facts in order, beginning with 1 facts. Write on the board 1×16 , 2×8 , 4×4 , 8×2 , 16×1 . Remind pupils that the 'factors' of 16 are all the different numbers used in the multiplication problems.
- Say:** Look at the multiplication problems with an answer of 16.
- Ask:** What is the first factor of 16? Raise your hand to answer. (Answer: 1)
- Ask:** What factor comes next? Raise your hand to answer. (Answer: 2)
- Ask:** What are the remaining factors? Raise your hand to answer. (Answer: 4, 8, 16)
- Refer to the factor matrix on the board. Write the factors of 16 in it, as pupils name the factors.

Number	Factors
11	
12	
13	
14	
15	
16	1, 2, 4, 8, 16
17	
18	
19	
20	

9. **Write** on the board the number 18. **Ask:** What are all the multiplication facts with an answer of 18?
10. Tell pupils to say and list these multiplication facts in order, beginning with 1s facts such as $1 \times 11 = 11$, $1 \times 12 = 12$, $1 \times 13 = 13$ and so on.
11. **Write** the facts on the board as pupils say them: 1×18 , 2×9 , 3×6 , 6×3 , 9×2 , 18×1
12. Tell pupils that the 'factors' of 18 are all the different numbers used in the multiplication problems.
13. **Ask:** How many factors does the number 18 have? (Answer: 6)

Guided Practice (10 minutes)

1. Tell pupils to copy the factor matrix into their exercise books.
2. Tell pupils to write all the factors of 16 and 18 in the factor matrix. Remind pupils to list the factors in order.
3. Lead a discussion about all the multiplication facts with an answer of 12: 1×12 , 2×6 , 3×4 , 4×3 , 6×2 , 12×1
4. Tell pupils to record these in their exercise books. Then, tell pupils to record the factors of 12 in their factor matrix. (Answer: 1, 2, 3, 4, 6, 12)
5. Tell pupils to check their answers with a partner.

Independent Practice (10 minutes)




1. Tell pupils to complete the factor matrix for 11, 13, 14, 15, 17, 19 and 20.
2. Remind pupils to write the multiplication facts first. Then, write the factors in order in the matrix.

Closing (2 minutes)

1. Complete the matrix on the board.
2. Discuss answers. **Ask:** Which numbers have the most factors? Raise your hand to answer. (Answer: 12, 18, 20)
3. **Ask:** Which numbers have 2 as a factor? Raise your hand to answer. (Answer: 12, 14, 16, 18, 20, the even numbers)
4. **Ask:** Which numbers have only 2 factors? Raise your hand to answer. (Answer: 11, 13, 17, 19)
5. **Ask:** What number is a factor of every other number? Raise your hand to answer. (Answer: 1)

Number	Factors
11	1, 11
12	1, 2, 3, 4, 6, 12
13	1, 13
14	1, 2, 7, 14
15	1, 3, 5, 15
16	1, 2, 4, 8, 16
17	1, 17
18	1, 2, 3, 6, 9, 18
19	1, 19
20	1, 2, 4, 5, 10, 20

Lesson Title: Common Factors of Numbers up to 10	Theme: Factors	
Lesson Number: M-04-011	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to find the common factors of numbers up to 10.		Teaching Aids Factor matrix		Preparation 1. Draw a factor matrix for 1 to 10 on the board. 2. Fill it in with all the factors.
---	---	---	---------------------------------------	---	--

Opening (3 minutes)

- Ask** pupils to find the factor matrix for 1 to 10 they made in their exercise books.
- Say:** Look your factor matrices.
- Ask:** What number is a factor of all the numbers? Raise your hand to answer. (Answer: 1)
- Review the meaning of even numbers. **Say:** Even numbers are the numbers we say when we count in 2s. We will count in 2s from 0 to 10 to find even numbers. Ready, begin: 0, 2, 4, 6, 8, 10. These are even numbers from 0 to 10.
- Say:** Look at the even numbers in your factor matrices. We know 1 is a factor of all numbers.
- Ask:** What other number is a factor of all even numbers? Raise your hand to answer. (Answer: 2)

Introduction to the New Material (10 minutes)

- Say:** Last week, we learned to find factors. Today we will learn to find common factors of numbers to 10. Common factors are the factors that 2 numbers have in common. They are the factors that are the same in a given set of numbers.
- Write** on the board: Common factors for 6 and 4
- Say:** I want to find the common factors of 6 and 4.
- Refer to the factor matrix on the board:

Number	Factors
1	1
2	1, 2
3	1, 3
4	1, 2, 4
5	1, 5
6	1, 2, 3, 6
7	1, 7
8	1, 2, 4, 8
9	1, 3, 9
10	1, 2, 5, 10

- Say:** The first factor of 4 is 1. The first factor of 6 is 1. So, 1 is a common factor of 4 and 6. The next factor of 4 is 2. The next factor of 6 is 2. So, 2 is a common factor of 4 and 6.
- Write** on the board: Common factors for 6 and 4 are 1 and 2.
- Ask:** Is 6 a factor of 4? Raise your hand to answer. (Answer: No)
- Say:** That's right. Six is not a factor of 4, so 6 is not a common factor of 4 and 6. Common factors are factors of both numbers.

Guided Practice (10 minutes)

1. **Write** on the board:
 - a) Find the common factors of:
 - 3 and 6 (Answer: 1, 3)
 - 2 and 4 (Answer: 1, 2)
 - 4 and 8 (Answer: 1, 2, 4)
2. Tell pupils to work in groups of 3 to find the common factors. Remind them to use the factor matrix in their exercise book or the factor matrix on the board.
3. Lead a discussion about what pupils notice about the common factors of 3 and 6.
4. **Ask:** Are all the factors of 3 also factors of 6? Raise your hand to answer. (Answer: Yes)
5. **Ask:** Are all the factors of 6 factors of 3? Raise your hand to answer. (Example answer: No, 6 is not a common factor.)
6. **Ask:** Why do you think 6 is not a common factor of 6 and 3? Raise your hand to answer. (Example answer: Because it is too big. You cannot multiply it by a whole number to get 3.)




Independent Practice (10 minutes)

1. **Write** on the board:
 - a) Find the common factors of:
 - 5 and 10
 - 6 and 8
 - 3 and 9
 - 4 and 10
2. Tell pupils to find the common factors of each pair of numbers and write them in their exercise books.

Closing (2 minutes)

1. Go over answers with pupils.
 - a) Find the common factors of:
 - 5 and 10 (Answers: 1, 5)
 - 6 and 8 (Answers: 1, 2)
 - 3 and 9 (Answers: 1, 3)
 - 4 and 10 (Answers: 1, 2)
2. Discuss answers. **Ask:** Why do you think 2 is a common factor of 6 and 8, and of 4 and 10? Raise your hand to answer. (Example answer: They are all even numbers.)
3. **Ask:** What do you think the common factors of 8 and 10 are? Raise your hand to answer. (Answers: 1, 2)
4. **Say:** Good job today, pupils! You found common factors for pairs of numbers up to 10.

Lesson Title: Common Factors of Numbers up to 20	Theme: Factors	
Lesson Number: M-04-012	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to find the common factors of numbers up to 20.		Teaching Aids Factor matrices		Preparation Draw 2 factor matrices on the board: 1 matrix for 1 to 10 and 1 matrix for 11 to 20. Fill them in with all the factors.
---	---	---	---	---	---

Opening (3 minutes)

1. Ask pupils to find the factor matrices they made in their exercise books for 1 to 10 and 11 to 20.
2. **Say:** Look your factor matrices.
3. **Ask:** What number is a factor of all the numbers? Raise your hand to answer. (Answer: 1)
4. Review the meaning of even numbers. **Say:** Even numbers are the numbers we say when we count in 2s. We will count in 2s from 10 to 20 to find even numbers. Ready, begin: 10, 12, 14, 16, 18, 20. These are even numbers from 10 to 20.
5. **Say:** Look at the even numbers in your factor matrices. We know 1 is a factor of all numbers.
6. **Ask:** What other number is a factor of all even numbers? Raise your hand to answer. (Answer: 2)

Introduction to the New Material (10 minutes)

1. **Say:** Yesterday, we learned to find common factors of numbers up to 10. Today, we will learn how to find common factors of number up to 20. Common factors are the factors that 2 numbers have in common. They are the factors that are the same.
2. **Write** on the board: Common factors for 16 and 8
3. **Say:** I want to find the common factors of 16 and 8.
4. Refer to the factor matrices on the board.

Number	Factors		Number	Factors
1	1		11	1, 11
2	1, 2		12	1, 2, 3, 4, 6, 12
3	1, 3		13	1, 13
4	1, 2, 4		14	1, 2, 7, 14
5	1, 5		15	1, 3, 5, 15
6	1, 2, 3, 6		16	1, 2, 4, 8, 16
7	1, 7		17	1, 17
8	1, 2, 4, 8		18	1, 2, 3, 6, 9, 18
9	1, 3, 9		19	1, 19
10	1, 2, 5, 10		20	1, 2, 4, 5, 10, 20

5. **Say:** The first factor of 16 is 1. The first factor of 8 is 1. So, 1 is a common factor of 16 and 8. The next factor of 16 is 2. The next factor of 8 is 2. So, 2 is a common factor of 16 and 8.
6. **Write:** Common factors for 16 and 8 are 1, 2, ____, ____
7. **Say:** Turn to a partner and quietly talk about what other 2 numbers are common factors of 16 and 8.
8. After a few minutes, invite a few pupils to share their answers. (Example answers: The other common factors are 4 and 8.) Encourage pupils to use the words 'common factor' in their answer.

Guided Practice (10 minutes)

1. **Write** on the board:
 - a) Find the common factors of:
 - 6 and 12
 - 9 and 18
 - 10 and 20
2. Tell pupils to work in groups of 3 to find the common factors. Remind them to use the factor matrices in their exercise books or the factor matrices on the board.
3. Go over answers:
 - a) Common factors of:
 - 6 and 12 (1, 2, 3, 6)
 - 10 and 20 (1, 2, 5, 10)
 - 9 and 18 (1, 3, 9)
4. Lead a discussion about what pupils notice about the common factors of 6 and 12.
5. **Ask:** Are all the factors of 6 also factors of 12? Raise your hand to answer. (Answer: Yes)
6. **Ask:** Are all the factors of 12 factors of 6? Raise your hand to answer. (Example answer: No, 4 and 12 are factors of 12, but not factors of 6).
7. **Ask:** Why do you think 4 is not a common factor of 6 and 12? Raise your hand to answer. (Answer: Because $4 \times 1 = 4$ and $4 \times 2 = 8$. There is no multiplication fact with 4 that equals 6.)




Independent Practice (10 minutes)

1. **Write** on the board:
 - a) Find the common factors of:
 - 15 and 20
 - 12 and 18
 - 13 and 19
 - 6 and 18
2. Tell pupils to find the common factors of each pair of numbers and write them in their exercise books.

Closing (2 minutes)

1. Go over answers with pupils.
 - a) Find the common factors of:
 - 15 and 20 (Answers: 1, 5)
 - 12 and 18 (Answers: 1, 2, 3, 6)
 - 13 and 19 (Answers: 1)
 - 6 and 18 (Answers: 1, 2, 3, 6)
2. **Say:** Good job today, pupils! You found common factors for pairs of numbers up to 20!

Lesson Title: Revision of Addition and Subtraction up to 1000	Theme: Everyday Arithmetic Addition and Subtraction up to 10,000	
Lesson Number: M-04-013	Class/Level: Primary 4	Time: 35 minutes

	<p>Learning Outcomes By the end of this lesson, pupils will be able to add and subtract within 1000.</p>		<p>Teaching Aids 1. Steps for addition 2. Steps for subtraction</p>		<p>Preparation 1. Write on the board the 5 steps for addition of numbers to 1000. 2. Write on the board the 6 steps for subtraction of numbers to 1000. (See the Introduction to the New Material for the steps.)</p>
---	---	---	--	---	--

Opening (3 minutes)

1. Review place value with pupils. **Write** on the board '222'. **Read** it aloud with pupils.
2. **Write** on the board ' $200 + 20 + 2 = 222$ '. Read it aloud with pupils.
3. **Write** on the board '531'.
4. **Ask:** How can we write this as an addition problem with 100s, 10s and 1s? Raise your hand to answer.
5. **Say:** Turn to a partner and talk about what addition problem we could write.
6. After a minute, invite a few pupils to share their ideas. **Write** on the board ' $500 + 30 + 1 = 531$ '.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will review adding and subtracting numbers to 1000. We will use place value to line up the numbers to add or subtract.
2. Review the 5 steps for addition of numbers to 1000:
 - a) **Step 1:** Write the problem with the bigger number on top. Line up the place values.
 - b) **Step 2:** Add the digits in the ones place.
 - c) **Step 3:** If needed, regroup the answer into 10s and 1s. Write the 1s under the ones place. Move any 10s to the tens place, and write them there.
 - d) **Step 4:** Add all the digits in the tens place. Write the 10s in the tens place. Move any 100s to the hundreds place, and write them there.
 - e) **Step 5:** Add all the digits in the hundreds place. Write their sum.
3. **Write** on the board:
$$\begin{array}{r} 238 \\ + 83 \end{array} \qquad \begin{array}{r} 238 \\ +83 \end{array}$$
4. **Ask:** Which problem is lined up correctly? Raise your hand to answer. (Answer: the first one)
5. **Ask:** Why? Raise your hand to answer. (Example answers: the digits in the tens place need to be lined up for both numbers. The digits in the ones place need to be lined up for both numbers.)

6. Solve the problem using the steps.

$$\begin{array}{r} 11 \\ 238 \\ + 83 \\ \hline 321 \end{array}$$

7. Review the 6 steps for subtraction of numbers to 1000:
- Step 1:** Write the problem with the bigger number on top.
 - Step 2:** Look to see if place values need regrouping.
 - Step 3:** Regroup by borrowing from the next highest place value (hundreds to tens, tens to ones) as necessary.
 - Step 4:** Subtract in the ones place. Write the difference.
 - Step 5:** Subtract in the tens place. Write the difference.
 - Step 6:** Subtract in the hundreds place. Write the difference.
8. Solve the problem using the steps.

$$\begin{array}{r} 113 \\ 238 \\ - 83 \\ \hline 155 \end{array}$$

Guided Practice (10 minutes)

- Tell the pupils this story: There are 142 crayons to begin the year. 54 get lost or broken. How many are left?
- Ask:** What subtraction problem can we use to solve this story problem? Raise your hand to answer. (Answer: $142 - 54$)
- Tell pupils to write the subtraction problem in their exercise book.
- Tell pupils to work with a partner to solve the problem.
- Ask:** What is the answer? Raise your hand to answer. (Answer: 88)
- Ask:** What digit did you need to regroup? (Answer: The 2 in 142 changed to 12. The 4 in 142 changed to a 3.)
- Tell the pupils this story: A market woman sells 35 carrots on Monday. She sells 27 carrots on Tuesday. How many carrots does she sell in all?
- Ask:** What addition problem can we use to solve this story problem? (Answer: $35 + 27$)
- Tell pupils to work with a partner to solve the problem. **Ask:** What is the answer? Raise your hand to answer. (Answer: 62)




Independent Practice (10 minutes)

- Write on the board: 'Solve the following addition and subtraction problems:'
 - $812 + 182 =$
 - $153 - 28 =$
 - $153 + 28 =$
 - $812 - 82 =$
- Tell pupils to write the problems in their exercise books with the big number on top and the little number on the bottom. Remind pupils to line up the digits by place value.

Closing (2 minutes)

1. Go over answers with pupils.
2. Write on the board:
 - a) $812 + 182 = 994$
 - b) $153 - 28 = 125$
 - c) $153 + 28 = 181$
 - d) $812 - 82 = 730$
3. Ask pupils to discuss with a partner which problem was easiest. Which was most difficult? Invite a few pupils to share their answers with the class.
4. Say: Good job pupils, today you added and subtracted numbers up to 1000!

Lesson Title: Addition to 10,000	Theme: Everyday Arithmetic Addition and Subtraction up to 10,000	
Lesson Number: M-04-014	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to add within 10,000.		Teaching Aids Steps for addition		Preparation Write on the board the 6 steps for addition of numbers to 10,000.
---	---	---	--	---	---

Opening (3 minutes)

1. Review place value with pupils. Write on the board '2222'. Read it aloud with pupils.
2. **Write** on the board ' $2000 + 200 + 20 + 2 = 2222$ '. Read it aloud with pupils.
3. **Write** on the board '5316'.
4. **Ask:** How can we write this as an addition problem with 1000s, 100s, 10s and 1s? Raise your hand to answer.
5. **Say:** Turn to a partner and talk about what addition problem we could write.
6. After a minute, choose a few pupils to share their ideas. **Write** on the board ' $5000 + 300 + 10 + 6 = 5316$ '.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn to add numbers to 10,000. We will use place value to line up the numbers to add.
2. Review the 6 steps for addition of numbers to 1000.
 - a) **Step 1:** Write the problem with the bigger number on top. Line up the place values.
 - b) **Step 2:** Add the digits in the ones place.
 - c) **Step 3:** If needed, regroup the answer into 10s and 1s. Write the 1s under the ones place. Move any 10s to the tens place, and write them there.
 - d) **Step 4:** Add all the digits in the tens place. Write the 10s in the tens place. Move any 100s to the hundreds place, and write them there.
 - e) **Step 5:** Add all the digits in the hundreds place. Write the 100s in the hundreds place. Move any 1000s to the thousands place.
 - f) **Step 6:** Add all the digits in the thousands place. Write their sum.
3. **Write** on the board:
$$\begin{array}{r} 2387 \quad 2387 \\ + 913 \quad + 913 \\ \hline \end{array}$$
4. **Ask:** Which problem is lined up correctly? Raise your hand to answer. (Answer: the second one)
5. **Ask:** Why? Raise your hand to answer. (Example answer: The digits in the thousands place need to be lined up for both numbers. The digits in the tens place need to be lined up for both numbers. The digits in the ones place need to be lined up for both numbers.)
6. Solve the problem using the steps.

$$\begin{array}{r} 111 \\ 2387 \\ + 913 \\ \hline 3300 \end{array}$$

7. Solve $5365 + 3289$ with the class. (Answer: 8654)

Guided Practice (10 minutes)

1. Tell the pupils this story: There are 2 big football matches. There are 897 people at the first match. There are 1245 people at the next match. How many people in total went to the matches?
2. **Ask:** What addition problem can we use to solve this story problem? Raise your hand to answer. (Example answers: $1245 + 897$ or $897 + 1245$)
3. Tell pupils to work with a partner to solve the problem. Remind pupils to write the big number on top and the little number on the bottom. Remind pupils to line up the numbers by place value
4. After the pupils have worked with their partners for a few minutes, ask them to help you write and solve the problem on the board.
5. **Ask:** What number goes on top? Raise your hand to answer. (Answer: 1245)
6. **Ask:** What number goes on the bottom? Raise your hand to answer. (Answer: 897)
7. **Ask:** Where does the 8 go? Raise your hand to answer. (Answer: under the 2 in the hundreds place)
8. Invite pupils to help solve each step of the problem and write the steps on the board as they say them aloud.
9. **Ask:** What is the answer? Raise your hand to answer. (Answer: 2142)




Independent Practice (10 minutes)

1. **Write** on the board: 'Solve the following addition problems:'
 - a) $812 + 82 =$
 - b) $4139 + 452 =$
 - c) $1732 + 125 =$
 - d) $6153 + 1280 =$
2. Tell pupils to write the problems in their exercise books with the big number on top and the little number on the bottom. Remind pupils to line up the digits by place value.

Closing (2 minutes)

1. **Write** on the board and review the answers with pupils.
 - a) $812 + 82 = 894$
 - b) $4139 + 452 = 4591$
 - c) $1732 + 125 = 1857$
 - d) $6153 + 1280 = 7433$
2. Tell pupils to discuss with a partner which problem was the easiest. **Ask:** Which was the most difficult? Raise your hand to answer.
3. Invite a few pupils to share their answers with the class.

Lesson Title: Subtraction up to 10,000	Theme: Everyday Arithmetic Addition and Subtraction up to 10,000	
Lesson Number: M-04-015	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to subtract within 10,000.		Teaching Aids Steps for subtraction		Preparation Write on the board the 7 steps for subtraction of numbers to 10,000.
---	--	---	---	---	--

Opening (3 minutes)

1. Draw 11 circles on the board.
2. **Ask:** How many circles are on the board?
3. Tell pupils to put their heads down or close their eyes.
4. Erase 3 circles.
5. **Say:** Count the circles again. Hold up your fingers to show how many circles I erased.
6. Repeat with other amounts of circles, as time allows.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn to subtract numbers to 10,000. We will use place value to line up the numbers to subtract.
2. Review the 7 steps for subtraction of numbers to 10,000.
 - a) **Step 1:** Write the problem with the bigger number on top.
 - b) **Step 2:** Look to see if place values need regrouping.
 - c) **Step 3:** Regroup by borrowing from the next highest place value (1000s to 100s, 100s to 10s, 10s to 1s) as necessary.
 - d) **Step 4:** Subtract in the ones place. Write the difference.
 - e) **Step 5:** Subtract in the tens place. Write the difference.
 - f) **Step 6:** Subtract in the hundreds place. Write the difference.
 - g) **Step 7:** Subtract in the thousands place. Write the difference.
3. **Write** and solve the problem using the steps

$$\begin{array}{r}
 8\ 13 \\
 \cancel{9}386 \\
 - 853 \\
 \hline
 8533
 \end{array}$$

4. **Ask:** Did I need to regroup for the ones place? Raise your hand to answer. (Answer: No.) Why not? Raise your hand to answer. (Answer: The 6 on top is bigger than the 3 on the bottom.)
5. **Ask:** Did I need to regroup for the tens place? Raise your hand to answer. (Answer: No.) Why not? Raise your hand to answer. (Answer: The 8 on top is bigger than the 5 on the bottom.)
6. **Ask:** Did I need to regroup for the hundreds place? Raise your hand to answer. (Answer: Yes.) Why? Raise your hand to answer. (Answer: The 3 on top is smaller than the 8 on the bottom.)
7. **Ask:** How did I regroup? Raise your hand to answer. (Answer: You borrowed from the thousands place. First you crossed out the 9 in 9000 and made it an 8. Then you crossed out the 3 in the

hundreds place and have it the 1 you borrowed from the thousands place. You changed the 3 in the hundreds place to 13.)

8. **Ask:** What did I do after I regrouped? Raise your hand to answer. (Answer: You subtracted, starting with the ones place.)

Guided Practice (10 minutes)

1. Tell the pupils this story: There are 9870 grains of rice in a bag. A rat gets into the bag and eats 154 grains of rice before he is chased away. How many grains of rice are left in the bag?
2. **Ask:** What subtraction problem can we use to solve this story problem? Raise your hand to answer. (Answer: $9870 - 154$)
3. Tell pupils to write the subtraction problem in their exercise books. Remind them to write the problem with the bigger number on top and the smaller number on the bottom. Remind them to line up the problem by place value.
4. **Ask:** What digits do you need to regroup? Raise your hand to answer. (Answer: The 0 in 9870 is smaller than the 4 in 154. We need to borrow from the tens place for it.)
5. Guide pupils to follow the steps to solve the problem. (Answer: $9870 - 154 = 9716$)
6. **Write** on the board '3497 - 2654'.
7. Tell pupils to work with a partner to solve it. (Answer: $3497 - 2654 = 843$)




Independent Practice (10 minutes)

1. **Write** on the board:
 - a) $812 - 802 =$ (Answer: 810)
 - b) $1628 - 628 =$ (Answer: 1000)
 - c) $8920 - 1830 =$ (Answer: 7090)
 - d) $1539 - 617 =$ (Answer: 922)
2. Tell pupils to write the problems in their exercise books with the big number on top and the little number on the bottom. Remind pupils to line up the digits by place value.
3. Tell pupils to solve the problems individually.

Closing (2 minutes)

1. Review answers with pupils.
2. Tell pupils to discuss with a partner which problem was easiest. **Ask:** Which was most difficult? Raise your hand to answer.
3. Choose a few pupils to share their answers with the class.
4. **Say:** Good job today, pupils! You learned how to subtract with numbers up to 10,000.

Lesson Title: Multiplication	Theme: Everyday Arithmetic Multiplication	
Lesson Number: M-04-016	Class/Level: Primary 4	Time: 35 minutes

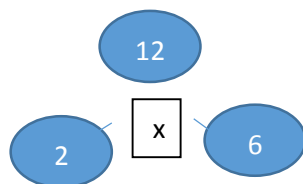
	Learning Outcomes By the end of the lesson, pupils will be able to read and write multiplication facts with 7 and 8.		Teaching Aids Equation circles drawn on the board		Preparation 1. Draw 3 circles on the board. 2. Write 6 and 7 multiplication facts without answers on the board.
---	--	---	---	---	--

Opening (3 minutes)

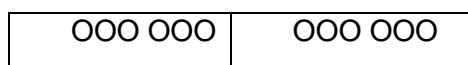
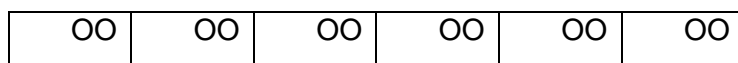
1. Have pupils count around the room by 3s. The first pupil says 3. The second says 6. The third pupil says 9, and so on. Once you get to 36, start again.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn our 7 and 8 multiplication facts. We will use what we know about other multiplication facts to help us.
2. Teach pupils that the order of factors in a multiplication problem does not change the answer. Show pupils the numbers in the circles below.



3. **Say:** What 2 multiplication facts can we write with these numbers? Raise your hand to answer. (Answer: $2 \times 6 = 12$, $6 \times 2 = 12$)
4. Draw pictures to prove that 2×6 and 6×2 both equal 12.



5. Show pupils how use what they know about multiplication facts 1, 2, 3, 4 and 5 to write and solve the related 6 multiplication facts.
6. **Write** on the board: $1 \times 6 = 6$, $6 \times 1 = ?$
7. **Say:** 1 times 6 equals 6, so what does 6×1 equal? Raise your hand to answer. (Answer: 6)
8. Repeat for $2 \times 6 = 12$, $3 \times 6 = 18$, $4 \times 6 = 24$, $5 \times 6 = 30$.
9. **Say:** $5 \times 6 = 30$, so 6×6 is 6 more. $6 \times 6 = 36$.
10. **Ask:** How can we find out what 6×7 is? Raise your hand to answer. (Answer: Add 6 more to 36)
11. **Ask:** 6 more than 36 is 42, so 6×7 is? Raise your hand to answer. (Answer: 42)
12. **Ask:** How can we find out what 6×8 is? Raise your hand to answer. (Answer: Add 6 more to 42)
13. **Ask:** 6 more than 42 is 48, so 6×8 is? Raise your hand to answer. (Answer: 48)
14. **Ask:** How can we find out what 6×9 is? Raise your hand to answer. (Answer: Add 6 more to 48)
15. **Ask:** 6 more than 48 is 54, so 6×9 is? Raise your hand to answer. (Answer: 54)

16. Repeat steps 5 to 15 for 7 times facts.

Guided Practice (10 minutes)

1. Chant 6 facts together as a class. Show pupils how to hold up a finger to show what number they are multiplying with 6. **Say:** $6 \times 1 = 6$ and hold up 1 finger.
2. Have pupils repeat $6 \times 1 = 6$ and hold up 1 finger. **Say:** $6 \times 2 = 12$ and hold up 2 fingers.
3. Have pupils repeat $6 \times 2 = 12$ and hold up 2 fingers. Continue for $6 \times 3 = 18$, $6 \times 4 = 24$, $6 \times 5 = 30$, $6 \times 6 = 36$, $6 \times 7 = 42$, $6 \times 8 = 48$, $6 \times 9 = 54$
4. Chant 7 facts together as a class. Show pupils how to hold up a finger to show what number they are multiplying with 6. **Say:** $7 \times 1 = 7$ and hold up 1 finger.
5. Have pupils repeat $7 \times 1 = 7$ and hold up 1 finger. **Say:** $7 \times 2 = 14$ and hold up 2 fingers.
6. Have pupils repeat $7 \times 2 = 14$ and hold up 2 fingers. Continue for $7 \times 3 = 21$, $7 \times 4 = 28$, $7 \times 5 = 35$, $7 \times 6 = 42$, $7 \times 7 = 49$, $7 \times 8 = 56$, $7 \times 9 = 63$
7. **Write** on the board:
 - a) 6×1 7×1
 - b) 6×2 7×2
 - c) 6×3 7×3
 - d) 6×4 7×4
 - e) 6×5 7×5
 - f) 6×6 7×6
 - g) 6×7 7×7
 - h) 6×8 7×8
 - i) 6×9 7×9
 - j) 6×10 7×10
8. Tell pupils to copy the multiplication facts into their exercise books.




Independent Practice (10 minutes)

1. Tell pupils to solve the multiplication facts for 8 and 5.
2. If pupils finish early, tell them to practice the facts by reading them silently to themselves to memorise their multiplication facts. You can also have them rewrite the facts in reverse. For example, $4 \times 6 = 24$, $5 \times 7 = 35$ and so on.

Closing (2 minutes)

1. Tell pupils to check their multiplication facts in groups of 3 and ensure everyone has the same answers.
2. Read the answers aloud for the pupils to check their answers. (Answer: $5 \times 1 = 5$, $5 \times 2 = 10$, $5 \times 3 = 15$, $5 \times 4 = 20$, $5 \times 5 = 25$, $5 \times 6 = 30$, $5 \times 7 = 35$, $5 \times 8 = 40$, $5 \times 9 = 45$, $5 \times 10 = 50$; $8 \times 1 = 8$, $8 \times 2 = 16$, $8 \times 3 = 24$, $8 \times 4 = 32$, $8 \times 5 = 40$, $8 \times 6 = 48$, $8 \times 7 = 56$, $8 \times 8 = 64$, $8 \times 9 = 72$, $8 \times 10 = 80$)

Lesson Title: Story Problems Using All Four Operations	Theme: Everyday Arithmetic	
Lesson Number: M-04-017	Class: Primary 4	Time: 35 minutes

 Learning Outcomes By the end of the lesson, pupils will be able to complete Multiplication table and 10 times table.	 Teaching Aids None	 Preparation None
--	--	--

Opening (3 minutes)

1. Review counting by 10s from 0 to 500 aloud as class in choral chant.
2. Review counting backward by 10s from 500 to 0 aloud as a class in choral chant.

Introduction to the New Material (10 minutes)

1. **Say:** Today will learn to multiply with 10.
2. **Write** on the board the following problems:
 - a) $10 \times 2 = 20$ $10 \times 30 = 300$ $10 \times 300 = 3000$
 - b) $10 \times 21 = 210$ $10 \times 32 = 320$ $10 \times 302 = 3020$
3. Tell pupils to share with a partner what they notice about the answer when we multiply by 10. After a few minutes, choose a few pupils to share their ideas. (Example answer: It's the same as the other number with a 0 after it.)
4. Chant 10 facts together as a class from 10 to 100. Show pupils how to hold up a finger to show what number they are multiplying with 10. **Say:** $10 \times 10 = 100$.
5. Have pupils repeat $10 \times 10 = 100$. **Say:** $10 \times 20 = 200$.
6. Have pupils repeat $10 \times 20 = 200$. Continue for $10 \times 30 = 300$, $10 \times 40 = 400$, $10 \times 50 = 500$, $10 \times 60 = 600$, $10 \times 70 = 700$, $10 \times 80 = 800$, $10 \times 90 = 900$, and $10 \times 100 = 1000$.

Guided Practice (10 minutes)

1. Use a game to have pupils practice multiplication with 6, 7 and 10.
2. Divide the class into Teams A and B.
3. Team A sits in a group on 1 side of the classroom. Team B sits on the other side.
4. Write a multiplication fact on the board. (Possible multiplication facts: $5 \times 7 = 35$, $3 \times 8 = 24$, $6 \times 8 = 48$, $4 \times 9 = 36$, $7 \times 7 = 49$, $2 \times 10 = 20$, $5 \times 9 = 45$, $8 \times 8 = 64$, $7 \times 3 = 21$, $4 \times 7 = 28$)
5. Tell each team to work together to come up with the answer.
6. Choose 1 pupil from each team to come up to the board and write the answer. Choose 1 girl and 1 boy.
7. Give 1 point to each team for each correct answer.

Independent Practice (10 minutes)

1. **Write** on the board: 'Complete the following ten times multiplication facts:
 - a) 10×1
 - b) 10×2
 - c) 10×3
 - d) 10×4




- e) 10×5
- f) 10×6
- g) 10×7
- h) 10×8
- i) 10×9
- j) 10×10
- k) 10×20
- l) 10×30
- m) 10×40
- n) 10×50
- o) 10×60
- p) 10×70
- q) 10×80
- r) 10×9

2. Tell pupils to copy the 10 multiplication facts into their exercise books and complete them
3. If pupils finish early, tell them to practice the facts by reading them silently to themselves.

Closing (2 minutes)

1. **Ask:** What pattern do you see when multiplying by 10? Raise your hand to answer. (Answer: The answer is just the number with an extra zero.)
2. **Ask:** What do you think will happen when you multiply a number by 100? Raise your hand to answer. (Example answers: the result will be the number with two extra zeroes; the result will be even bigger; you will add 2 zeroes)
3. Tell pupils to check their multiplication facts in groups of 3 and make sure everyone has the same answers.
4. **Say:** Good job today, pupils! You learned how to multiply by 10!

Lesson Title: Solve Story Problems Using All Four Operations	Theme: Everyday Arithmetic	
Lesson Number: M-04-018	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to solve simple 2 and 3-digit word problems using 4 operations.		Teaching Aids None		Preparation Write the story problems for the guided practice and independent practice on the board.
---	---	---	------------------------------	---	---

Opening (3 minutes)

- Say:** Fatima has 4 eggs. She buys 3 more eggs.
- Ask:** How many eggs does she have? Show me by holding up your fingers. (Answer: Pupils hold up 7 fingers.)
- Say:** Fatima has 7 eggs. She cooks 2 eggs.
- Ask:** How many eggs are left? Show me by holding up your fingers. (Answer: Pupils hold up 5 fingers.)
- Say:** Fatima buys 2 oranges on Monday, 2 oranges on Tuesday and 2 oranges on Wednesday.
- Ask:** How many oranges does she have? Show me by holding up your fingers. (Answer: Pupils hold up 6 fingers.)
- Say:** Fatima has 6 oranges. She gives the oranges to 3 friends. She gives each friend the same number of oranges.
- Ask:** How many oranges does each friend get? Show me by holding up your fingers. (Answer: Pupils hold up 2 fingers.)

Introduction to the New Material (10 minutes)

- Say:** Today we will learn to solve story problems using addition, subtraction, multiplication and division.
- Tell pupils this story: Mr. Bah has a shop. He sold 540 kg of rice in January. He sold 211 kg of rice in February. How much rice did he sell in all?
- Say:** To find the answer, we need to find out what 540 and 211 is in all. We need to add the numbers.
- Write** on the board ' $540 + 211 = 751$ '. **Say:** Mr. Bah sold 751 kg of rice in all.
- Tell pupils this story: Mr. Bah has 850 kg of sugar. He sells 500 kg of sugar. How much sugar does he have left?
- Say:** To find the answer, we need to find out what 850 take away 500 is. We need to subtract the numbers.
- Write** on the board ' $850 - 500 = 350$ '. **Say:** Mr. Bah has 350 kg of sugar left.
- Tell pupils this story: A primary school has 5 classes. Each class has 100 pupils. How many pupils are in the primary school?
- Say:** To find the answer, we need to find out what 5 times 100 is. We need to multiply the numbers.
- Write** on the board ' $5 \times 100 = 500$ '. **Ask:** How many pupils are in the primary school? Raise your hand to answer. (Answer: There are 500 pupils in the school.)

11. Tell pupils this story: A primary school has 400 pupils. There are 4 classes. Each class has the same number of pupils. How many pupils are in each class?
12. **Say:** To find the answer, we need to find out what 400 divided by 4 is. We need to divide the numbers. Raise your hand to answer (Answer: $400 \div 4 = 100$ in each class)

Guided Practice (10 minutes)

1. Put pupils in pairs.
2. **Write** the following on the board: 'Solve the following story problems involving all 4 operations. First write the problem and then solve the problem with your partner.'
 - a) Mr. Bah has a shop. He sold 65 kg of sugar in January. He sold 40 kg of sugar in February. How much sugar did he sell in all? (Answer: $65 \text{ kg} + 40 \text{ kg} = 105 \text{ kg}$)
 - b) Mr. Bah has 564 kg of rice. He sells 50 kg of rice. How much rice does he have left? (Answer: $564 \text{ kg} - 50 \text{ kg} = 514 \text{ kg}$)
 - c) A farmer plants 10 rows of maize. He puts 22 plants in each row. How many maize plants are there in total? (Answer: $10 \times 22 = 220$ plants in total)
 - d) There are 48 oranges. The oranges are packed into 6 crates. Each crate has the same number of oranges. How many oranges are in each crate? (Answer: $48 \div 6 = 8$ oranges in each crate)
3. Walk around and assist pupils and answer questions as necessary.
4. Invite pupils to come to the board to complete the problems while the other pupils check their work.




Independent Practice (10 minutes)

1. Tell pupils to solve each of the problems in their notebook individually.
2. **Write** the following on the board: 'Solve the following story problems involving all 4 operations. First write the problem and then solve the problem individually.'
 - a) A farmer has planted 440 plants in total. Each row has 11 plants. How many rows are there in total? (Answer: $440 \div 11 = 40$ rows of plants in total)
 - b) There are 12 oranges in each crate and there are 8 crates. How many total oranges are there? (Answer: $12 \times 8 = 96$ oranges total)
 - c) Maryam gets 10 eggs from the farm but needs to go back for another 12. How many eggs does she have in total? (Answer: $10 + 12 = 22$ eggs in total)
 - d) Mr. Gram has 20 new CDs to sell at his store. On the first day, he sells 13 CDs. How many CDs does he have left to sell? (Answer: $20 - 13 = 7$ CDs left)
3. If pupils finish early, tell them to practice their multiplication facts from the previous 2 days by reading them silently to themselves.

Closing (2 minutes)

1. **Ask:** What do you do first when you see a story problem? Raise your hand to answer. (Answer: Find out what operation you must use.)
2. **Ask:** What step do you need to do before you solve your problem? Raise your hand to answer. (Answer: You need to set up the problem using the operation and then solve.)
3. **Say:** Good job today, pupils! You learned how to solve simple word problems using all 4 operations!

Lesson Title: Inverse Operations	Theme: Everyday Arithmetic Addition and Subtraction	
Lesson Number: M-04-019	Class/Level: Primary 4	Time: 35 minutes

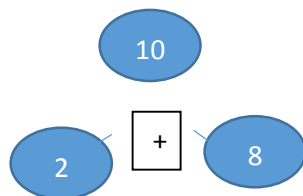
 Learning Outcomes By the end of the lesson, pupils will be able to carry out inverse operations using addition and subtraction.	 Teaching Aids Equation circles drawn on the board	 Preparation Draw 3 circles on the board.
---	---	--

Opening (3 minutes)

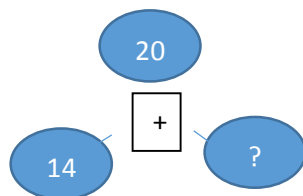
1. Review counting forward and backwards in 2s, 5s and 6s in choral chant up to 60.

Introduction to the New Material (10 minutes)

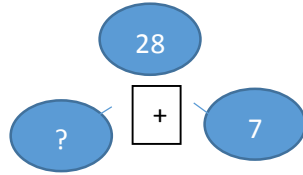
1. **Say:** Today we will learn how addition and subtraction are the opposite of each other.
2. **Draw** on the board:



3. **Say:** The circles show 3 numbers. We can make 2 addition problems and 2 subtraction problems with these numbers.
4. **Write** on the board: $2 + 8 = 10$ $8 + 2 = 10$
5. **Say:** The circles show 2 plus 8 equals 10 and 8 plus 2 equals 10.
6. **Write** on the board: $10 - 2 = 8$ $10 - 8 = 2$
7. **Say:** The circles also show 10 minus 2 equals 8 and 10 minus 8 equals 2.
8. **Draw** on the board:



9. **Say:** The circles only show 2 numbers. We need to find the missing number to make 2 addition problems and 2 subtraction problems with these.
10. **Write** on the board: $14 + ? = 20$ $? + 14 = 20$
11. **Say:** I need to find what I can add to 14 to make 20. I will count up. 14 + 1 is 15. 14 + 2 is 16. 14 + 3 is 17. 14 + 4 is 18. 14 + 5 is 19. 14 + 6 is 20. So, the missing number is 6.
12. **Write** on the board: $14 + 6 = 20$ $6 + 14 = 20$
13. **Say:** Now I can write the subtraction facts as well. **Write** on the board: $20 - 14 = 6$
14. **Ask:** What is the other subtraction fact? Turn to a partner and tell them what you think.
15. After a minute, invite a pupil to share the other subtraction fact. (Answer: $20 - 6 = 14$)
16. **Write** on the board: $28 - ? = 7$
17. **Say:** I can solve this problem using my circles. 28 minus something equals 7. **Write** on the board:



Guided Practice (10 minutes)

1. Tell pupils to copy the circles into their exercise books.
2. Tell pupils to work in groups of 3 to solve '28 – ? = 7' using the circles.
3. After a few minutes, invite a pupil to share their answer. (Answer: 28 – 21 = 7)
4. Tell pupils to work in groups of 3 to talk about what 2 addition problems they can write with the numbers 28, 21 and 7.
5. Allow a few minutes for pupils to talk. Then, tell them to write the addition problems in their exercise books.
6. After a few minutes, invite a pupil to share their addition problems. (Answer: 7 + 21 = 28, 21 + 7 = 28) Write on the board the addition problems.
7. Tell pupils to work in groups of 3 to talk about what 2 subtraction problems they can write with the numbers 28, 21 and 7.
8. Allow a few minutes for pupils to talk. Then, ask them to write the subtraction problems in their exercise books.
9. After a few minutes, invite a pupil to share their subtraction problems. (Answer: 28 – 21 = 7, 28 – 7 = 21) Write the subtraction problems on the board.

Independent Practice (10 minutes)




1. Tell pupils to copy and solve:
 - a) $? + 16 = 26$
 - b) $42 - ? = 36$
 - c) $56 + ? = 63$
 - d) $? - 10 = 30$
2. Remind pupils they may draw circles to help them solve the problems.

Closing (2 minutes)

1. Go over answers to the problems with pupils:

$$10 + 16 = 26 \quad 42 - 6 = 36 \quad 56 + 7 = 63 \quad 40 - 10 = 30$$
2. Invite a few pupils to share how they solved the problems using addition and subtraction.
3. **Say:** Good job pupils! Today you learned about inverse operations using addition and subtraction.

Lesson Title: Inverse Operations	Theme: Everyday Arithmetic Multiplication and Division	
Lesson Number: M-04-020	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to carry out inverse operations using multiplication and division.		Teaching Aids Equation circles drawn on the board		Preparation Draw 3 circles on the board.
---	--	---	---	---	--

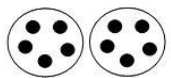
Opening (3 minutes)

1. **Ask** a pupil to say 2 different numbers between 2 and 10. **Write** them on the board.
2. Tell pupils to write the numbers in their exercise books. Tell them to add the numbers. Tell them to subtract the smaller number from the bigger number. Tell them to multiply the numbers.
3. **Ask:** Which answer is biggest? **Say:** Turn to a partner and say which answer is biggest.
4. After a few seconds, invite a pupil to share which answer is biggest. (Answer: The answer to the multiplication problem is biggest.)

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn how multiplication and division are the opposite of each other. All division facts have related multiplication facts, because division is the reverse or opposite of multiplication.

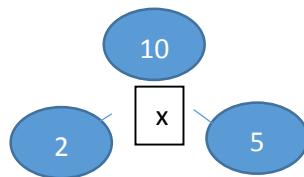
2. Draw on the board:



3. **Say:** There are 10 dots in all. They are divided into 2 groups. This shows the division fact $10 \div 2 =$

5. **Ask:** What multiplication facts does it show? Choose a pupil to say the multiplication fact. Raise your hand to answer. (Answers: $2 \times 5 = 10$, $5 \times 2 = 10$)

4. **Draw** on the board:



5. **Say:** The circles show numbers for the multiplication and division facts in a different way. We can make 2 multiplication problems and 2 division problems with these numbers.

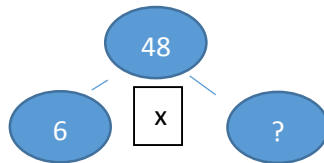
6. **Write** on the board: $2 \times 5 = 10$ $5 \times 2 = 10$

7. **Say:** The circles show 2 times 5 equals 10 and 5 times 2 equals 10.

8. **Write** on the board: $10 \div 2 = 5$ $10 \div 5 = 2$

9. **Say:** The circles also show 10 divided by 2 equals 5 and 10 divided by 5 equals 2.

10. **Draw** on the board:



11. **Say:** Now the circles only show 2 numbers. We need to find the missing number to make 2 multiplication problems and 2 division problems with these.
12. **Write** on the board: $6 \times ? = 48$ $? \times 6 = 48$
13. **Say:** I need to find what I can multiply by 6 to make 48. I know $6 \times 8 = 48$, so the missing number is 8.
14. **Write** on the board: $6 \times 8 = 48$ $8 \times 6 = 48$

Guided Practice (10 minutes)

1. Tell pupils to copy the circles into their exercise books.
2. Tell pupils to work in groups of 3 to solve ' $48 \div ? = 6$ ' using the circles and multiplication facts.
3. After a few minutes, invite a pupil to share their answer. (Answer: $48 \div 8 = 6$)
4. **Write** on the board: 28, 4 and 7
5. Tell pupils to work in groups of 3 to talk about what 2 multiplication problems they can write with the numbers.
6. Allow a few minutes for pupils to talk. Then, ask them to write the multiplication problems in their exercise books.
7. After a few minutes, invite a pupil to share their multiplication problems. (Answer: $7 \times 4 = 28$, $4 \times 7 = 28$) Write on the board the multiplication problems as the pupil answers.
8. Tell pupils to work in groups of 3 to talk about what 2 division problems they can write with the numbers 28, 4 and 7.
9. Allow a few minutes for pupils to talk. Then, ask them to write the division problems in their exercise books.
10. After a few minutes, invite a pupil to share their division problems. (Answer: $28 \div 4 = 7$, $28 \div 7 = 4$) Write the division problems on the board.




Independent Practice (10 minutes)

1. **Write** and **Say:** 'Solve following problems by finding the missing number. Then write 2 multiplication problems and 2 division problems for each set.'
 - a) $? \times 16 = 160$
 - b) $42 \div ? = 7$
 - c) $? \div 9 = 7$

Closing (2 minutes)

1. Go over answers to the problems with pupils:
 - a) $10 \times 16 = 160$, $16 \times 10 = 160$, $160 \div 16 = 10$, $160 \div 10 = 16$
 - b) $42 \div 6 = 7$, $42 \div 7 = 6$, $6 \times 7 = 42$, $7 \times 6 = 42$
 - c) $63 \div 9 = 7$, $63 \div 7 = 9$, $9 \times 7 = 63$, $7 \times 9 = 63$
2. **Say:** Now you can see that multiplication and division are opposites of each other and we can use this to find multiple types of problems for each trio of numbers.
3. **Say:** Good job today, pupils! You found inverse problems for multiplication and division.


Lesson Title: Measurements of Objects in Centimetres	Theme: Measurement and Estimation Length	
Lesson Number: M-04-021	Class: Primary 4	Time: 35 minutes

 <p>Learning Outcomes By the end of the lesson, pupils will be able to measure objects in cm using a ruler.</p>	 <p>Teaching Aids 1. 5-cm string for each group of 4 pupils 2. A 30-cm ruler, or 30-cm ruler drawn on board</p>	 <p>Preparation 1. Gather small, flat objects, such as small packets, squares of fabric, cards, small boxes or A4 paper. 2. Draw a 30-cm ruler on the board, if no ruler is available. (A piece of new chalk is about 10 cm long. To draw a 30-cm ruler, trace the length of the chalk. Mark the length with 10 even tick marks. Repeat 3 times for 30 cm.)</p>
---	---	---

Opening (3 minutes)

1. Ask pupils to think of objects that are longer than a pencil.
2. Have pupils raise their hands and call on 1 or 2 pupils to share.
3. Ask pupils to think of objects that are shorter than a chair.
4. Have pupils raise their hands and call on 1 or 2 pupils to share.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn how to measure in centimetres. A centimetre is about the width of your finger. 
2. Tell pupils to put their left pointer finger in the air and trace across the width with their right pointer finger.
3. Hold up a new piece of chalk. **Say:** This piece of chalk is about 10 cm long. I am going to measure it using a ruler.
4. Show pupils how to lay the end of the chalk at the end of the ruler to measure it.
5. **Say:** Now I am going to measure the chalk using a piece of string. The piece of string is 5 cm long. The chalk is 10 cm long. I need to lay the string on it twice to measure it.
6. Show pupils how to measure the chalk with the piece of string. Hold the string tight. Hold the chalk against the string. Mark the spot on the chalk where the string ends. Lay the string on it again.
7. **Say:** Now I am going to show you how to draw a line of a given length using a ruler.
8. Show pupils how to use a ruler to draw a line on the board. Read the length from the ruler.
9. **Say:** Now I am going to show you how to draw a line of a given length using a 5-cm piece of string.
10. Show pupils how to use the string to draw a 5-cm line on the board. Write the length.

Guided Practice (10 minutes)

1. Give each group of 4 pupils a 5-centimetre length of string. **Say:** This string is 5-cm long. Review how to measure with 5-cm string.
2. Tell pupils they will work together to draw a 5-cm line in their exercise books. If not enough string is available, pupils may use the width of their finger to draw the line. The width of a finger is about 1 cm.
3. Tell pupils to choose 2 members of their group to hold the string straight and tight against the paper.
4. Tell pupils to choose 1 member of the group to draw a line the same length as the string.
5. Tell pupils to choose 1 member of the group to write the length as 5 cm.
6. Have pupils repeat steps 3 to 5 until all 4 members of the group have had a turn at each role.
7. By the end of guided practice, each pupil should have a 5-cm line drawn in his or her exercise book.




Independent Practice (10 minutes)

1. Show pupils a small object. Measure the length using a ruler or the ruler drawn on the board.
2. Say the length.
3. Tell pupils to write the length of the object in their exercise books.
4. Remind pupils to write 'cm' after the number to show length.
5. Repeat with other small objects, as time allows.

Closing (2 minutes)

1. **Ask:** How many centimetres long is your pointer finger? Raise your hand to answer. (Example answer: The length of a pointer finger could be anywhere between 6 – 10 cm long depending on the pupil's hand size.)
2. Tell pupils to share their ideas with a partner.
3. Choose 1 or 2 pupils to share their ideas with the class.

Lesson Title: Measurement of Objects in Metres	Theme: Measurement and Estimation Length	
Lesson Number: M-04-022	Class/Level: Primary 4	Time: 35 minutes

	<p>Learning Outcomes By the end of the lesson, pupils will be able to measure objects in metres using string and rope.</p>		<p>Teaching Aids A metre stick, or 1 piece of string or rope 1 metre in length (A new piece of chalk is about 10 cm. A metre is the same as the length of 100 cm, or 10 new pieces of chalk.)</p>		<p>Preparation Make a 1-metre string or rope, if necessary.</p>
---	---	---	--	---	--

Opening (3 minutes)

1. Ask pupils to think of objects that are taller than them.
2. Have pupils raise their hands and call on 1 or 2 pupils to share.
3. Ask pupils to think of objects that are shorter than them.
4. Have pupils raise their hands and call on 1 or 2 pupils to share.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn how to measure in metres.
2. Show pupils the rope or string that is 1 metre long. **Say:** A metre is 100 centimetres. A metre is much longer than a centimetre. We use it to measure bigger things.
3. Teach pupils a simple chant to remember how many centimetres are in a metre. Say the chant while pupils listen. Then have pupils chant with you. Repeat 2 times. **Say:**
100 centimetres in a metre! 100 centimetres in a metre!
Centimetres are quite small.
100 centimetres in a metre! 100 centimetres in a metre!
Metres aren't small at all!
4. **Say:** I want to measure how tall the chalkboard is in metres.
5. Hold up a metre stick or a string 1 metre long.
6. Show pupils how to lay the metre stick or string along the side of the chalkboard. If you are using a string, choose a pupil to hold 1 end as you measure.
7. Write on the board how tall it is in metres.
8. Choose a pupil to come to the front of the class.
9. Ask pupils to tell you if the pupil is taller than a metre or shorter than a metre. Measure the pupil.
10. Measure the length of other objects in the room, such as a doorway, desk or table, as time allows.
11. Write the length of each object on the board and read it with pupils.

Guided Practice (10 minutes)

1. Tell pupils to work together in groups of 3 to name objects longer or taller than 1 metre.
2. Tell pupils they need to think of at least 5 objects taller than a metre with their group.
3. After pupils have had time to talk in their groups, ask a few pupils to share their ideas.

4. Write on the board 'Longer than a metre'.
5. Tell pupils to copy the title into their exercise books and write or draw the objects their groups thought of.




Independent Practice (10 minutes)

1. Measure the length of an object using the 1-metre string. Say the length.
2. Tell pupils to write the length of the object in their exercise books.
3. Remind pupils to write m after the number to show length.
4. Repeat with other objects, as time allows.

Closing (2 minutes)

1. Ask pupils to think about what objects to measure in centimetres and what objects to measure in metres.
2. Tell pupils to share an idea with a partner.
3. Choose 1 or 2 pupils to share their ideas with the class.
4. **Say:** Good job today, pupils! Yesterday you measured small objects using centimetres and today you measured larger objects using a metre stick. It is important to remember to use the right measurement depending on the size of the object.

Lesson Title: Measurement of Objects in Feet	Theme: Measurement and Estimation Length	
Lesson Number: M-04-023	Class/Level: Primary 4	Time: 35 minutes

	<p>Learning Outcomes By the end of this lesson, pupils will be able to measure objects using a foot ruler.</p>		<p>Teaching Aids 1-foot ruler, or draw a 1-foot ruler on the chalkboard (A new piece of chalk is about 4 inches and a foot is the same as the length of 12 inches, or about 3 new pieces of chalk.)</p>		<p>Preparation 1. Make a 1-foot ruler on the board, if necessary. 2. Gather objects that are about 1 or 2 feet long, such as ropes, sticks or newspapers.</p>
---	---	---	--	---	--

Opening (3 minutes)

1. Ask pupils to think of objects that are longer than their foot.
2. Have pupils raise their hands and call on 1 or 2 pupils to share.
3. Ask pupils to think of objects that are shorter than their foot.
4. Have pupils raise their hands and call on 1 or 2 pupils to share.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn how to measure in feet.
2. Show pupils the 1-foot ruler. **Say:** A foot is different than a metre or a centimetre. It is a different way of measuring or a different unit of measure. It is called a foot because it is about the same length as the foot of a grown man.
3. **Say:** I want to measure how long a few objects are in feet.
4. Hold up a 1-foot ruler or point to the ruler drawn on the board.
5. Hold up a stick. **Say:** Put your thumbs up if you think this is more than a foot long. (Answers will be different if the stick is long or short.)
6. Show pupils how to lay the stick along the ruler.
7. Write on the board how long it is in feet.
8. Choose a pupil to come to the front of the class.
9. Have the pupil hold up his or her arm.
10. Ask pupils to tell you if they think it is more than a foot or less than a foot from the pupil's elbow to the tip of their finger. Measure from the pupils elbow to fingertip using the 1-foot ruler, or have the pupil lay their arm next to the ruler drawn on the board.
11. Measure the length of other objects, such as a book, newspaper or string, as time allows.
12. Write the length of each object on the board in feet. Read it with pupils.

Guided Practice (10 minutes)

1. Tell pupils to work together in groups of 3 to name objects shorter than 1 foot.
2. Tell pupils they need to think of at least 5 objects shorter than 1 foot with their group.
3. After pupils have had time to talk in their groups, ask a few pupils to share their ideas.
4. Write on the board 'Shorter than a foot'.
5. Tell pupils to copy the title into their exercise books and write or draw the objects their groups thought of.




Independent Practice (10 minutes)

1. Measure the length of an object that is at least 2 feet long using the 1-foot ruler. Say the length.
2. Tell pupils to write the length of the object in their exercise books.
3. Remind pupils to write feet after the number to show length.
4. Repeat with other objects, as time allows.

Closing (2 minutes)

1. Tell pupil the length of their arm, from their elbow to their wrist, is the same length as their foot.
2. Ask them to think of a way to prove this is true without putting their foot on their arm.
3. Choose 1 or 2 pupils to share their ideas with the class. (Example answers: put their arm next to their foot; put their sandal next to their arm; draw a line next to their foot and put their arm next to the line)
4. **Say:** Good job today, pupils! You learned how to use a different unit of measure today called a foot and measured a number of objects using this measurement.

Lesson Title: Word Problems about Length of Small Objects (Centimetres)	Theme: Measurement and Estimation Length	
Lesson Number: M-04-024	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to solve word problems about short lengths of objects using centimetres.		Teaching Aids Matrix drawn on board		Preparation Draw a matrix with 2 rows on the board. <table border="1" style="margin-top: 10px;"> <tr><td style="width: 100px; height: 20px;"></td></tr> <tr><td style="width: 50px; height: 20px;"></td><td style="width: 50px; height: 20px;"></td></tr> </table>			

Opening (3 minutes)

- Review the chant about centimetres and metres by saying it aloud with the class. **Say:**
 100 centimetres in a metre! 100 centimetres in a metre!
 Centimetres are quite small.
 100 centimetres in a metre! 100 centimetres in a metre!
 Metres aren't small at all!

Introduction to the New Material (10 minutes)

- Say:** Today we will learn how to solve word problems about length in centimetres.
- Tell pupils this story: Two very small spiders were racing up a wall. The first spider crawled 20 centimetres up the wall. The second spider crawled 16 centimetres up the wall. How much farther did the first spider crawl?
- Show pupils the matrix. Write 20 and 16 in the matrix. Write a ? in the other box.

20	
16	?

- Say:** To solve this problem, we need to figure out how much more 20 is than 16.
- Write on the board $16 + ? = 20$. **Say:** I can count up from 16 to see how much more 20 is.
- Hold up a finger for each number as you count up from 16 to 20. **Say:** 17, 18, 19, 20. 20 is 4 more than 16.
- Write** on the board: $16 + 4 = 20$. The spider crawls 4 cm farther.
- Tell pupils this story: At the stationary store, a pencil is 16 centimetres long. A paintbrush is 4 centimetres longer than a pencil. How many centimetres long is the brush?
- Show pupils the matrix. Write 16 and 4 in the matrix. Write a ? in the other box.

?	
16	4

- Say:** To solve this problem, we need to find the answer to $16 + 4$.
- Write** on the board $16 + 4 = ?$. **Say:** I can count up from 16 to see what $16 + 4$ is.
- Hold up a finger for each number as you count up from 16 to 20. **Say:** 17, 18, 19, 20. $16 + 4$ is 20.
- Write** on the board $16 + 4 = 20$. The brush is 20 cm long.

Guided Practice (10 minutes)

1. Erase the numbers from the matrix.
2. Tell pupils to copy the blank matrix into their exercise books.
3. Tell them to draw 2 blank matrices.
4. Tell pupils this story: Foday's cell phone is 12 centimetres long. Favour's cell phone is 5 centimetres longer than Foday's. How long is Favour's cell phone?
5. **Ask:** What numbers go in the matrix? Raise your hand to answer. (Answer: 12 and 5) What kind of problem is this? Raise your hand to answer. (Answer: addition) How do you know to add? Raise your hand to answer. (Answer: Her phone is longer, so we need to add 12 + 5).
6. Guide pupils to put the numbers in the matrix.

?	
12	5

7. Guide pupils to write the addition problem and solve it. (Answer: $12 + 5 = 17$, Favour's phone is 17 cm long.)

Independent Practice (10 minutes)

1. Write the following word problems on the board :
 - a) Two turtles were seeing how far they could walk in 1 minute. The first turtle walked 24 centimetres. The second turtle walked 36 centimetres. How much farther did the second turtle walk? (Answer: $36 - 24 = 12$ centimetres farther.)
 - b) The width of one window is 28 centimetres and there are two windows side by side, what is the total width of the two windows? (Answer: $28 + 28 = 56$ centimetres)
2. Tell pupils to fill out the blank matrix in their exercise book with the numbers to solve the problem.
3. Tell pupils to solve the problem.

Closing (2 minutes)

1. Go over the answer to the problem from independent practice.

a)

36	
24	?

(Answer: $24 + 12 = 36$, The second turtle walked 12 cm farther.)




b)

?	
28	28

(Answer: $28 + 28 = 56$ centimetres total in width)

2. **Say:** Good job today, pupils! You solved story problems with centimetres.

Lesson Title: Word Problems About the Length of Small Objects (Centimetres)	Theme: Measurement and Estimation Length	
Lesson Number: M-04-025	Class/Level: Primary 4	Time: 35 minutes

 <p>Learning Outcomes By the end of this lesson, pupils will be able to solve word problems about long lengths of objects using metres and feet (not in the same problem).</p>	 <p>Teaching Aids Matrix drawn on board</p>	 <p>Preparation Draw a matrix with 2 rows on the board.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="2" style="height: 20px;"></td> </tr> <tr> <td style="width: 50px; height: 20px;"></td> <td style="width: 50px; height: 20px;"></td> </tr> </table>				

Opening (3 minutes)

- Review the chant about centimetres and metres by saying it aloud with the class. **Say:**
100 centimetres in a metre! 100 centimetres in a metre!
Centimetres are quite small.
100 centimetres in a metre! 100 centimetres in a metre!
Metres aren't small at all!
- Remind pupils that feet are a different unit of measure and that both feet and metres help measure medium length and longer objects.

Introduction to the New Material (10 minutes)

- Say:** Today we will learn how to solve word problems about length in metres and feet.
- Tell pupils this story: Marie and Joseph were seeing how far they could kick a ball. Mary kicked the ball 10 metres. Then Joseph kicked the ball 22 more metres. How far did the ball go in all?
- Show pupils the matrix. Write 20 and 22 in the matrix. Write a ? in the other box.

?	
22	20

- Say:** The problem asks how far the ball goes in all. I know when I hear 'in all' I need to add.
- Write** on the board $22 + 20 = 42$. **Say:** 22 plus 20 equals 42. The ball goes 42 metres in all.
- Tell pupils this story: Fatu sees a mango tree that is 135 feet tall. Ahmed sees a mango tree that is 115 feet tall. How much taller is the tree that Fatu sees?
- Show pupils the matrix. Write 135 and 115 in the matrix. Write a ? in the other box.

135	
115	?

- Say:** You will solve this problem with a partner during guided practice.

Guided Practice (10 minutes)

- Tell pupils to copy the matrix from the problem about the mango trees into their exercise books.
- Tell pupils to work with a partner to solve the problem, and write it in their exercise books.

3. After most pupils have solved the problem, choose 1 or 2 pupils to share how they solved it. (Example answers: There are 2 ways to solve the problem: $115 + 20 = 135$ or $135 - 115 = 20$. The tree Fatu sees is 20 metres taller.)
4. Write the following story problem on the board and have pupils copy and solve it using a matrix.
 - a) Ama lives 121 feet from the nearest corner store and Jean lives 157 feet from the same corner store. How much farther away does Jean live from the store? (Answer: $157 \text{ feet} - 121 \text{ feet} = 36 \text{ feet}$ farther away)

Independent Practice (10 minutes)

1. Tell pupils this story: The dog is running around. First he runs 45 metres down the road. Then, he runs 45 metres back up the road. How far does he run in all?
2. Tell pupils to draw a matrix and put the numbers in it.
3. Tell pupils solve the problem in their exercise books.
4. Tell pupils this story: My little brother is 3 feet tall. My father is 6 feet tall. How much taller is my father than my brother?

Closing (2 minutes)

1. Go over the answer to the problem from independent practice.

?	
45	45




(Answer: $45 + 45 = 90$. The dog runs 90 metres in all.)

6	
3	?

(Answer: $3 + 3 = 6$ or $6 - 3 = 3$. My father is 3 feet taller than my brother.)

2. **Say:** Good job today, pupils! You solved a number of word problems with feet and metres.

Lesson Title: Measuring the Perimeter of Objects Using Centimetres	Theme: Measurement and Estimation Perimeter	
Lesson Number: M-04-026	Class/Level: Primary 4	Time: 35 minutes

 <p>Learning Outcomes By the end of this lesson, pupils will be able to:</p> <ol style="list-style-type: none"> 1. Show what the perimeter of an object is. 2. Use a ruler to measure the perimeter of some class room objects in cm. 	 <p>Teaching Aids</p> <ol style="list-style-type: none"> 1. 5-cm string for each group of 4 pupils 2. 30-cm ruler, or 30 cm ruler drawn on board (A piece of new chalk is about 10 cm, long. To draw a 30cm ruler, trace the length of the chalk. Mark the length with 10 even tick marks. Repeat 3 times for 30 cm.) 	 <p>Preparation</p> <ol style="list-style-type: none"> 1. Gather small, flat rectangular or square objects, such as small packets, squares of fabric, cards, small boxes or A4 paper. 2. Draw a 30-cm ruler on the board, if no ruler is available.
---	---	---

Opening (3 minutes)

1. Tell pupils this story: A school compound wanted to build a fence. They need to figure out how much fencing to build.
2. Ask pupils to think silently for a few seconds about how people could know how much fencing to build.
3. Tell pupils to talk at their tables about some ideas about how people can measure to find out how much fencing is needed.
4. Choose 1 or 2 pupils to share ideas. (Example answers: They can measure around the field. They can walk the field and count. They can use a string or rope to measure.)

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn about perimeter and how to measure it in centimetres. Perimeter is when we add the length of all the sides of shape. Perimeter is like a fence. It is how long the sides are in all.
2. Ask pupils to trace around the outside of their exercise books with their pointer finger. **Say:** Put your finger on the top left corner of your exercise book and move your finger along the top side. Now move your finger down the right side of your exercise book. Now move your finger across the bottom side of your exercise book. Now move your finger up the left side of your exercise book. That is the perimeter.
3. Teach pupils the perimeter chant. First, chant it to the pupils while they listen. Next ask them to join in. Chant 3 times with pupils. **Say:**
The perimeter's around. The perimeter's around
Oh, oh, don't you know, the perimeter's around.
You add up all the sides. You add up all the sides
Oh, oh, don't you know, you add up all the sides.
4. Choose a small object. **Say:** I want to measure the perimeter of this. I need to measure each side. I need to write how long each side is. I need to add the sides.
5. Show pupils how to lay each side of the object next to the ruler to measure how long it is.
6. Measure the first side of the object. Write on the board its length in centimetres.

7. Measure the second side of the object. Write on the board its length in centimetres.
8. Measure the third side of the object. Write on the board its length in centimetres.
9. Measure the fourth side of the object. Write on the board its length in centimetres.
10. Add all the sides together to find the perimeter.

Guided Practice (10 minutes)

1. Give each group of 4 pupils a 5-centimetre length of string. **Say:** This string is 5-cm long. Revise how to measure with the 5-cm string.
2. Tell pupils they will work together to find the perimeter of their exercise books. If no string is available, pupils may measure using the width of their finger. The width of a finger is about 1 cm.



3. Remind pupils to measure each side of their exercise book.
4. Remind pupils to measure each side end to end.
5. Tell pupils that each person in their group should have a turn measuring a different side.
6. They should write the length of each side in their exercise books. Ask a few pupils to share the lengths of the sides they measured.
7. Guide pupils to add the length of the sides to find perimeter. (Example answers: Exercise books on A4 paper have sides of about 21 cm + 21 cm + 30 cm + 30 cm. $21 + 21 = 42$. $30 + 30 = 60$. $42 + 60 = 102$. The perimeter of an A4 exercise book is about 102 cm. Exercise books on A5 paper have sides of about 21 cm + 21 cm + 15 cm + 15 cm. $21 + 21 = 42$. $15 + 15 = 30$. $42 + 30 = 72$. The perimeter of an A5 exercise book is about 72 cm.)




Independent Practice (10 minutes)

1. Show pupils a small object. Measure each side using a ruler or the ruler drawn on the board.
2. Tell pupils to write the length of each side in their exercise books.
3. Tell pupils to add the lengths of the sides to find the perimeter of the object.
4. Repeat with other small objects, as time allows.

Closing (2 minutes)

1. Ask pupils to think again about how people can use measuring to find out how much fencing they need.
2. Tell pupils to share an idea with a partner.
3. Invite 1 or 2 pupils to share their ideas with the class.

Lesson Title: Measuring the Perimeter of Objects Using Centimetres and Metres	Theme: Measurement and Estimation Perimeter	
Lesson Number: M-04-027	Class/Level: Primary 4	Time: 35 minutes

 <p>Learning Outcomes By the end of the lesson, pupils will be able to:</p> <ol style="list-style-type: none"> 1. Show what the perimeter of an object is. 2. Measure the perimeter of large objects and spaces in metres and centimetres. 	 <p>Teaching Aids</p> <ol style="list-style-type: none"> 1. 5-cm string for each group of 4 pupils 2. A metre stick, or 1 piece of string or rope 1 metre in length (A new piece of chalk is about 10 cm. A metre is the same as the length of 100 cm, or 10 new pieces of chalk). 	 <p>Preparation Make a 1-metre string or rope, if necessary.</p>
--	--	--

Opening (3 minutes)

1. Review the perimeter song. With the class, sing or chant:
The perimeter's around. The perimeter's around
Oh, oh, don't you know, the perimeter's around.
You add up all the sides. You add up all the sides
Oh, oh, don't you know, you add up all the sides.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn about perimeter and how to measure it in metres and centimetres. Perimeter is when we add the length of all the sides of shape. Perimeter is like a fence around a field or school. It is how long the sides are in all.
2. **Say:** I want to measure the perimeter of the chalkboard.
3. Hold up a 5-cm piece of string. Hold up a metre stick or a string 1 metre long.
4. **Say:** Put a thumb up if you think the little piece of string is a good way to measure the perimeter. (Example answer: Some pupils may raise their thumbs.)
5. **Say:** Put a thumb up if you think the metre stick (or string) is a better way to measure the perimeter of the chalkboard. (Example answer: Most or all pupils should raise their thumbs.)
6. **Say:** It is better to use metres instead of centimetres to find the perimeter of large objects. It would take too much time to measure the chalkboard with just the little 5-cm string.
7. Show pupils how to lay the metre stick or string along each side of the chalkboard. If you are using a string, choose a pupil to hold one end as you measure.
8. Measure the first side of the chalkboard. Write on the board its length in metres.
9. Measure the second side of the object. Write on the board its length in metres.
10. Measure the third side of the object. Write on the board its length in metres.
11. Measure the fourth side of the object. Write on the board its length in metres.
12. Add all the sides. (Note to teacher: A chalkboard may be 1-metre tall and 1.5 metres [one metre and another half metre] across. If this is so, the perimeter is $1 + 1 + 1.5 + 1.5 = 5$.)

Guided Practice (10 minutes)

1. Give each group of 4 pupils a 5-centimetre length of string.
2. Tell pupils they will work together to find the perimeter of 2 exercise books put next to one another. If no string is available, pupils may measure using the width of their finger. The width of a finger is about 1 cm.
3. Remind pupils to put 2 exercise books right next to one another with no space between them.
4. Remind pupils to measure each side end to end.
5. Tell pupils that each person in their group should have a turn measuring a different side.
6. They should write the length of each side in their exercise books. Ask a few pupils to share the lengths of the sides they measured.
7. Guide pupils to add the length of the sides to find perimeter. (Example answers: Two exercise books on A4 paper have sides of about $42\text{ cm} + 42\text{ cm} + 30\text{ cm} + 30\text{ cm} = 144$. The perimeter of 2 A4 exercise books is about 144 cm. Two exercise books on A5 paper have sides of about $30\text{ cm} + 30\text{ cm} + 21\text{ cm} + 21\text{ cm} = 102$ cm. The perimeter of 2 A5 exercise books is about 102 cm.)




Independent Practice (10 minutes)

1. Tell pupils this story: A school compound wanted to build a fence. They need to figure out how much fencing to build. They measured their field and it has sides of 20 metres, 20 metres, 40 metres and 40 metres. What is the perimeter?
2. **Say:** Write in your exercise books the addition problem to find the perimeter.
3. Repeat the story if necessary.
4. Ask pupils to solve the problem.
5. Measure the perimeter of the teacher's desk or another similar large object.
6. Say the length of each side. **Say:** Write the length of each side as you measure it.
7. Tell pupils to add to find the perimeter.

Closing (2 minutes)

1. Tell pupils to think about how to explain perimeter to a younger child.
2. Tell pupils to share an idea with a partner.
3. Choose 1 or 2 pupils to share their ideas with the class.
4. **Say:** Good job today, pupils, today you measured the perimeter of small and large objects in centimetres and metres.

Lesson Title: Calculating Perimeter for Rectangles in Centimetres	Theme: Measurement and Estimation Perimeter	
Lesson Number: M-04-028	Class/Level: Primary 4	Time: 35 minutes

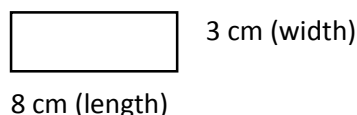
 <p>Learning Outcomes By the end of this lesson, pupils will be able to:</p> <ol style="list-style-type: none"> 1. Know a formula for perimeter of rectangles. 2. Calculate the perimeter of rectangles in cm using a formula. 	 <p>Teaching Aids Drawings of rectangles</p>	 <p>Preparation Draw 2 rectangles on the board. Write the length of 1 side and the width of 1 side for each.</p>
--	--	--

Opening (3 minutes)

1. Review the perimeter song. With the class, sing or chant:
The perimeter's around. The perimeter's around
Oh, oh, don't you know, the perimeter's around.
You add up all the sides. You add up all the sides
Oh, oh, don't you know, you add up all the sides.

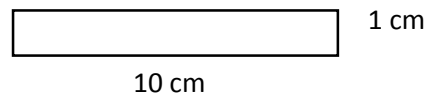
Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn the formula for finding the perimeter of a rectangle. The perimeter of a rectangle is how long the sides are in all when you add them together.
2. **Say:** First let's revise some important things about rectangles. Opposite sides are equal.
3. Draw on the board a rectangle. Write the length of 1 side. Write the width of 1 side.



4. **Say:** This rectangle has 2 sides with a length of 8 centimetres. It has a width of 3 centimetres.
5. **Ask:** How long is the top side? Show me with your fingers how many centimetres the top side is. (Answer: Pupils should hold up 8 fingers; pupils can answer using the length written on the long side of the rectangle on the board)
6. **Ask:** What is the width of the left side? Show me with your fingers how many centimetres the left width is. (Answer: Pupils should hold up 3 fingers; pupils can answer using the width written on the short side of the rectangle on the board)
7. **Write** on the board. $8 + 8 + 3 + 3 = 22$
8. **Say:** We can find the perimeter of a rectangle by adding length + length + width + width. The length is 8 centimetres so we add $8 + 8$. The width is 3 centimetres so we add $8 + 8 + 3 + 3$. The perimeter is 22 centimetres.

9. Draw on the board a rectangle. Write the length of 1 side. Write the width of 1 side.



10. **Say:** The length of this rectangle is 10 cm. The width is 1 cm. I can find the perimeter by adding $10 + 10 + 1 + 1 = 22$. The perimeter is 22 cm.
11. **Say:** I am going to teach you a new chant for the formula for the perimeter of a rectangle.
12. To teach the chant, first say it to the class. Then have the class chant it with you 2 or 3 times. **Say:**
A rectangle has length. A rectangle has width.
Add length plus length plus width plus width
To find perimeter.

Guided Practice (10 minutes)

1. Tell pupils this story: Yussuf ran around the perimeter of a field. The field had a width of 20 metres and a length of 40 metres. How far did Yussuf run?
2. Tell pupils to work with a partner to find the perimeter of the field. Tell them to use the formula length + length + width + width.
3. After a few minutes, invite a pupil to share their answer. (Answer: $40 + 40 + 20 + 20 = 120$. The perimeter is 120 metres.)
4. **Write** on the board: 'Find the perimeter for these rectangles.'
 - a) Length: 10 cm, Width: 2 cm (Answer: $10 + 10 + 2 + 2 = 24$ cm)
 - b) Length: 8 cm, Width: 6 cm (Answer: $8 + 8 + 6 + 6 = 28$ cm)
 - c) Length: 9 cm, Width: 3 cm (Answer: $9 + 9 + 3 + 3 = 24$ cm)
5. Tell pupils to work with a partner to solve each problem.
6. Tell pupils they may quietly talk and decide with their partner how to solve each problem. Then, each pupil writes and solves the problem in his or her own exercise book using the perimeter formula.
7. After a few minutes, choose 5 pupils to tell problems they wrote to find perimeter and the answers.




Independent Practice (10 minutes)

1. Tell pupils to solve in their exercise books: 'Find the perimeter for these rectangles.'
 - a) Length: 5, Width: 6
 - b) Length: 20, Width: 10
 - c) Length: 40, Width: 60
2. Challenge problem: A rectangle has a perimeter of 16 cm. The length is 10. What is the width?
Hint: $10 + 10 + ? + ? = 16$

Closing (2 minutes)

1. Go over answers to the problems with pupils. (Answers: $5 + 5 + 6 + 6 = 22$, The perimeter is 22 cm. $20 + 20 + 10 + 10 = 60$, The perimeter is 60 cm. $40 + 40 + 60 + 60 = 200$, The perimeter is 200 cm. $10 + 10 + 3 + 3 = 16$. The width is 3 cm.)
2. **Say:** Good job today, pupils! You solved perimeter problems using the formula.


Lesson Title: Calculating Perimeter for Squares in Centimetres	Theme: Measurement and Estimation Perimeter	
Lesson Number: M-04-029	Class/Level: Primary 4	Time: 35 minutes

 <p>Learning Outcomes By the end of this lesson, pupils will be able to:</p> <ol style="list-style-type: none"> 1. Know a formula for perimeter of squares. 2. Calculate the perimeter of squares in cm using a formula. 	 <p>Teaching Aids Drawings of squares</p>	 <p>Preparation Draw 2 squares on the board. Write the length of 1 side for each.</p>
--	---	---

Opening (3 minutes)

1. Review the perimeter song. With the class, sing or chant:
The perimeter's around. The perimeter's around
Oh, oh, don't you know, the perimeter's around.
You add up all the sides. You add up all the sides
Oh, oh, don't you know, you add up all the sides.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn the formula for finding the perimeter of a square. The perimeter of a square is how long the sides are in all.
2. **Say:** First let's review some important things about squares. The sides are all equal.
3. Draw on the board a square. Write the length of 1 side.  6 cm
4. **Say:** This square has 1 side with a length of 6 centimetres.
5. **Ask:** How long is the top side? Show me with your fingers how many centimetres the top side is. (Answer: Pupils should hold up 6 fingers; pupils can also read the measurement off the board: 6cm)
6. **Ask:** How long is the bottom side? Show me with your fingers how many centimetres the bottom side is. (Answer: Pupils should hold up 6 fingers; pupils can also read the measurement off the board: 6cm)
7. **Ask:** How long is the left side? Show me with your fingers how many centimetres the left side is. (Answer: Pupils should hold up 6 fingers; pupils can also read the measurement off the board: 6cm)
8. Write on the board. $6 + 6 + 6 + 6 = 24$. **Say:** We can find the perimeter of a square by adding up all the sides. The perimeter of this square is 24, because $6 + 6 + 6 + 6 = 24$.
9. Write on the board $6 \times 4 = 24$. **Say:** There is a faster way to find the perimeter of a square. We can multiply instead of adding. The sides are all the same length. There are 4 sides, so we can multiply the length of 1 side by 4 to get the perimeter.

10. Draw a square on the board. Write the length of 1 side.



5 cm

11. **Say:** The length of 1 side of this square is 5. There are 4 sides. I can find the perimeter by multiplying $5 \times 4 = 20$. The perimeter is 20 cm.
12. **Say:** I am going to teach you a new chant for the formula for the perimeter of a square.
13. To teach the chant, first say it to the class. Then have the class chant it with you 2 or 3 times. **Say:**
A square has equal sides. A square has equal sides.
Find the length of any side. Then multiply by 4.
Length times 4 is how. Length times 4 is how.
Length times 4 is how you find the perimeter of a square.

Guided Practice (10 minutes)

1. Tell pupils this story: Fatima planted a small garden of vegetables. She wants to make a fence around it. One side of the garden is 3 metres long. What is the perimeter of her garden?
2. Tell pupils to work with a partner to find the perimeter of the garden. Tell them to use the formula $\text{Length} \times 4$.
3. After a minute, choose a pupil to tell the answer. (Answer: $3 \times 4 = 12$. The perimeter is 12 metres.)
4. Write on the board: 'Find the perimeter for squares with sides that are:'
 - a) 10 cm (Answer: $10 + 10 + 10 + 10 = 40$ cm; $10 \times 4 = 40$ cm)
 - b) 8 cm (Answer: $8 + 8 + 8 + 8 = 32$ cm; $8 \times 4 = 32$ cm)
 - c) 9 cm (Answer: $9 + 9 + 9 + 9 = 36$ cm; $9 \times 4 = 36$ cm)
 - d) 12 cm (Answer: $12 + 12 + 12 + 12 = 48$ cm; $12 \times 4 = 48$ cm)
 - e) 1 cm (Answer: $1 + 1 + 1 + 1 = 4$ cm; $1 \times 4 = 4$ cm)
5. Tell pupils to work with a partner to solve each problem.
6. Tell pupils they may quietly talk and decide with their partner how to solve each problem. Then, each pupil writes and solves the problem in his or her own exercise book using the perimeter formula.
7. After a few minutes, choose 5 pupils to tell problems they wrote to find perimeter and the answers.




Independent Practice (10 minutes)

1. Tell pupils to solve in their exercise books:
 - a) Find the perimeter for square with sides that are: 20 cm, 2 cm, 7 cm, 70 cm, 50 cm.
 - b) A square has a perimeter of 16 cm. What is the length of each side? Hint: $? \times 4 = 16$

Closing (2 minutes)

1. Go over answers to the problems with pupils. (Answers: $20 \times 4 = 80$, The perimeter is 80 cm. $2 \times 4 = 8$, The perimeter is 8 cm. $7 \times 4 = 28$, The perimeter is 28 cm. $70 \times 4 = 280$, The perimeter is 280 cm. $4 \times 4 = 16$, The length of 1 side is 4 cm.)
2. Say: Good job today, pupils! You used the formula to find the perimeter of a square!

Lesson Title: Calculating Perimeter for Triangles in Centimetres	Theme: Measurement and Estimation Perimeter
Lesson Number: M-04-030	Class/Level: Primary 4 Time: 35 minutes

 <p>Learning Outcomes By the end of this lesson, pupils will be able to:</p> <ol style="list-style-type: none"> 1. Know a formula for perimeter of triangles. 2. Calculate the perimeter of triangles in cm using a formula. 	 <p>Teaching Aids Triangle drawings</p>	 <p>Preparation Draw 3 triangles on the board. Write the length of the sides.</p>
--	---	---

Opening (3 minutes)

1. Review the perimeter song. With the class, sing or chant:
The perimeter's around. The perimeter's around
Oh, oh, don't you know, the perimeter's around.
You add up all the sides. You add up all the sides
Oh, oh, don't you know, you add up all the sides.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn the formula for finding the perimeter of a triangle. The perimeter of a triangle is how long the sides are in all when you add all three together.
2. **Say:** First let's review some important things about triangles. Triangles have 3 sides. Sometimes the 3 sides are all the same length. Sometimes 2 sides are the same length. Sometimes all 3 sides are different lengths.
3. Draw 3 triangles on the board.
 - a) Draw 1 triangle with equal sides. Write '3 cm' next to each side.
 - b) Draw 1 triangle with 2 equal sides. Write '4 cm' next to each equal side. Write '7 cm' under the bottom (unequal) side.
 - c) Draw 1 triangle with 3 different sides. Write '5 cm' next to 1 side. Write '4 cm' next to a shorter side. Write '6 cm' next to the shortest side.
4. **Say:** The first triangle has 3 sides. Each side is 5 centimetres. I add $5 + 5 + 5 = 15$. The perimeter is 15 centimetres.
5. **Say:** The second triangle has 3 sides. Two sides are 5 centimetres. One side is 6 centimetres. I add $4 + 4 + 7 = 15$. The perimeter is 15 centimetres.
6. **Say:** The third triangle has 3 sides. The sides are 5 centimetres, 6 centimetres and 4 centimetres. I add $4 + 5 + 6 = 15$. The perimeter is 15 centimetres.
7. **Ask:** Are all the triangles the same? Raise your hand to answer. (Answer: No.)
8. **Ask:** Are all the perimeters the same? Raise your hand to answer. (Answer: Yes.)
9. Tell pupils to talk with a partner about how the perimeters of all 3 triangles are the same, when the triangles are different. After a few minutes, invite 2 or 3 pupils to share their ideas. (Example answer: All the triangles have sides that add up to 15.)

Guided Practice (10 minutes)

1. **Write** on the board: 'Find the perimeter for these triangles:'
 - a) Triangle A: All sides are 7 cm. (Answer: $7 + 7 + 7 = 21$ cm)
 - b) Triangle B: Two sides are 10 cm. One side is 15 cm. (Answer: $10 + 10 + 15 = 35$ cm)
 - c) Triangle C: One side is 6 cm. One side is 8 cm. One side is 9 cm. (Answer: $6 + 8 + 9 = 23$ cm)
2. Tell pupils to work with a partner to solve each problem.
3. Tell pupils they may quietly talk and decide with their partner how to solve each problem. Then, each pupil writes and solves the problem in his or her own exercise book using the perimeter formula.
4. After a few minutes, invite 5 pupils to tell the addition problems they wrote to find perimeter and the answers.




Independent Practice (10 minutes)

1. Tell pupils to solve in their exercise books: "Find the perimeter for these triangles:"
 - a) Triangle A: All sides are 9 cm.
 - b) Triangle B: Two sides are 8 cm. One side is 11 cm.
 - c) Triangle C: One side is 10 cm. One side is 8 cm. One side is 9 cm.
2. Challenge problem: A triangle has a perimeter of 30. How long could the sides be? Hint: There is more than 1 answer. (Example answers: 10 cm, 10cm, 10cm; 10 cm, 12, 8cm; 14 cm, 10cm, 6cm)

Closing (2 minutes)

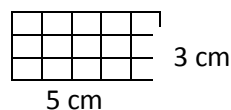
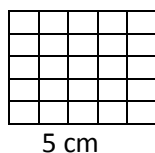
1. Go over answers to the problems with pupils. (Answers: $9 + 9 + 9 = 27$, The perimeter is 27 cm. $8 + 8 + 11 = 27$, The perimeter is 27 cm. $10 + 8 + 9 = 27$, The perimeter is 27 cm. Example answers for a triangle with a perimeter with 30: $10 + 10 + 10 = 30$, $8 + 8 + 14 = 30$, $10 + 11 + 9 = 30$, etc.)
2. **Say:** Good job today, pupils! You used the formula to find the perimeter of a number of triangles!

Lesson Title: Calculate Area of Objects by Counting Squares	Theme: Measurement and Estimation Area	
Lesson Number: M-04-031	Class/Level: Primary 4	Time: 35 minutes

 <p>Learning Outcomes By the end of the lesson, pupils will be able to:</p> <ol style="list-style-type: none"> Show what the area of an object is and Calculate area of objects by counting squares. 	 <p>Teaching Aids Drawings of squares and rectangles</p>	 <p>Preparation</p> <ol style="list-style-type: none"> Draw on the board 1 square. Write '5 cm' as the length of a side. Draw on the board 1 rectangle. Write '10 cm' as the length and '3 cm' as the width. Draw the square and rectangle much larger than 5 or 10 cm, so pupils can see them.
--	--	--

Opening (3 minutes)

- Draw on the board:



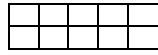
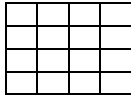
- Tell pupils to look at the square on the board. **Say:** One side of this square is marked 5 centimetres. **Ask:** What is the perimeter? Raise your hand to answer.
- Tell pupils to turn to a partner and say the perimeter. Give pupils a minute to talk to one another.
- Say:** The perimeter of the square is 20 cm. I know the perimeter because there are 4 sides and each side is 5 cm. I can add $5 + 5 + 5 + 5 = 20\text{cm}$ or I can multiply $5 \times 4 = 20\text{cm}$.

Introduction to the New Material (10 minutes)

- Say:** Today we will learn how to find the area of a shape. Area means how many little squares will fit inside the shape. Area tells us how big the inside of the shape is in squares.
- Say:** Each side of the square is 5 centimetres.
- Ask:** How many rows of little squares are there? Raise your hand to answer. (Answer: 5)
- Ask:** How many squares are in each row? Raise your hand to answer. (Answer: 5)
- Count all the small squares with pupils. Point at each square as it is counted.
- Say:** There are 25 little squares inside the big square. Each little square is 1 centimetre. The area of the big square is 25 square centimetres.
- Write 'Area = 25 square centimetres' next to the square.
- Say:** Now look at the rectangle. It has a length of 5 centimetres and a width of 3 centimetres.
- Ask:** How many rows of little squares are there in the rectangle? Raise your hand to answer. (Answer: 3)
- Ask:** How many squares are in each row? Raise your hand to answer. (Answer: 5)
- Count all the small squares with pupils. Point at each square as it is counted.
- Say:** There are 15 little squares inside the rectangle. Each little square is 1 centimetre. The area of the rectangle is 15 square centimetres.
- Write 'Area = 15 square centimetres' next to the rectangle.

Guided Practice (10 minutes)

1. Erase rows from the square so it is 4 x 4. Erase 1 row from the rectangle so it is 5 x 2.



2. Tell pupils to draw the 4 x 4 square in their exercise books.
3. Tell pupils to draw the 5 x 2 rectangle in their exercise books.
4. Write on the board 'Area of square = _____ square cm'. Tell pupils to copy it into their exercise books.
5. Write on the board 'Area of rectangle = _____ square cm'. Tell pupils to copy it into their exercise books.
6. Tell pupils to count the number of squares in each shape and write the area in their notebooks.
7. Go over answers with the pupils. (Answers: Area of square = 16 square cm. Area of rectangle = 10 square cm.)




Independent Practice (10 minutes)

1. **Ask:** How can we draw a shape with an area of 12 squares? Raise your hand to answer. (Example answer: Draw a shape made of 12 squares; This could be a 12 x 1 square, a 4 x 3 square or a 2 x 6 square.)
2. Remind pupils to make each square in their shape the same size.
3. Tell pupils draw a shape with an area of 12 squares. Tell pupils the shape does not have to be a rectangle. They may draw any shape made of 12 squares.
4. Tell pupil to write 'Area = 12 squares' next to their shape.
5. Tell pupils they may draw a second shape with an area of 12 squares, if there is time.

Closing (2 minutes)

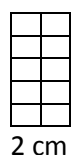
1. Give pupils time to share the shapes they drew with an area of 12 squares with classmates.
2. Lead a short discussion about why shapes that look different can have the same area. (Answer: They all are made of the same number of squares.)
3. Lead a short discussion about why 2 shapes with an area of 12 might be different sizes. (Answer: The squares they are made of might be bigger or smaller than one another.)

Lesson Title: Calculating Area for Rectangles in cm^2 and m^2	Theme: Measurement and Estimation Area	
Lesson Number: M-04-032	Class/Level: Primary 4	Time: 35 minutes

 <p>Learning Outcomes By the end of the lesson, pupils will be able to calculate area for rectangles in cm^2 and m^2.</p>	 <p>Teaching Aids Drawings of rectangles</p>	 <p>Preparation 1. Draw on the board a rectangle. Write '2 cm' as the length and '5 cm' as the width. 2. Draw on the board a rectangle. Write '5 m' as the length and '3 m' as the width. Draw these rectangles with small squares inside.</p>
---	--	--

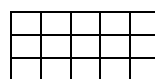
Opening (3 minutes)

1. Draw on the board:



5 m

2 cm



3 m

5 m

- Tell pupils to look at the rectangles on the board. **Say:** Yesterday we learned to count squares to find area. **Ask:** What is the area of each rectangle? Raise your hand to answer.
- Tell pupils silently count the squares to themselves.
- Tell pupils to turn to a partner and say the areas. Give pupils a minute to talk to one another.
- Ask:** What is the area of the first rectangle? Raise your hand to answer. (Answer: 10 square centimetres)
- Ask:** What is the area of the second rectangle? Raise your hand to answer. (Answer: 15 square metres)

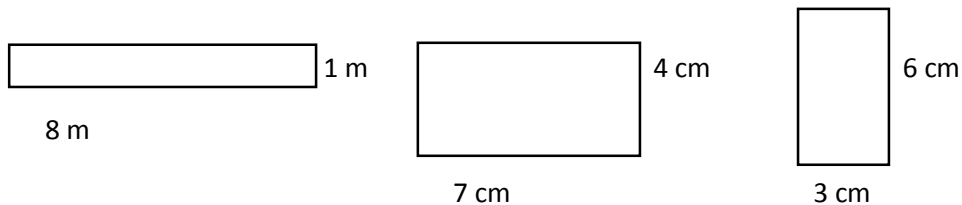
Introduction to the New Material (10 minutes)

- Say:** Today we will learn how to find the area of a rectangle using multiplication. We will also learn to write 'square centimetres' and 'square metres' in a special way.
- Say:** The first rectangle is 5 squares by 2 squares. It has an area of 10 squares. I see I can multiply $5 \times 2 = 10$ to get the area. That way I don't have to count all the squares.
- Say:** Let's see if that works for the second rectangle. We said the second rectangle had an area of 15 square metres.
- Ask:** What is the length? Raise your hand to answer. (Answer: 5 metres)
- Ask:** What is the width? Raise your hand to answer. (Answer: 3 metres)
- Say:** What is 5 times 3? Raise your hand to answer. (Answer: 15)
- Say:** Did we get the same answer by multiplying as we did when we counted. Put your thumb up if you agree we can multiply to find area. (Answer: Pupils give a 'thumbs up' to signal they agree.)
- Ask:** How many sides do we multiply to find the area of a rectangle? Raise your hand to answer. (Answer: multiply 2 sides)
- Say:** Yes, we multiply 2 sides to find the area of a rectangle. The area is in squares.

- Write on the board ' cm^2 '. **Say:** We read this as square centimetres. The little '2' means 'square'. It also reminds us to multiply 2 numbers to get the area.
- Ask:** How do you think we read ' m^2 '? Raise your hand to answer. (Answer: square metres)

Guided Practice (10 minutes)

- Draw several rectangles on the board.



- Tell pupils to carefully copy the rectangles in their exercise books.
- Tell pupils to write the length of the sides in their exercise books.
- Write on the board 'Area = _____ m^2 '. Tell pupils to copy it into their exercise books.
- Write on the board 'Area = _____ cm^2 '. Tell pupils to copy it into their exercise books.
- Write on the board 'Area = _____ cm^2 '. Tell pupils to copy it into their exercise books.
- Ask:** How are we going to find the area of these rectangles? Raise your hand to answer. (Answer: multiply the 2 sides)




Independent Practice (10 minutes)

- Tell pupils to find the area of the 3 rectangles. They should write the area in their exercise books.
- Tell pupils they may draw a rectangle of their own, if there is time. They should write the length of 2 of the sides and find the area.
- Challenge problem: If the area of a rectangle is 40 cm^2 and one side is 10 cm^2 , what is the length of the other side? (Answer: $40 \text{ cm}^2 \div 10 \text{ cm}^2 = 4 \text{ cm}^2$)

Closing (2 minutes)

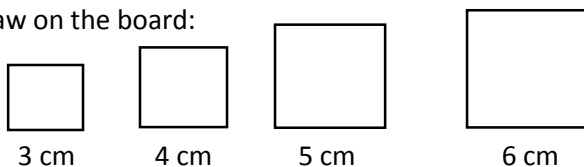
- Give pupils time to share their answers with a classmate.
- Write on the board the answers to the problems.
- Read them aloud with pupils. Read ' m^2 ' as 'square metres.' Read ' cm^2 ' as 'square centimetres.' (Answers: $8 \times 1 = 8$, Area = 8 cm^2 , $7 \times 4 = 28$, Area = 28 cm^2 , $6 \times 3 = 18$, Area = 18 cm^2)

Lesson Title: Calculating Area for Squares in cm^2 and m^2	Theme: Measurement and Estimation Area	
Lesson Number: M-04-033	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to calculate area for squares in cm^2 and m^2 .		Teaching Aids Drawings of squares		Preparation Draw 4 squares on the board.
---	---	---	---	---	--

Opening (3 minutes)

1. Draw on the board:



2. Tell pupils to look at the squares on the board.
3. **Ask:** How long are the other sides of the first square. Raise your hand to answer. (Answer: 3 cm)
4. **Ask:** How long are the other sides of the second square. Raise your hand to answer. (Answer: 4 cm)
5. **Ask:** How long are the other sides of the third square. Raise your hand to answer. (Answer: 5 cm)
6. **Ask:** How long are the other sides of the fourth square. Raise your hand to answer. (Answer: 6 cm)

Introduction to the New Material (10 minutes)

1. **Say:** Yesterday, we learned how to multiply to find the area of a rectangle. Today we will learn how to find the area of a square using multiplication.
2. **Say:** We need to multiply 2 sides to find area.
3. **Ask:** What numbers do we multiply to find the area of the first square? Raise your hand to answer. (Answer: 3×3)
4. **Ask:** What is the area of the first square? Raise your hand to answer. (Answer: 9 square centimetres)
5. **Ask:** How do we write 9 square centimetres?
6. Choose a pupil to come to the board and write '9 cm^2 '. Read it aloud with pupils.
7. Teach pupils the area chant. First, chant it to the pupils while they listen. Next ask them to join in. Chant 3 times with pupils.
'The area's inside. The area's inside.
Length times width is area. The area's inside.
The area is squares. The area is squares.
Square metres and square centimetres
Multiply to find.'
8. Tell pupils to copy the 4 squares on the board into their exercise books.

Guided Practice (10 minutes)

1. Tell pupils to work in groups of 3 to find the area of each square.
2. Tell pupils to quietly talk with their group about the area for each square.
3. When the group agrees, each pupil writes the multiplication problem and answer in their own exercise book.
4. Remind pupils to write 'Area = ____ cm²'.
5. Choose pupils to come to the board and write the answers to the problems. Guide them to write both the multiplication problem and the answer.
6. Guide them to write the area as 'cm²'.
7. Ask the class to read each answer aloud. Guide them to read 'cm²' as 'square centimetres'.
(Answers: $3 \times 3 = 9$, Area = 9 cm², $4 \times 4 = 16$, Area = 16 cm², $5 \times 5 = 25$, Area = 25 cm², $6 \times 6 = 36$, Area = 36 cm²)




Independent Practice (10 minutes)

1. Tell pupils to draw a square in their exercise book.
2. Tell them to write 7 metres for the length of 1 side.
3. Tell pupils to find the area of the square.
4. Repeat for squares with sides that measure 8 cm, 10cm, 1cm)

Closing (2 minutes)

1. Give pupils time to share their answers with a classmate.
2. Write on the board the answers to the problems.
3. Read them aloud with pupils. Read 'm²' as 'square metres'. (Answers: $7 \times 7 = 49$, Area = 49 m²; $8 \times 8 = 64$, Area = 64 cm²; $10 \times 10 = 100$, Area = 100 cm²; $1 \times 1 = 1$, Area = 1 cm²)
4. **Say:** Good job today, pupils! You measured the area for a number of squares!

Lesson Title: Understanding the Relationship Between Area and Perimeter	Theme: Measurement and Estimation Area	
Lesson Number: M-04-034	Class/Level: Primary 4	Time: 35 minutes

	<p>Learning Outcomes: By the end of the lesson, pupils will be able to:</p> <ol style="list-style-type: none"> 1. Draw rectangles that have a given perimeter and area. 2. Know the difference between area and perimeter. 		<p>Teaching Aids</p> <ol style="list-style-type: none"> 1. Drawings of rectangles 2. Factor matrices in pupil's exercise books from Lesson 10 		<p>Preparation</p> <p>Draw on the board 2 rectangles large enough for pupils to see.</p>
---	---	---	--	---	---

Opening (3 minutes)

1. Review the perimeter and area chants. With the class, sing or chant:

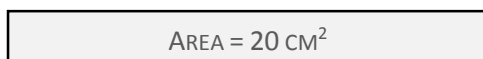
'The perimeter's around. The perimeter's around
Oh, oh, don't you know, the perimeter's around.
You add up all the sides. You add up all the sides
Oh, oh, don't you know, you add up all the sides.

The area's inside. The area's inside.
Length times width is area. The area's inside.
The area is squares. The area is squares.
Square metres and square centimetres
Multiply to find.'

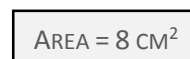
2. Tell pupils to take out their exercise books and find the factor matrices that show all the factors to 20.

Introduction to the New Material (10 minutes)

1. **Say:** We have been learning about perimeter and area. Today we will learn how to draw a rectangle with a given perimeter and area.
2. **Say:** Look at the first rectangle.



Perimeter = 24 cm



Perimeter = 12 cm

3. **Say:** The area of the first rectangle is 20 cm^2 . The perimeter is 14 cm. We need to find the length and width of the sides.
4. Write on the board '? x ? = 20'. **Say:** We can use what we know about factors to help us solve this problem.
5. **Ask:** What are the factors of 20? Raise your hand to answer. (Answer: 1, 2, 4, 5, 10, 20)
6. **Ask:** What multiplication problems can we write with an answer of 20? Raise your hand to answer. (Answer: 1×20 , 2×10 , 4×5)

7. Remind pupils that the order of factors does not matter in multiplication, so 20×1 is the same as 1×20 , 2×10 is the same as 10×2 , and 4×5 is the same as 5×4 .
8. Write on the board ' $? + ? + ? + ? = 20$ '. **Say:** The perimeter is 24 cm. We will need to add the sides to find the perimeter.
9. **Say:** I am going to try 1×20 to see if those numbers work for area and perimeter.
10. Write on the board ' $1 \times 20 = 20$ '. **Ask:** Does 1×20 equal 20? Raise your hand to answer. (Answer: Yes.)
11. Write on the board ' $1 + 1 + 20 + 20 = ?$ '. **Ask:** Does $1 + 1 + 20 + 20 = 24$? Raise your hand to answer. (Answer: No.)
12. **Say:** The numbers work for area. They do not work for perimeter. The sides of this rectangle can't be 1 and 20.
13. Erase ' $1 \times 20 = 20$ ' and ' $1 + 1 + 20 + 20 = 24$ ' from the board.
14. **Say:** I am going to try 2×10 to see if those numbers work for area and perimeter.
15. Write on the board ' $2 \times 10 = 20$ '. Raise your hand to answer. **Ask:** Does 2×10 equal 20? (Answer: Yes.)
16. Write on the board ' $2 + 2 + 10 + 10 = 24$ '. **Ask:** Does $2 + 2 + 10 + 10 = 24$? Raise your hand to answer. (Answer: Yes.)
17. **Say:** The numbers work for area. The numbers work for perimeter. The sides of this rectangle are 2 cm and 10 cm.
18. Leave ' $2 \times 10 = 20$ ' and ' $2 + 2 + 10 + 10 = 24$ ' to help pupils remember how to solve the problem.

Guided Practice (10 minutes)

1. Tell pupils they will work in groups of 3 to find how long the sides of the second rectangle are.
2. Remind pupils to use the factors of 8 to solve the problem.
3. Allow time for pupils to work together to solve the problem.
4. Tell pupils to draw the rectangle and write the length of the sides. (Answer: The sides are 2 cm and 4 cm, $2 \times 4 = 8$, $2 + 2 + 4 + 4 = 12$)




Independent Practice (10 minutes)

1. Write on the board 'Area = 20 cm^2 Perimeter = 18 cm'.
2. **Say:** There is a rectangle with an area of 20 cm^2 and a perimeter of 18 cm. First, find how long the sides are. Then, draw the rectangle and write the length of the sides.
3. After pupils solve the problem, ask them to share their answers with a classmate.
4. Go over the answer together as a class. (Answer: The sides are 5 cm and 4 cm.)

Closing (2 minutes)

1. Ask pupils to explain the difference between perimeter and area to a classmate.
2. Ask 1 or 2 pupils to share their ideas with the class. (Example answers: The perimeter is the outside, and the area is the inside. The perimeter is how long all the sides are all together and the area is how many squares fit inside. You can add to find perimeter, and you have to multiply to find area.)

Lesson Title: Word Problems About Area and Perimeter	Theme: Measurement and Estimation Area	
Lesson Number: M-04-035	Class/Level: Primary 4	Time: 35 minutes

 Learning Outcomes By the end of the lesson, pupils will be able to solve word problems about area and perimeter.	 Teaching Aids None	 Preparation None
--	--	--

Opening (3 minutes)

1. Review the perimeter and area chants. With the class, sing or chant:

‘The perimeter’s around. The perimeter’s around
 Oh, oh, don’t you know, the perimeter’s around.
 You add up all the sides. You add up all the sides
 Oh, oh, don’t you know, you add up all the sides.

The area’s inside. The area’s inside.
 Length times width is area. The area’s inside.
 The area is squares. The area is squares.
 Square metres and square centimetres
 Multiply to find.’

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn how to solve word problems about area and perimeter.
2. Tell pupils this story: The grade 4 pupils want to plant a school vegetable garden. The Head Teacher says they can use a 6 metre by 3 metre area shaped like a rectangle for their garden. How big is the garden in square metres?
3. **Ask:** Do we need to find area or perimeter to solve this problem?
4. Turn to a partner and talk about what you think. Give pupils 1 minute to talk.
5. **Say:** Raise 1 finger if you think it is ‘area’. Raise 2 fingers if you think it is ‘perimeter’. (Answer: Area –Pupils should raise 1 finger.)
6. **Ask:** How do you know it is area? Raise your hand to answer. (Answer: It asks about square metres. Square metres mean area.)
7. **Ask:** How do we solve this problem? Raise your hand to answer. (Answer: Multiply 6 metres times 3 metres.)
8. **Say:** You will solve the problem later to find the area.
9. Tell pupils this story: The grade 4 pupils want to plant a school vegetable garden. The Head Teacher says they can use a 6 metre by 3 metre area shaped like a rectangle for their garden. They want to build a fence around the garden. How much fencing do they need?
10. **Ask:** Do we need to find area or perimeter to solve this problem?
11. Turn to a partner and talk about what you think. Give pupils 1 minute to talk.
12. **Say:** Raise 1 finger if you think it is ‘area’. Raise 2 fingers if you think it is ‘perimeter’. (Answer: Perimeter – Pupils should raise 2 fingers.)

13. **Ask:** How do you know it is perimeter? Raise your hand to answer. (Answer: Perimeter goes around the outside, like a fence.)
14. **Ask:** How do we solve this problem? Raise your hand to answer. (Answer: Add 6 metres + 6 Metres + 3 metres + 3 metres.)
15. **Say:** You will solve the problem later to find the perimeter.

Guided Practice (10 minutes)

1. **Ask:** How can you draw a simple picture to show the garden in the story? Raise your hand to answer. (Answer: Draw a rectangle.)
2. Have pupils draw a rectangle in their exercise book.
3. Tell pupils the first story about the garden again.
4. Tell them to write '6 m' and '3 m' to show the length the sides.
5. Ask pupils to solve the problem. Remind them to multiply to find area. (Answer: $6 \times 3 = 18 \text{ m}^2$)
6. Tell pupils the second story about the garden again.
7. Ask pupils to solve the problem. Remind them to add to find perimeter. (Answer: $6 \text{ m} + 6 \text{ m} + 3 \text{ m} + 3 \text{ m} = 18 \text{ m}$)




Independent Practice (10 minutes)

1. Tell pupils this story: Yeama is cutting out some fabric. She cuts a small piece with an area of 20 cm^2 . One side of the fabric is 4 centimetres long. How long is the other side?
2. Tell pupils to draw a rectangle in their exercise book.
3. Tell the story again.
4. Tell pupils solve the problem in their exercise books.
5. Tell pupils this story: Yusuff wants to build a fence around a field. One side of the field is 10 metres. The other side of the field is 12 metres. How much fencing does Yusuff need?
6. Tell pupils to draw a rectangle in their exercise book.
7. Tell the story again.
8. Tell pupils solve the problem in their exercise books.

Closing (2 minutes)

1. Go over answers with pupils. (Answers: The other side of Yeama's fabric is 5 cm, $5 \times 4 = 20 \text{ cm}^2$, Yusuff needs 44 metres of fence, $10 + 10 + 12 + 12 = 44 \text{ m}$)
2. **Say:** Good job today, pupils! You solved many word problems involving finding area and perimeter.

Lesson Title: Estimating Mass Comparatively Using Non-Standard Measurement	Theme: Measurement and Estimation Mass	
Lesson Number: M-04-036	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to compare different weights physically using non-standard measurement.		Teaching Aids Small objects of various weights		Preparation Gather small objects such as sheet of newspaper, small rocks, sticks, leaves, or empty and full tins.
---	---	---	--	---	---

Opening (3 minutes)

1. **Ask:** What objects are heavy to carry?
2. **Say:** Share your ideas with a partner.
3. Choose 1 or 2 pupils to share their ideas with the class. (Example answers: a bucket with water, a small child, a big bag filled with yams)
4. **Ask:** What objects are light to carry?
5. **Say:** Share your ideas with a partner.
6. Choose 1 or 2 pupils to share their ideas with the class. (Example answers: an empty bucket, 1 egg, a plastic bag)

Introduction to the New Material (10 minutes)

1. **Say:** Today we will compare things to see which weigh more.
2. Talk about the meaning of light and heavy.
3. Have pupils say if objects are heavy or light. Ask pupils about objects like leaves, tree branches, pebbles, rocks, newspaper, tins, empty water bucket, full water buckets. **Ask:** Is this object heavy or light?
4. Tell pupils to pick up their exercise book with 1 hand. Tell pupils to pick up their pencil in their other hand.
5. **Ask:** Which weighs more? Raise your hand to answer. (Answer: the exercise book)
6. **Ask:** Which weighs less? Raise your hand to answer. (Answer: the pencil)
7. Show pupils how to act as a 'human balance' to weigh objects.
8. Tell pupil to hold the hand with the pencil up. Tell pupils to hold the hand with the exercise book down. Tell pupils that heavy objects weigh more. They make a 1 side of balance scale go down. The side with light objects weighs less. It goes up.
9. Show the class a handful of rocks and a handful of leaves. **Ask:** What do you think weighs more, a handful of rocks or a handful of leaves? Raise your hand to answer. (Answer: a handful of rocks)
10. **Ask:** What do you think weighs less? Raise your hand to answer. (Answer: a handful of leaves)
11. **Ask:** Which hand goes up? Raise your hand to answer. (Answer: the hand with leaves in it)
12. **Ask:** Which hand goes down? Raise your hand to answer. (Answer: the hand with rocks in it)

Guided Practice (10 minutes)

1. Give 4 small objects to each group of 4 pupils, for example, a sheet of newspaper, small rocks, sticks, leaves, or empty and full tins.
2. Tell pupils they will work together to order the objects in a line on their table.
3. Tell pupils to place the heaviest object at the start of the line of objects. Tell pupils to place the lightest objects at the end of the line of objects.
4. Explain the rules for the activity:
 - a) One pupil at a time can pick up 2 objects.
 - b) The pupil holds the objects for a count of 5.
 - c) The pupils discuss which is heavier.
 - d) The pupils decide where to put the object in line on the table.
 - e) The next person gets a turn.




Independent Practice (10 minutes)

1. Ask pupils draw the objects in their exercise book from heaviest to lightest.
2. Tell pupils to write a sentence to explain how they know which object is heaviest.

Closing (2 minutes)

1. **Ask:** What was hard about ordering the objects?
2. Choose 2 or 3 pupils to share what was hard for them and their groups.
3. **Say:** Good job today, pupils! You estimated the weight of heavy and light objects by being a human scale!

Lesson Title: Calculating Mass Using Kilograms	Theme: Measurement and Estimation Mass	
Lesson Number: M-04-037	Class/Level: Primary 4	Time: 35 minutes

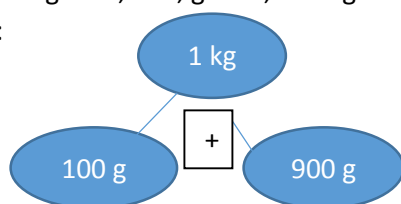
	Learning Outcomes By the end of the lesson, pupils will be able to calculate mass in kilograms.		Teaching Aids A 1-litre bottle filled with water		Preparation 1. Gather a 1-litre bottle. 2. Fill the bottle with water. 3. Draw on the board 3 number circles.
---	---	---	--	---	---

Opening (3 minutes)

1. Choral count aloud as a class 3s to 30, forward and backwards.
2. Choral count aloud as a class 4s to 40, forward and backwards.
3. Choral count aloud as a class 6s to 60, forward and backwards.
4. Choral count aloud as a class 7s to 70, forward and backwards.
5. **Ask:** How many 3s are in 30? Raise your hand to answer. (Answer: 10)
6. **Ask:** How many 4s are in 40? Raise your hand to answer. (Answer: 10)
7. **Ask:** How many 6s are in 60? Raise your hand to answer. (Answer: 10)
8. **Ask:** How many 7s are in 70? Raise your hand to answer. (Answer: 10)

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn about kilograms and how to do mathematics with kilograms.
2. Show pupils the 1-litre bottle filled with water.
3. **Say:** This is a 1-litre bottle filled with water. This bottle weighs 1 kilogram.
4. Explain that the words 'kilo' and 'kilogram' mean the same thing. 'Kilo' is a shorter way of saying kilogram.
5. **Say:** One kilogram is the same as 1000 grams. Count to 1 kilogram with me by 100 grams. This is like skip counting by 100.
6. Have pupils count with you. **Say:** 100 grams, 200 grams, 300 grams, 400 grams, 500 grams, 600 grams, 700 grams, 800 grams, 900, grams, 1 kilogram.
7. **Draw** on the board:



8. **Say:** These circles show 1 way to make 1 kilogram with grams.
9. Have pupils read the addition problem in the circles with you: 100 grams + 900 grams = 1,000 grams = 1 kilogram.
10. Erase the 100 and 900. Write 500 and 500 in the bottom circles.
11. Have pupils read the addition problem in the circles aloud with you: 500 grams + 500 grams = 1,000 grams = 1 kilogram.
12. Repeat steps 10 and 11 with the following numbers: 750 and 250; 800 and 200; and 400 and 600.

13. Erase 400 and 600 from the bottom circles. Write 300 in the bottom left circle.
14. **Ask:** What number goes in the other circle? Raise your hand to answer. (Answer: 700)
15. Have pupils read the addition problem in the circles aloud with you: $300 \text{ grams} + 700 \text{ grams} = 1,000 \text{ grams} = 1 \text{ kilogram}$.
16. Repeat steps 10 to 12 with the other numbers:
 - a) 850 grams (Answer: 150 grams)
 - b) 950 (Answer: 50 grams)

Guided Practice (10 minutes)

1. Tell the pupils this story: Mr. Bah put 1 kilogram of rice on 1 side of a balance scale. How many 100-gram bags of rice does he need to balance the scale? How many 100-gram bags of rice equal 1 kilogram of rice?
2. Draw on the board:

100 g	100g								
-------	------	--	--	--	--	--	--	--	--

3. Tell pupils to copy the matrix into their exercise books.
4. Tell pupils to complete the matrix by writing 100 g in each box. Allow time for pupils to complete the matrix.
5. Count aloud with the class the grams in the completed matrix. **Say:** 100 grams, 200 grams, 300 grams, 400 grams, 500 grams, 600 grams, 700 grams, 800 grams, 900, grams, 1000 grams.
6. **Ask:** How many grams does your matrix show? Raise your hand to answer. (Answer: 1000 grams)
7. **Ask:** How many kilograms does your matrix show? Raise your hand to answer. (Answer: 1 kilogram)
8. **Ask:** How many 100-gram bags of rice equal 1 kilogram of rice? (Answer: 10)




Independent Practice (10 minutes)

1. Tell the pupils this story: Mrs. Bah has 1 kilogram of rice at her shop. She sells 300 grams on Monday. How much rice does Mrs. Bah have left?
2. Tell pupils to write in their exercise books and solve: $1\text{kg} - 300 \text{ g} = \underline{\hspace{2cm}}$.
3. Remind pupils to use the matrix to help them solve the problem.
4. Repeat the story with other numbers as time allows. For example, Mrs. Bah has 1 kilogram of rice at his shop. He sells 400 grams on Tuesday. How much rice does Mrs. Bah have left?
5. Tell pupils to write in their exercise books and solve: $1\text{kg} - 400 \text{ g} = \underline{\hspace{2cm}}$.

Closing (2 minutes)

1. Have pupils check their answers to independent practice with a partner.
2. Go over answers with the class. (Answers: Mrs Bah has 700 grams of rice left. $1 \text{ kg} - 300 \text{ g} = 1000 \text{ g} - 300\text{g} = 700\text{g}$. Mr Bah has 600 grams of rice left. $1 \text{ kg} - 400 \text{ g} = 1000\text{g} - 400 \text{ g} = 600 \text{ g}$.)

Lesson Title: Converting Mass: Kilograms and Local Measurement	Theme: Measurement and Estimation Mass	
Lesson Number: M-04-038	Class/Level: Primary 4	Time: 35 minutes

	<p>Learning Outcomes</p> <p>By the end of the lesson, pupils will be able to calculate conversion between kilograms and buttercups.</p>		<p>Teaching Aids</p> <ol style="list-style-type: none"> 1. Empty 1-litre bottle 2. Buttercup 3. Water 		<p>Preparation</p> <ol style="list-style-type: none"> 1. Gather a 1-litre bottle. 2. Gather a buttercup. 3. Put about a litre of water in a bucket.
---	--	---	---	---	---

Opening (3 minutes)

1. Review that there are 1000 grams in a kilogram by counting aloud as a class. **Say:** 100 grams, 200 grams, 300 grams, 400 grams, 500 grams, 600 grams, 700 grams, 800 grams, 900, grams, 1 kilogram.
2. Have pupils copy and solve:
 - a) $100\text{ g} + 900\text{ g} =$ (Answer: 1 kg)
 - b) $200\text{ g} + 800\text{ g} =$ (Answer: 1 kg)
 - c) $1\text{ kg} - 100\text{ g} =$ (Answer: 900 g)
 - d) $1\text{ kg} - 800\text{ g} =$ (Answer: 200 g)

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn how many buttercups are in a kilogram.
2. Show pupils the 1-litre bottle and the buttercup.
3. **Say:** This is a 1-litre bottle. When it is filled with water, it weighs 1 kilogram.
4. Explain that you are using water, because rice and maize weigh a different amount than water. One litre of rice does not weigh a kilogram.
5. **Say:** I am going to fill the 1-litre bottle with buttercups to see how many buttercups are in a kilogram.
6. Ask pupils to think silently about how many buttercups they think are in a kilogram.
7. Ask pupils to talk with 2 classmates about how many buttercups they think are in a kilogram.
8. Choose 2 or 3 pupils to share their ideas.
9. Fill the buttercup with water. Pour it into the 1-litre bottle.
10. Count 1. Write 1 tick mark on the board.
11. Fill the buttercup with water. Pour it into the 1-litre bottle.
12. Count 2. Write another tick mark on the board.
13. Continue filling the bottle and counting for about 7 counts.
14. Show the bottle to pupils. **Ask:** How many more buttercups do you think I need to fill the bottle? (Example answers: 1, 2 or 3)
15. Continue filling the bottle until it is full. This should be about 10.
16. **Say:** There are about 10 buttercups in 1 kilogram. It is not exactly 10. It is close to 10.
17. Write on the board: $1\text{ kg} \approx 10$ buttercups
18. Remind pupils that the \approx means 'about the same size'.

Guided Practice (10 minutes)

1. Tell the pupils this story: Mr Bah put 1 kilogram of water on 1 side of a balance scale. About how many buttercups of water does he need to balance the scale?
2. Draw on the board:

1 buttercup	1 buttercup										
----------------	----------------	--	--	--	--	--	--	--	--	--	--

3. Tell pupils to copy the matrix into their exercise books.
4. Tell pupils to complete the matrix by writing 1 buttercup in each box. Allow time for pupils to complete the matrix.
5. Count aloud with the class the buttercups in the completed matrix. **Say:** 1 buttercup, 2 buttercups, 3 buttercups, 4 buttercups, 5 buttercups, 6 buttercups, 7 buttercups, 8 buttercups, 9 buttercups, 1 kilogram.
6. **Ask:** How many buttercups does your matrix show? (Answer: 10 buttercups)
7. **Ask:** How many kilograms does your matrix show? (Answer: 1 kilogram)
8. **Ask:** How many buttercups of water equal 1 kilogram? (Answer: 10)




Independent Practice (10 minutes)

1. Tell the pupils this story: Mrs Bah has 3 buttercups of water. About how much more does she need to make a kilogram?
2. Tell pupils to solve this problem in their exercise books.
3. Remind pupils to use the matrix to help them solve the problem.
4. Tell the pupils this story: Mr Bah has 20 buttercups of water. About how many kilograms does the water weigh?

Closing (2 minutes)

1. Have pupils check their answers to independent practice with a partner.
2. Go over answers with the class. (Answers: Mrs Bah needs about 7 more buttercups. 3 buttercups + 7 buttercups \approx 1 kg. Mr Bah has about 2 kg of water.)

Lesson Title: Word Problems About Mass Using Addition and Subtraction	Theme: Measurement and Estimation Mass	
Lesson Number: M-04-039	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to solve word problems about mass using addition and subtraction.		Teaching Aids None		Preparation None
---	---	---	------------------------------	---	----------------------------

Opening (3 minutes)

- Review that there are 1000 grams in a kilogram by counting aloud as a class. **Say:** 100 grams, 200 grams, 300 grams, 400 grams, 500 grams, 600 grams, 700 grams, 800 grams, 900, grams, 1 kilogram.
- Have pupils copy and solve:
 - $150\text{ g} + 850\text{ g} =$ (Answer: 1 kg)
 - $250\text{ g} + 750\text{ g} =$ (Answer: 1 kg)
 - $1\text{ kg} - 150\text{ g} =$ (Answer: 850 g)
 - $1\text{ kg} - 750\text{ g} =$ (Answer: 250 g)

Introduction to the New Material (10 minutes)

- Say:** Today we will learn how to solve word problems about mass using addition and subtraction.
- Tell pupils this story: An apple has a mass of 250 grams. How many apples are in a kilogram?
- Ask:** Do we need to add or subtract to solve this problem?
- Say:** Turn to a partner and talk about what you think.
- Give pupils 1 minute to talk. **Say:** Raise 1 finger if you think we need to add. Raise 2 fingers if you think we need to subtract. (Answer: Add. Pupils should raise 1 finger.)
- Ask:** How do you know to add? (Answer: 250 grams is less than 1 kilogram. You need to add to get to 1 kilogram.)
- Ask:** How do we solve this problem? Raise your hand to answer. (Answer: Add 250s until you get to 1000).
- Say:** You will solve the problem later to find how many apples you need.
- Tell pupils this story: The mass of an orange is 600 grams. The mass of a banana is 120 grams less than the mass of the orange. What is the mass of the banana?
- Ask:** Do we need to add or subtract to solve this problem? Raise your hand to answer.
- Say:** Turn to a partner and talk about what you think.
- Give pupils 1 minute to talk. **Say:** Raise 1 finger if you think we need to add. Raise 2 fingers if you think we need to subtract. (Answer: Subtract. Pupils should raise 2 fingers.)
- Ask:** How do you know to subtract? Raise your hand to answer. (Answer: The banana weighs less than the orange.)
- Ask:** How do we solve this problem? Raise your hand to answer. (Answer: Subtract $600 - 120$.)
- Say:** You will solve the problem later to find the mass of the banana.

Guided Practice (10 minutes)

1. Tell pupils the first story about the apple again.
2. **Ask:** How much is $250 + 250$? Raise your hand to answer. (Answer: 500)
3. **Ask:** Is 500 grams more than or less than 1 kilogram? (Answer: Less)
4. **Ask:** Do we need to keep adding 250 grams? Raise your hand to answer. (Answer: Yes)
5. Tell pupils to work with a partner to keep adding 250 grams until they get to 1 kilogram.
6. Remind pupils that 1 kilogram is 1000 grams.
7. Go over the answer with pupils. (Answer: $240\text{ g} + 250\text{ g} + 250\text{ g} + 250\text{ g} = 1000\text{ g} = 1\text{ kg}$)
8. Tell pupils the second story about the orange and banana again.
9. Ask pupils to solve the problem.
10. Go over the answer. (Answer: $600\text{ g} - 120\text{ g} = 480\text{ g}$)




Independent Practice (10 minutes)

1. Tell pupils this story: Yeama has 1 kg of rice. She uses 760 g to cook dinner for the family. How much rice does she have left?
2. Tell the story again.
3. Tell pupils to solve the problem in their exercise books.
4. Tell pupils this story: The mass of a banana is 480 g. The mass of an apple is 250 g. How much do 2 apples and 1 banana weigh in all?
5. Tell the story again.
6. Remind pupils they need to add 2 apples plus 1 banana.
7. Tell pupils to solve the problem in their exercise books.

Closing (2 minutes)

1. Go over answers with pupils. (Answers: Yeama has 240 g of rice left. $1000\text{ g} - 760\text{ g} = 240\text{ g}$. The apples and banana weigh 980 g in all. $250\text{ g} + 250\text{ g} + 480\text{ g} = 980\text{ g}$)
2. **Say:** Good job today, pupils! You solved word problems involving kilograms by addition and subtraction.

Lesson Title: Word Problems About Mass Using Four Operations	Theme: Measurement and Estimation Mass	
Lesson Number: M-04-040	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to solve word problems about mass using the 4 operations.		Teaching Aids None		Preparation Write the word problems on the board.
---	---	---	------------------------------	---	---

Opening (3 minutes)

1. Review multiplication by 100 by chanting together as a class. **Say:** $100 \times 1 = 100$, $100 \times 2 = 200$, $100 \times 3 = 300$, $100 \times 4 = 400$, $100 \times 5 = 500$, $100 \times 6 = 600$, $100 \times 7 = 700$, $100 \times 8 = 800$, $100 \times 9 = 900$, $100 \times 10 = 1000$.
2. Remind pupils that they can use multiplication to solve division.
3. **Say:** $100 \times 5 = 500$ and $500 \div 5 = 100$.
4. **Ask:** What is $400 \div 4$? Raise your hand to answer. (Answer: 100)
5. **Ask:** What is $1000 \div 10$? Raise your hand to answer. (Answer: 100)

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn how to solve word problems about mass using addition, subtraction, multiplication and division.
2. Tell pupils this story: Mr. Bah has a shop. He sells 480 g of rice on Monday. He sells 630 g of rice on Tuesday. Does Mr. Bah sell more than or less than 1 kg of rice?
3. **Ask:** Do we need to add or subtract to solve this problem?
4. **Say:** Turn to a partner and talk about what you think.
5. Give pupils 1 minute to talk. **Say:** Raise 1 finger if you think we need to add. Raise 2 fingers if you think we need to subtract. (Answer: Add. Pupils should raise 1 finger.)
6. **Ask:** How do you know to add? Raise your hand to answer. (Answer: We need to find out how much $480 + 630$ is.)
7. **Ask:** How do we solve this problem? Raise your hand to answer. (Answer: Add $480 + 630$. Then, see if that is more than or less than 1 kg.)
8. Tell pupils they will solve the problem later.
9. Tell pupils this story: Mr. Bah has a shop. He sells 480 g of rice on Monday. He sells 630 g of rice on Tuesday. How much more rice does Mr. Bah sell on Tuesday than on Monday?
10. **Ask:** Do we need to add or subtract to solve this problem?
11. **Say:** Turn to a partner and talk about what you think.
12. Give pupils 1 minute to talk. **Say:** Raise 1 finger if you think we need to add. Raise 2 fingers if you think we need to subtract. (Answer: Subtract. Pupils should raise 2 fingers.)
13. **Ask:** How do we solve this problem? Raise your hand to answer. (Answer: Subtract $630 - 480$.)
14. Tell pupils this story: A box has 10 bags of sugar in it. Each bag of sugar weighs 500 g. How many grams does the box weigh? How many kilograms does the box weigh?
15. **Ask:** What can we multiply to find out how many grams the bags weigh? Raise your hand to answer. (Answer: 10×500)

16. **Ask:** How can we divide to find out how many kilograms that is? Raise your hand to answer.
(Answer: Divide the answer by 1000.)

Guided Practice (10 minutes)

1. Tell pupils the first story about Mr. Bah again.
2. Tell pupils to write and solve $480\text{ g} + 630\text{ g}$. (Answer: 1030 g)
3. **Ask:** Is 1030 grams more than or less than 1 kilogram? Point your thumb up if it is more. Point your thumb down if it is less. (Answer: It is more. Pupils point their thumbs up.)
4. Revise the question for the word problem 'Does Mr. Bah sell more than or less than 1 kg of rice?'
5. **Say:** We need to answer this question. The question asks if he sells more than or less than 1 kg of rice. We can say a sentence to answer the question. Ask: What sentence can we say?
(Answer: Mr. Bah sells more than 1 kilogram.)
6. Tell pupils the second story about Mr. Bah again.
7. Ask pupils to write and solve the subtraction problem.
8. Go over the answer with pupils. (Answer: $630\text{ g} - 480\text{ g} = 150\text{ g}$. He sells 150 grams more on Tuesday than on Monday.)




Independent Practice (10 minutes)

1. Tell pupils the story about the sugar again.
2. Tell pupils to solve the problem in grams using multiplication. They should write the problem and answer in their exercise books.
3. Go over the answer with pupils. (Answer: $500\text{ g} \times 10 = 5000\text{ g}$)
4. Tell pupils to divide to find out the number of kilograms. (Answer: $5000\text{ g} \div 1000 = 5\text{ kg}$)

Closing (2 minutes)

1. Discuss why you need to divide by 1000 to change 5000 grams to kilograms.
2. **Say:** There are 1000 grams in 1 kg so we divide 5000 grams by 1000 grams to find the number of kilograms.
3. **Say:** Good job today, pupils! You solved many word problems about mass involving all four operations.

Lesson Title: Using Sticks to Find and Describe Number Patterns	Theme: Algebra	
Lesson Number: M-04-041	Class/Level: Primary 4	Time: 35 minutes

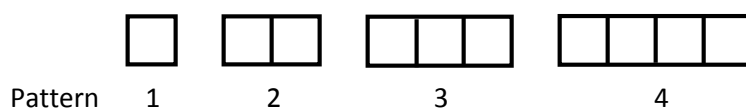
	Learning Outcomes By the end of the lesson, pupils will be able to use sticks to find and describe number patterns.		Teaching Aids 1. Large straight sticks 2. Drawings of patterns made with sticks		Preparation 1. Gather 4 straight sticks large enough for pupils to see. 2. Draw on the board the pattern of squares.
---	---	---	--	--	---

Opening (3 minutes)

1. Review number patterns.
2. **Say:** I will say a number. The class will say the number that is 2 more. If I say 2, the class says 4.
3. **Say:** 2 (Answer: 4), 12 (Answer: 14), 22 (Answer: 24), 32 (Answer: 34), 42 (Answer: 44)
4. **Say:** I will say a number. The class will say the number that is 3 more. If I say 3, the class says 6.
5. **Say:** 3 (Answer: 6), 13 (Answer: 16), 23 (Answer: 26), 33 (Answer: 36), 43 (Answer: 46)

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to learn how to find number patterns using sticks.
2. Show pupils 1 large stick. **Ask:** How many more sticks do I need to make a square? Raise your hand to answer. (Answer: 3)
3. Choose 3 pupils to come to the front. Hold 1 stick. Give 1 stick to each pupil. Form a square.
4. Show pupils the pattern of squares drawn on the board.

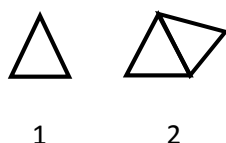


5. **Say:** I made a pattern of sticks. I drew it on the board. We are going to look at the drawing and find the pattern.
6. **Ask:** How many squares are in the first pattern? Raise your hand to answer. (Answer: 1)
7. **Ask:** How many sticks? Count the sticks. Raise your hand to answer. (Answer: 4)
8. **Ask:** How many squares are in the second pattern? Raise your hand to answer. (Answer: 2)
9. **Ask:** How many sticks? Count the sticks. Raise your hand to answer. (Answer: 7)
10. **Say:** I used 4 sticks to make 1 square. I used 3 more sticks to make the second square.
11. **Ask:** Why do I only need 3 more sticks to make the second square? Raise your hand to answer. (Answer: The squares share a side)
12. **Ask:** How many squares are in the third pattern? Raise your hand to answer. (Answer: 3)
13. **Ask:** How many sticks? Count the sticks. Raise your hand to answer. (Answer: 10)
14. **Say:** I used 4 sticks to make 1 square. I used 7 sticks to make the second square. I used 10 sticks to make 3 squares. I want to find the pattern of how many sticks I add each time.
15. Tell pupils to turn to a partner and talk about how many sticks are added each time.
16. After a minute, invite 1 -2 pupils to share their ideas. (Answer: Add 3 sticks each time)
17. **Say:** The rule for the pattern is add 3 sticks each time. Let's use the rule to see if we can find out how many sticks are in the fourth pattern without counting.

18. **Say:** There are 10 sticks in the third pattern. I need to add 3. **Ask:** How many sticks are in the fourth pattern? Raise your hand to answer. (Answer: $10 + 3 = 13$)
19. **Ask:** How many sticks do I need to make a fifth pattern? Raise your hand to answer. (Answer: $13 + 3 = 16$ sticks)
20. Draw a fifth pattern and count the sticks to show there are 16 sticks. Count with pupils.
21. **Say:** Now I will write the rule. The rule is; 'Start with 4 sticks. Add 3 more sticks each time.'
22. Write the rule on the board.

Guided Practice (10 minutes)

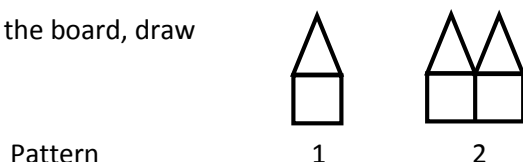
1. On the board, draw



2. **Ask:** How many triangles and sticks are in the first pattern. Raise your hand to answer. (Answer: 1 triangle, 3 sticks)
3. **Ask:** How many triangles and sticks are in the second pattern. Raise your hand to answer. (Answer: 2 triangles, 5 sticks)
4. Tell pupils to copy the pattern into their exercise books.
5. Tell pupils to make the next pattern. Tell them to add sticks to make 3 triangles. Tell pupils they may add the sticks to any side of the first 2 triangles.
6. Tell pupils to show their drawing to a partner. Pupils may see that that all the drawings do not look the same. **Ask** pupils to see if every drawing uses the same number of sticks to make 3 triangles. Raise your hand to answer. (Answer: Yes. Each drawing uses 7 sticks to make 3 triangles).
7. Tell pupils to continue the pattern to make 4 triangles, 5 triangles and 6 triangles.
8. **Ask:** How many sticks do you add each time to make the next triangle? Raise your hand to answer. (Answer: 2)
9. **Ask:** What is the rule for this pattern? Raise your hand to answer. (Answer: Start with 3 sticks. Add 2 more sticks each time.)
10. Write the rule on the board. Have pupils read it.

Independent Practice (10 minutes)

1. On the board, draw






2. Tell pupils to copy the pattern. Tell pupils to continue the pattern to make 5 houses.
3. Ask pupils to say the rule. (Answer: Start with 6 sticks. Add 5 more sticks each time.)

Closing (2 minutes)

1. **Ask:** What is the same about the rules for the squares, the triangles and the houses? (Example answer: You add 1 less stick than you start with.)
2. **Ask:** What do you think the rule is to make a stick pattern with rectangles? (Answer: Start with 4 sticks. Add 3 more sticks each time.)

Lesson Title: Using the 100-number Square to Find and Describe Number Patterns	Theme: Algebra	
Lesson Number: M-04-042	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the, lesson pupils will be able to use the 100-number square to find and describe number patterns.		Teaching Aids 100-number square (See below for printable 100 number square.)		Preparation Draw or copy a 100-number square on the board.
---	--	---	--	--	--

Opening (3 minutes)

1. Review number patterns.
2. **Say:** I will say a number. The class will say the number that is 10 more. If I say 2, the class says 12.
3. **Say:** 2 (Answer: 12), 12 (Answer: 22), 22 (Answer: 32), 32 (Answer: 42), 42 (Answer: 52)
4. **Say:** I will say a number. The class will say the number that is 10 less. If I say 13, the class says 3.
5. **Say:** 13 (Answer: 3), 25 (Answer: 15), 23 (Answer: 13), 46 (Answer: 36), 100 (Answer: 90)

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to learn how to find number patterns on a 100-number square.
2. Tell pupils to take out their exercise books.
3. **Say:** I am going to make a 100-number square on the board. You are going to make a 100-number square in your exercise books. Do not write until I tell you.
4. On the board write:

1 2 3 4 5 6 7 8 9 10

5. **Say:** I want you to write the numbers 1 -10 in a neat line in your exercise book. Put 2 fingers of space between each number.
6. Allow time for pupils to write 1 – 10.
7. **Say:** We are going to write the next numbers under the 10. We are going to count by 10 to write these numbers.
8. On the board write:

1	2	3	4	5	6	7	8	9	10
11				15					20
21				25					30
31				35					40
41				45					50
51				55					60
61				65					70
71				75					80
81				85					90
91				95					100

9. Allow pupils time to copy the numbers on the board. Remind them to write each number right under the number above it.

10. **Ask:** What is the number pattern going across the top row? Raise your hand to answer. (Answer: Count in 1's)
11. **Ask:** What are the number patterns going down? Raise your hand to answer. (Answer: Count in 10's)
12. **Ask:** Where do you see the number pattern for 'count in 5's'? Raise your hand to answer. (Answer: 5, 10, 15, 20 ...100.)
13. **Ask:** What number goes right under 2? Raise your hand to answer. (Answer: 12)
14. **Ask:** What number goes right before 90? Raise your hand to answer. (Answer: 89)
15. **Ask:** What number goes right after 55? Raise your hand to answer. (Answer: 56)

Guided Practice (10 minutes)

1. **Say:** Now you will complete the 100-number square on your own. Write the missing numbers.
2. Allow time for pupils to complete the 100-number square. (5 minutes)
3. As pupils are working, complete the 100-number square on the board.

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

Independent Practice (10 minutes)

1. Have pupils mark these patterns on the 100-number grid:
 - a) Count in 2's starting at 2. Circle all the numbers you count.
 - b) Count in 5's starting at 5. Put an x over all the numbers you count.
 - c) Count in 3's starting at 3. Put a square around all the numbers you count.
2. **Say:** You circled the numbers you count by 2. You put an x on the numbers you count by 5. What is 5×2 ? Raise your hand to answer. (Answer: 10)
3. **Ask:** What numbers did you both circle and x? Raise your hand to answer. (Answer: 10, 20, 30...100)
4. **Ask:** Why do you think those numbers have both a circle and an x? Raise your hand to answer. (Example answers: You can count to them in 5's and in 2's: $5 \times 2 = 10$; and those numbers count in 10's.)
5. Tell pupils to find the numbers that have both a circle and box around them.
6. Tell pupils to write a sentence about why they think '6' has a circle and box around it. (Example answers: You can count to 6 in 2's and in 3's: $2 \times 3 = 6$.)




Closing (2 minutes)

1. **Ask:** Why do you think '60' has a circle, x and box?
2. Tell pupils to turn to a partner and talk about their ideas.
3. Choose 1 -2 pupils to share their ideas with the class. (Example answers: You can count to 60 in 2's, 3's and 10's: $2 \times 3 = 6$, and $2 \times 3 \times 10 = 60$.)

Printable 100 number square:

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

Lesson Title: Using a Calendar to Find and Describe Number Patterns	Theme: Algebra	
Lesson Number: M-04-043	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to use a calendar to find and describe number patterns.		Teaching Aids Calendar		Preparation Find a calendar large enough for pupils to see the days and dates. If you cannot find a calendar, draw a large calendar on the board.
---	---	---	----------------------------------	--	---

Opening (3 minutes)

1. As a class, choral chant counting in 2's to 80. Have pupils put their finger on each number on their 100-number chart as they say it.
2. As a class, choral chant counting in 4's to 80. Have pupils put their finger on each number on their 100-number chart as they say it.
3. As a class, choral chant counting in 8's to 80. Have pupils put their finger on each number on their 100-number chart as they say it.
4. Ask pupils what patterns they notice. Invite a few pupils to share the patterns they notice. (Example answers: You touch fewer numbers when you count in 8's. You touch the most numbers when you count in 2's. When you count in 4's, you use every second number from counting in 2's. When you count in 8's, you use every second number from counting in 4's.)

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to learn how to find number patterns on a calendar.
2. **Say:** Look at the calendar on the board. Read the month and names of the days with pupils.

March						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			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	

3. **Ask:** What do the words on the calendar tell us? Raise your hand to answer. (Answer: The names of the month and days)
4. Show pupils how to read the calendar by day and date. Review how many days are in a week.
5. Read aloud together all the dates for Saturdays, starting with Saturday, March 4. Point at each date as you read it.
6. **Ask:** What is the first day and date of this month? Raise your hand to answer. (Answer: Wednesday, March 1)

7. **Ask:** What is the last day and date of this month? Raise your hand to answer. (Answer: Friday, March 31)
8. **Say:** I want to find the date of the second Tuesday.
9. Show pupils how to find the second Tuesday. Put your finger on Tuesday, March 7. Then, move your finger down to Tuesday, March 14. Tell pupils each action as you do it.
10. **Ask:** What do all the numbers under the word 'Sunday' mean? Raise your hand to answer. (Answer: The dates of the Sundays)
11. **Ask:** What is the date of the third Sunday? Raise your hand to answer. (Answer: March 19)

Guided Practice (10 minutes)

1. **Ask:** How many Tuesdays are there in March? Raise the correct number of fingers to show me the answer. Raise your hand to answer. (Answer: Pupils raise 4 fingers.)
2. **Ask:** How many Wednesdays are there in March? Raise the correct number of fingers to show me the answer. Raise your hand to answer. (Answer: Pupils raise 5 fingers.)
3. Repeat for each day of the week.
4. **Ask:** How many weekend days are there? Count the Saturdays and Sundays. Raise your hand to answer. (Answer: Pupils raise 8 fingers.)
5. Tell the pupils this story: Mrs Bah goes on holiday for a week. She leaves on March 8. What date does she come back?
6. Show pupils how to move down 1 week on the calendar.
7. **Ask:** What is the date? Raise your hand to answer. (Answer: Wednesday, March 15)
8. **Ask:** What is the number pattern for all the Wednesday dates? Raise your hand to answer. (Answer: Each date is 7 more)
9. Repeat for other days of the week.




Independent Practice (10 minutes)

1. Have pupils copy and complete in their exercise books:
 - a) The first Friday is March _____. (Answer: March 3)
 - b) The third Thursday is March _____. (Answer: March 16)
 - c) The fourth Monday is March _____. (Answer: March 24)
2. Pupils who finish early can copy and complete:
 - a) One week after Tuesday, March 21 is Tuesday, March _____. (Answer: March 28)
 - b) One week before Tuesday, March 21 is _____ day, March _____. (Answer: Tuesday, March 14)

Closing (2 minutes)

1. Ask pupils to check their answers with a partner.
2. Go over answers together as a class.

Lesson Title: Representing Number Patterns Visually	Theme: Algebra	
Lesson Number: M-04-044	Class/Level: Primary 4	Time: 35 minutes

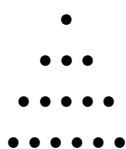
	Learning Outcomes By the end of the lesson, pupils will be able to represent number patterns visually (what could this pattern look like: 1, 3, 5,...).		Teaching Aids Drawing of patterns on the board.		Preparation Draw on the board 2 different patterns to show 1, 3, 5....
---	---	---	---	--	--

Opening (3 minutes)

1. As a class, choral chant counting in 3's to 90. Have pupils put their finger on each number on their 100-number chart as they say it.
2. As a class, choral chant counting in 6's to 90. Have pupils put their finger on each number on their 100-number chart as they say it.
3. As a class, choral chant counting in 9's to 90. Have pupils put their finger on each number on their 100-number chart as they say it.
4. Ask pupils what patterns they notice. Invite a few pupils to share their answer. (Example answers: You touch fewer numbers when you count in 9's. You touch the most numbers when you count in 3's. When you count in 6's, you use every second number from counting in 3's. When you count in 9's, you use every third number from counting in 3's.)

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to learn how to draw number patterns.
2. Show pupils the first pattern drawn on the board. Do not write numbers next to it.



3. Tell pupils to copy the pattern into their exercise books.
4. **Ask:** What comes next in this pattern? How many dots are in the next row? Raise your hand to answer. (Answer: 9)
5. Tell pupils to draw the next row of dots for the pattern in their exercise books.
6. Show pupils the second pattern drawn on the board. Tell pupils this is called an 'L pattern.'



7. **Ask:** How many dots will the next 'L' in the pattern have? Raise your hand to answer. (Answer: 9)

8. **Ask:** How do you draw the next 'L' in the pattern? Raise your hand to answer. (Answer: Draw a dot for the corner. Draw 4 dots next to it. Draw 4 dots above it.)
9. Choose pupils to come to the board and draw the next 3 shapes in the 'L' pattern.
10. **Ask:** What is the same about the 2 patterns? Raise your hand to answer. (Example answers: They both show the same pattern. They both add 2 each time. They both show 1, 3, 5, 7...etc.)
11. **Ask:** What is different about the 2 patterns? Raise your hand to answer. (Answer: They look different. You add dots in different ways for each pattern.)

Guided Practice (10 minutes)

1. Ask pupils to work with a partner to draw a pattern to show 1, 4, 7, 10...
2. Encourage pupils to think of ways to draw the pattern that are different from the triangle pattern or 'L' pattern.
3. Choose 3 or 4 pupils to come to the front of the class and draw their ideas on the board.
4. Ask pupils to say the rule for the pattern. Invite a few pupils to share their answer. (Answer: Start with 1. Add 3 more.)




Independent Practice (10 minutes)

1. Have pupils draw 2 different patterns in their exercise books to show '2, 5, 8, 11...'
2. Have pupils complete the next 3 shapes after '11' for their drawings.

Closing (2 minutes)

1. Ask pupils to tell a partner the rule for '2, 5, 8, 11...'
2. Go over the rule together as a class. Invite a few pupils to share their answer. (Answer: Start with 2. Add 3 more.)

Lesson Title: Finding and Describing Patterns out of Class	Theme: Algebra	
Lesson Number: M-04-045	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to find and describe patterns out of class.		Teaching Aids 1. Objects from out of the classroom with patterns. 2. Objects from out of the classroom with no patterns.		Preparation 1. Gather fabric, baskets, leaves and other objects from out of class with patterns. 2. Gather objects from out of class with no patterns.
---	---	---	---	--	---

Opening (3 minutes)

1. As a class, choral chant counting in 3's to 90. Count forward and backward.
2. As a class, choral chant counting in 30's to 900. Count forward and backward.
3. As a class, choral chant counting in 300's to 9000. Count forward and backward.

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to find and describe patterns we see out of class.
2. Place a piece of fabric with patterns on the wall or floor for pupils to see.
3. **Say:** Look at the fabric. Can you describe what is on the fabric?
4. Tell pupils to turn to a partner and tell in a few words what they see on the fabric.
5. **Ask:** The fabric has a pattern. Can anyone find and describe a pattern on the fabric?
6. Have pupils identify and talk about the pattern in partners.
7. Choose a pupil to come to the front of the class and describe the pattern. Tell the pupil to point to the pattern as he or she describes it.
8. **Ask:** What is a pattern? Raise your hand to answer. (Example answers: Something that follows a rule to get bigger. Something that repeats itself.)
9. **Ask:** Do the pictures on the fabric repeat or grow? Raise your hand to answer. (Answer: They repeat.)
10. **Ask:** Do you see it over and over in a certain order? What is the order? Raise your hand to answer. (Answers will depend upon the fabric.)
11. Show an object with a different pattern, such as different fabric or a basket. Repeat steps 2 – 10.

Guided Practice (10 minutes)

1. Show pupils the objects with patterns and without patterns.
2. Choose pupils to explain how they know which objects have patterns and which do not.
3. Teach the 'I Spy' game to help pupils find and describe patterns.
4. **Say:** We are going to play the 'I Spy' game. I am going to describe a pattern I see in the room. The class will try to guess the object in the room I am describing.
5. Find a pattern in the room and describe it.
6. For example, to describe striped material, you may Say: 'I spy something that is green-blue-white, green-blue-white, green-blue-white.'
7. Choose pupils to make a few guesses. Give more clues as necessary. (Answer: The answer matches the pattern described.)
8. Repeat several times.

9. **Say:** Look around the room for a pattern. When you see a pattern, raise your hand. I will call on you to describe the pattern. The class will try to guess the object in the room that you are describing.
10. Allow several pupils to find and describe patterns in the room.
11. Call on other pupils to guess the pattern.




Independent Practice (*10 minutes*)

1. Tell each pupil they will describe a pattern by writing about it.
2. Tell pupils to choose an object with a pattern to describe.
3. Have pupils draw the object and its pattern in their exercise books.
4. Have pupils write 1-2 sentences to describe the object and pattern. (Example answer: It is a necklace. The pattern is brown bead, black bead, red bead, brown bead, black bead, red bead.)

Closing (*2 minutes*)

1. Ask pupils to share their writing with a partner.
2. Choose 1 -2 pupils to share their patterns and sentences with the class.

Lesson Title: Finding the Missing Term in Number Patterns	Theme: Algebra	
Lesson Number: M-04-046	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to find the missing term in number patterns.		Teaching Aids None		Preparation Write the number patterns from the lesson on the board large enough for all pupils to see.
---	--	---	------------------------------	--	--

Opening (3 minutes)

1. As a class, choral chant counting in 8's to 80.
2. As a class, choral chant counting in 80's to 800.
3. As a class, choral chant counting in 800's to 8000.

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to find the missing term in number patterns.
2. Show pupils the number pattern '10, 18, 26, 34, 42 ...' on the board.
3. Have pupils read the numbers aloud.
4. **Ask:** Do we need to add or subtract to find this pattern?
5. Turn to a partner and talk about what you think. Give pupils 1 minute to talk.
6. **Say:** Raise 1 finger if you think we add. Raise 2 fingers if you think we subtract. (Answer: Add. Pupils should raise 1 finger.)
7. **Ask:** How do you know to add? Raise your hand to answer. (Answer: The numbers are getting bigger.)
8. **Say:** I know that $10 + 8 = 18$.
9. **Write** on the board:

$$\begin{array}{r}
 10, 18, 26, 34, 42 \dots \\
 \vee \\
 +8
 \end{array}$$

10. **Say:** I want to see if numbers. 'add 8' works for all the
11. **Ask:** What is $18 + 8$? Raise your hand to answer. (Answer: 26)
12. **Ask:** What is $26 + 8$? Raise your hand to answer. (Answer: 34)
13. **Ask:** What is $34 + 8$? Raise your hand to answer. (Answer: 42)
14. **Write** on the board:

$$\begin{array}{ccccccc}
 10, & 18, & 26, & 34, & 42 & \dots \\
 \vee & \vee & \vee & \vee & \\
 +8 & +8 & +8 & +8 &
 \end{array}$$

15. Tell pupils to turn to a partner and tell what the next number in the pattern is.
16. Choose pupils to come to the front of the class and write the next 3 terms in the pattern. (Answer: 50, 58, 66)
17. **Ask:** How do we find the next number in this pattern? Raise your hand to answer. (Answer: Add 8.)

18. **Say:** The rule for this pattern is 'Start with 10. Add 8.' Write the rule on the board. Read it with pupils.
19. Show pupils the number pattern '100, 95, 90, 85...'
20. **Ask:** Do we need to add or subtract to find this pattern?
21. Turn to a partner and talk about what you think. Give pupils 1 minute to talk.
22. **Say:** Raise 1 finger if you think we add. Raise 2 fingers if you think we subtract. (Answer: Subtract. Pupils should raise 2 fingers.)
23. **Ask:** How do you know to subtract? Raise your hand to answer. (Answer: The numbers are getting smaller.)

Guided Practice (10 minutes)

1. Tell pupils to copy '100, 95, 90, 85...' from the board into their exercise books.
2. Tell pupils to work in groups of 3 to talk about how to find the next 3 numbers in the pattern.
3. Guide pupil to write the pattern as '-5' under the numbers.
4. Have pupils write the next 3 terms in their exercise books.
5. Go over answer as a class. (Answer: 80, 75, 70)
6. **Write** on the board: '57, 62, 67, 72...'
7. Tell pupils to copy the pattern into the exercise books, find the next 3 terms in the pattern and write the rule for the pattern.




Independent Practice (10 minutes)

1. **Write** on the board (without answers):
 - a) 61, 55, 49, 43, ____, ____, ____ (Answer: 37, 31, 25. Subtract 6.)
 - b) 55, 66, 77, 88, ____, ____, ____ (Answer: 99, 110, 121. Add 11.)
 - c) 1007, 957, 907, 857, ____, ____, ____ (Answer: 807, 757, 707. Subtract 500)
2. Tell pupils to:
 - a) Copy the number patterns.
 - b) Find what you need to add or subtract and by how much.
 - c) Write the next 3 terms for each.
3. Tell pupils that they may create their own number pattern if they finish early.

Closing (2 minutes)

1. Go over answers with the class.
2. Have pupils check their work while you review the patterns and rules aloud.
3. **Say:** Good job today, pupils! You determined patterns and rules for patterns.

Lesson Title: Writing Rules for Number Patterns in Words	Theme: Algebra	
Lesson Number: M-04-047	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to write rules for number patterns in words.		Teaching Aids None		Preparation Write the number patterns from the lesson on the board large enough for all pupils to see.
---	--	---	------------------------------	--	--

Opening (3 minutes)

1. As a class, choral chant counting in 7's to 70.
2. As a class, choral chant counting in 70's to 700.
3. As a class, choral chant counting in 700's to 7000.

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to write rules for number patterns in words.
2. Show pupils the number pattern '1, 8, 15, 22...' on the board.
3. Have pupils read the numbers aloud.
4. **Ask:** Do we need to add or subtract to find this pattern?
5. Turn to a partner and talk about what you think. Give pupils 1 minute to talk.
6. **Say:** Raise 1 finger if you think we add. Raise 2 fingers if you think we subtract. (Answer: Add. Pupils should raise 1 finger.)
7. **Ask:** How do you know to add? Raise your hand to answer. (Answer: The numbers are getting bigger.)
8. **Say:** I know that $1 + 7 = 8$.
9. **Write** on the board:

$$\begin{array}{r} 1, 8, 15, 22... \\ \vee \\ +7 \end{array}$$

10. **Say:** I want to see if 'add 7' works for all the numbers.
11. **Ask:** What is $8 + 7$? Raise your hand to answer. (Answer: 15)
12. **Ask:** What is $15 + 7$? Raise your hand to answer. (Answer: 22)
13. **Write** on the board:

$$\begin{array}{r} 1, 8, 15, 22... \\ \vee \vee \vee \\ +7 +7 +7 \end{array}$$

14. Tell pupils to turn to a partner and tell what the next number in the pattern is.
15. **Say:** Now I need to write the rule for this number pattern. A rule has 2 parts. The first part of the rule tells what number to start with. The second part of the rule tells what number to add or subtract to get the next number.
16. **Ask:** What number does this pattern start with? Raise your hand to answer. (Answer: 1)
17. **Ask:** How do we find the next number in this pattern? Raise your hand to answer. (Answer: Add 7.)
18. Write on the board 'Rule: Start with 1. Add 7.' Read it aloud with pupils.

19. Show pupils the number pattern '10, 17, 24, 31...'
20. **Ask:** Do we need to add or subtract to find this pattern?
21. Turn to a partner and talk about what you think. Give pupils 1 minute to talk.
22. **Say:** Raise 1 finger if you think we add. Raise 2 fingers if you think we subtract. (Answer: Add. Pupils should raise 1 finger.)
23. **Ask:** How do you know to add? Raise your hand to answer. (Answer: The numbers are getting bigger.)

Guided Practice (10 minutes)

1. Tell pupils to copy '10, 17, 24, 31...' from the board into their exercise books.
2. Tell pupils to talk with a partner for 1 minute about how to find the next number in the pattern.
3. **Ask:** How do we find the next number? Raise your hand to answer. (Answer: Add 7.)
4. Write on the board 'Rule: _____. Add 7.'
5. **Ask:** What part of the rule is missing? Raise your hand to answer. (Answer: The number to start with)
6. Tell pupils to copy and complete the rule.
7. Have pupils check their answers with a partner. Raise your hand to answer. (Answer: Start with 10. Add 7.)
8. **Ask:** What is the same in the 2 rules? Raise your hand to answer. (Answer: They both add 7.)
9. **Ask:** What is different in the 2 rules? Raise your hand to answer. (Answer: They start with different numbers.)
10. Talk with the class about why it is important to write both parts of the rule for a pattern.




Independent Practice (10 minutes)

1. **Write** on the board (without answers):
 - a) 63, 56, 49, 42 (Answer: Start with 63. Subtract 7.)
 - b) 56, 64, 72, 80 (Answer: Start with 56. Add 8.)
2. Tell pupils to:
 - a) Copy the number patterns.
 - b) Write the rule.
3. Tell pupils that they may create their own number pattern if they finish early.

Closing (2 minutes)

1. Go over answers with the class.
2. Have pupils check their work as you review them with pupils aloud.
3. **Say:** Good job today, pupils! You found rules for number patterns using words.

Lesson Title: Multiplication Using the 7 and 8 Times Table	Theme: Everyday Arithmetic Multiplication	
Lesson Number: M-04-048	Class/Level: Primary 4	Time: 35 minutes

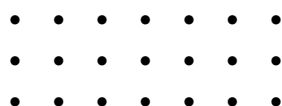
	Learning Outcomes By the end of the lesson, pupils will be able to solve multiplication problems by using the 7 and 8 times table (not long multiplication).		Teaching Aids 100-number chart		Preparation 1. Write on the board repeated addition problems from the lesson. 2. Draw on the board an array of 3 rows of 7 circles in each row. 3. Draw on the board an array of 7 rows with 3 circles in each row.
---	--	---	--	--	---

Opening (3 minutes)

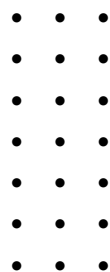
- Have pupils copy and complete repeated addition problems:
 - $2 + 2 + 2 =$ (Answer: 6)
 - $5 + 5 + 5 =$ (Answer: 15)
 - $4 + 4 + 4 =$ (Answer: 12)
- Invite pupils to come to the board and complete the problems.

Introduction to the New Material (10 minutes)

- Say:** Today we are going to multiply with 7 and 8.
- Show pupils the array on the board:



- Ask:** How many dots in each row? Raise your hand to answer. (Answer: 7)
- Ask:** How many rows? Raise your hand to answer. (Answer: 3)
- Ask:** What addition problem can we write to find out how many dots in all? Raise your hand to answer. (Answer: $7 + 7 + 7 = 21$)
- Write the addition problem on the board. Read it aloud with pupils.
- Ask:** What multiplication problem can we write to find out how many dots in all? Raise your hand to answer. (Answer: $3 \times 7 = 21$)
- Write the multiplication problem on the board. Read it aloud with pupils.
- Show pupils the array on the board:



- Ask:** How many dots in each row? Raise your hand to answer. (Answer: 3)
- Ask:** How many rows? Raise your hand to answer. (Answer: 7)
- Ask:** What addition problem can we write to find out how many dots in all? Raise your hand to answer. (Answer: $3 + 3 + 3 + 3 + 3 + 3 + 3 = 21$)

13. Write the addition problem on the board. Read it aloud with pupils.
14. **Ask:** What multiplication problem can we write to find out how many dots in all? Raise your hand to answer. (Answer: $7 \times 3 = 21$)
15. **Ask:** What is the same about the 2 multiplication problems? Raise your hand to answer. (Answer: We multiply 7 and 3 in both. The answer is 21 for both.)
16. **Ask:** What is different? Raise your hand to answer. (Answer: The order of the factors. The 3 comes first in one problem. The 7 comes first in the other problem.)
17. Review with pupils that the order of factors does not matter in multiplication. For example, pupils can use the 5 fact ' $5 \times 7 = 35$ ' to know ' $7 \times 5 = 35$.'

Guided Practice (10 minutes)

1. Ask pupils to find the 100-number chart they made in their exercise books in Lesson 42.
2. Tell pupils to underline the number 7.
3. As a class, count in 7's on the chart to 70. Tell pupils to underline each number as you count it.
4. **Ask:** What multiplication fact can we write about the first number you underlined when counting in 7's? Raise your hand to answer. (Answer: $7 \times 1 = 7$)
5. Have pupils write the multiplication fact in their exercise book.
6. **Ask:** What multiplication fact can we write about the second number you underlined when counting in 7's? Raise your hand to answer. (Answer: $7 \times 2 = 14$)
7. Have pupils write the multiplication fact in their exercise book.
8. Tell pupils to put a dot above the number 8.
9. As a class, count in 8's on the chart to 80. Tell pupils to put a dot above each number as you count it.
10. **Ask:** What multiplication fact can we write about the first number you put a dot above when counting in 8's? Raise your hand to answer. (Answer: $8 \times 1 = 8$)
11. Have pupils write the multiplication fact in their exercise book.
12. **Ask:** What multiplication fact can we write about the second number you underlined when counting in 8's? Raise your hand to answer. (Answer: $8 \times 2 = 16$)




Independent Practice (10 minutes)

1. Tell pupils to complete writing all of the multiplication facts for 7's and 8's. They may use their 100-number chart.
2. Tell pupils to write the facts again without looking at the 100-number chart.

Closing (2 minutes)

1. As a class, chorally chant the 7 facts, starting with $1 \times 7 = 7$. Chant all facts in order up to $10 \times 7 = 70$.
2. As a class, chorally chant the 7 facts, starting with $10 \times 7 = 70$. Chant all facts in backwards order down to $1 \times 7 = 7$.
3. Repeat steps 1 and 2 for 8 facts.
4. **Say:** Good job today, pupils! You learned how to complete your 7 and 8 multiplication facts!

Lesson Title: Multiplication Using the 9 and 10 Times Table	Theme: Everyday Arithmetic Multiplication	
Lesson Number: M-04-049	Class/Level: Primary 4	Time: 35 minutes

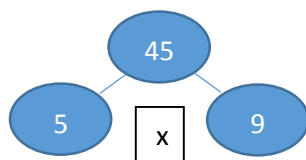
	Learning Outcomes: By the end of the lesson, pupils will be able to solve multiplication problems by using the 9 and 10 times table (not long multiplication).		Teaching Aids 1. Number circles 2. 100-number chart		Preparation 1. Write on the board the addition problems from the lesson. 2. Draw on the board 3 number circles.
---	--	---	--	--	--

Opening (3 minutes)

- Have pupils copy and complete the following addition problems:
 - $20 + 7 =$ (Answer: 27)
 - $30 + 6 =$ (Answer: 36)
 - $50 + 4 =$ (Answer: 54)
- Invite pupils to come to the board and complete the problems.

Introduction to the New Material (10 minutes)

- Say:** Today we are going to multiply with 9 and 10.
- Review with pupils that the order of factors in a multiplication problem does not change the answer. Show pupils the numbers in the circles below.



- Ask:** What two multiplication facts can we write with these numbers? Raise your hand to answer. (Answer: $5 \times 9 = 45$, $9 \times 5 = 45$)
- Write on the board the multiplication facts. Read them aloud with pupils.
- Repeat with other numbers in the circles to show ' $3 \times 9 = 27$, $9 \times 3 = 27$ ', ' $4 \times 9 = 36$, $9 \times 4 = 36$.'
- Write** on the board:
 - $10 \times 63 = 630$
- Ask:** What place value does the 3 have in 63? Raise your hand to answer. (Answer: 1's place)
- Ask:** What place value does the 6 have in 63? Raise your hand to answer. (Answer: 10's place)
- Ask:** What place value does the 3 have in 630? Raise your hand to answer. (Answer: 10's place)
- Ask:** What place value does the 6 have in 630? Raise your hand to answer. (Answer: 100's place)
- Ask:** What happens to the place value of each digit when we multiply by 10? Raise your hand to answer. (Answer: Each digit goes up 1 place value.)
- Write** on the board: $10 \times 63 = 630$ $10 \times 630 = 6300$ $10 \times 50 = 500$ $10 \times 500 = 5000$
- Ask:** What happens to a number when you multiply it by 10? Raise your hand to answer. (Answer: The digits move over 1 place value. You add a 0 to the end of the number to get the answer.)

Guided Practice (10 minutes)

1. Ask pupils to find the 100-number chart they made in their exercise books in Lesson 42.
2. Tell pupils to put a dot below the number 9.
3. As a class, count in 9's on the chart to 90. Tell pupils to put a dot under each number as you count it.
4. **Ask:** What multiplication fact can we write about the first number you put a dot under when counting in 9's? Raise your hand to answer. (Answer: $9 \times 1 = 9$)
5. Have pupils write the multiplication fact in their exercise book.
6. **Ask:** What multiplication fact can we write about the second number you underlined when counting in 9's? Raise your hand to answer. (Answer: $9 \times 2 = 18$)
7. Have pupils write the multiplication fact in their exercise book.




Independent Practice (10 minutes)

1. Tell pupils to complete writing all of the multiplication facts for 9's. They may use their 100-number chart.
2. Tell pupils to write the facts again without looking at the 100-number chart.
3. **Write** on the board (without answers).
 - a) $42 \times 10 =$ (Answer: 420)
 - b) $513 \times 10 =$ (Answer: 5130)
 - c) $109 \times 10 =$ (Answer: 1090)
4. Have pupils copy and solve.

Closing (2 minutes)

1. As a class, chorally chant the 9 facts, starting with $1 \times 9 = 9$. Chant all facts in order up to $10 \times 9 = 90$.
2. As a class, chorally chant the 9 facts, starting with $10 \times 9 = 90$. Chant all facts in backwards order down to $1 \times 9 = 9$.
3. Review 7 and 8 facts as time permits.
4. **Say:** Good job today, pupils! You learned your 9 and 10 multiplication facts.

Lesson Title: Long Multiplication (2-Digit by 1-Digit Number) without Renaming	Theme: Everyday Arithmetic Multiplication	
Lesson Number: M-04-050	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to multiply 2-digit numbers by 1-digit numbers using long multiplication, without renaming.		Teaching Aids None		Preparation Write the 3 steps to solve a 2-digit by 1-digit multiplication problem on the board.
---	---	---	------------------------------	---	--

Opening (3 minutes)

1. Review multiplication facts. As a class, chant the facts aloud.
2. Begin with 2×1 up to 2×9 . Repeat for 3 facts, 4 facts, 5 facts, 6 facts, 7 facts, 8 facts and 9 facts.

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to learn to multiply 2-digit numbers by 1-digit numbers using long multiplication.
2. **Write** on the board ' $43 \times 2 = \underline{\quad}$ '. Read aloud with pupils.
3. **Say:** We can write 43×2 vertically to show place value.
4. **Write** on the board:

Tens	Ones
4	3
x	2

5. **Ask:** What digits are in the 1's place? Raise your hand to answer. (Answer: 3 and 2)
6. **Ask:** What digit is in the 10's place? Raise your hand to answer. (Answer: 4)
7. Read with pupils the 3 steps to solve a 2-digit by 1-digit multiplication problem.
 - a) Step 1: Use the bottom number to multiply. This is usually the smaller number or 1-digit number.
 - b) Step 2: Multiply the ones place.
 - c) Step 3: Multiply the tens place.
8. Show pupils how to use the steps to solve 43×2 .

Tens	Ones
4	3
x	2
86	

9. **Write** on the board:

Tens	Ones
3	2
x	3

10. Tell pupils to copy it into their exercise books. Remind pupils to line up the digits by place value.

11. Solve the problem step by step on the board. Read each step from the board with pupils as you use it to solve the problem.

Tens	Ones
3	2
x	3
96	

12. Have pupils use the steps to solve the problem in their exercise books.

Guided Practice (10 minutes)

1. **Write** on the board (without answers).
 - a) 21×4 (Answer: 84)
 - b) 32×2 (Answer: 64)
 - c) 34×2 (Answer: 68)
2. Have pupils write these multiplication problems vertically in their exercise books. Remind pupils to line up the digits by place value.
3. Ask pupils to check their work with a partner to ensure the numbers are lined up correctly.
4. Guide pupils to solve the first problem. Have pupils read each step aloud from the board. Then, have pupils carry out each step.
5. Have pupils solve the next 2 problems.




Independent Practice (10 minutes)

1. **Write** on the board (without answers).
 - a) 33×3 (Answer: 99)
 - b) 23×3 (Answer: 69)
 - c) 22×3 (Answer: 66)
 - d) 31×3 (Answer: 93)
2. Have pupils write these multiplication problems vertically in their exercise books and solve.

Closing (2 minutes)

1. Have pupils check with a partner to ensure their numbers are lined up by place value.
2. Go over answers with the class.
3. **Say:** Good job today, pupils! You multiplied 2- digit by 1- digit numbers!

Lesson Title: Long Multiplication (2-Digit by 1-Digit Numbers) with Renaming	Theme: Everyday Arithmetic Long Multiplication	
Lesson Number: M-04-051	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to multiply 2-digit numbers by 1-digit numbers using long multiplication, with renaming.		Teaching Aids None		Preparation 1. Write the steps to solve a 2-digit by 1-digit multiplication problem on the board. 2. Draw a place value table for tens and ones on the board.
---	--	---	------------------------------	--	--

Opening (3 minutes)

1. Review multiplication facts. As a class, chant the facts aloud.
2. Begin with 2×9 down to 2×1 . Repeat for 3 facts, 4 facts, 5 facts, 6 facts, 7 facts, 8 facts and 9 facts as time permits.

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to learn to multiply 2-digit numbers by 1-digit numbers. We will learn how to rename in multiplication.

2. **Write** on the board:

Tens	Ones
4	6
x	2

3. Read the problem aloud with pupils.
4. Review the 3 steps to solve a 2-digit by 1-digit multiplication problem.
5. Read aloud with pupils:
 - a) Step 1: Use the bottom number to multiply. This is usually the smaller number. In this case, the 1- digit number.
 - b) Step 2: Multiply the ones place.
 - c) Step 3: Multiply the tens place.
6. **Ask:** What digits are in the ones place? Raise your hand to answer. (Answer: 6 and 2)
7. **Ask:** What digit is in the tens place? Raise your hand to answer. (Answer: 4)
8. **Ask:** What numbers do I multiply first? Raise your hand to answer. (Answer: Multiply 6×2)
9. **Say:** $6 \times 2 = 12$. 12 is a 2-digit number. It is the same as $10 + 2$.
10. **Say:** I cannot write 12 in the ones place in the answer space. I can only write the '2' from 12 there. I need to carry over the '1' into the tens place because the 1 represents 10. I write it above the '4' in the tens place

Tens	Ones
1	
4	6
x	2
	2

11. **Say:** Next I multiply the 4 in the tens place by 2 and get $4 \times 2 = 8$. I add the '1' I carried over into the tens place to the '8' and get $8 + 1 = 9$.

Tens	Ones
1	
4	6
x	2
9 2	

12. **Write** on the board:

Tens	Ones
2	7
x	3

13. Tell pupils to copy it into their exercise books. Remind pupils to line up the digits by place value.

14. Solve the problem step by step on the board. Say each step as you do it.

Tens	Ones
2	
2	7
x	3
8 1	

15. Have pupils solve the problem in their exercise books.

Guided Practice (10 minutes)

1. **Write** on the board (without answers).
 - a) 23×4 (Answer: 92)
 - b) 28×3 (Answer: 84)
 - c) 18×5 (Answer: 90)
 - d) 13×6 (Answer: 78)
2. Have pupils write these multiplication problems vertically in their exercise books. Remind pupils to line up the digits by place value.
3. Ask pupils to check their work with a partner to ensure the numbers are lined up correctly.
4. Guide pupils to solve the first problem. Have pupils read each step aloud from the board. Then, have pupils carry out each step.
5. Have pupils solve the next 3 problems.




Independent Practice (10 minutes)

1. **Write** on the board (without answers):
 - a) 14×7 (Answer: 98)
 - b) 16×6 (Answer: 96)
 - c) 19×4 (Answer: 76)
 - d) 47×2 (Answer: 94)
2. Have pupils write these multiplication problems vertically in their exercise books and solve.

Closing (2 minutes)

1. Have pupils check with a partner to ensure their numbers are lined up by place value.
2. Go over answers with the class.

Lesson Title: Long Multiplication (3-Digit by 1-Digit Numbers) without and with Renaming	Theme: Everyday Arithmetic - Long Multiplication	
Lesson Number: M-04-052	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to multiply 3-digit numbers by 1-digit numbers using long multiplication with and without renaming		Teaching Aids None		Preparation Write the multiplication problems from the lesson on the board vertically.
---	--	---	------------------------------	--	--

Opening (3 minutes)

1. Review multiplication facts. As a class, chant the facts aloud.
2. Begin with 9×1 up to 9×9 . Repeat for 8 facts, 7 facts, 6 facts, 5 facts, 4 facts, 3 facts and 2 facts as time permits.

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to learn how to multiply 3-digit numbers by 1-digit numbers using long multiplication, with and without renaming.
2. **Write** on the board:

$$\begin{array}{r|l} 3 & 7 & 8 \\ \times & & 2 \\ \hline \end{array}$$

3. Read the problem aloud with pupils.
4. Ask pupils to name the digits in each place value.
5. **Ask:** What numbers do I multiply first? Raise your hand to answer. (Answer: Multiply 8×2)
6. **Ask:** What is 8×2 ? Raise your hand to answer. (Answer: 16)
7. **Say:** 16 is a 2-digit number. I can only write the '6' in the answer space. I need to carry over the '1' into the tens place because it represents 10 so I put it above the tens place. I write it above the '7' in the tens place.

$$\begin{array}{r|l} & 1 & \\ 3 & 7 & 8 \\ \times & & 2 \\ \hline & & 6 \end{array}$$

8. **Say:** Next I need to multiply the digit in the tens place by 2. What numbers do I multiply next? Raise your hand to answer. (Answer: Multiply 7×2)
9. **Say:** $7 \times 2 = 14$. I need to add the '1' I carried over into the tens place to the '14': $14 + 1 = 15$. I write the '5' from the 15 in the answer space. I carry over the '1' from 15 into the hundreds place because it represents 100 so I put it above the hundreds place. I write the '1' above the '3'.

$$\begin{array}{r|l} & 1 & 1 & \\ 3 & 7 & 8 \\ \times & & 2 \\ \hline & 5 & 6 \end{array}$$

10. **Say:** Next I need to multiply the digit in the hundreds place by 2. What numbers do I multiply next? Raise your hand to answer. (Answer: Multiply 3 x 2)
11. **Say:** $3 \times 2 = 6$. I need to add the '1' I carried over into the hundreds place to the '6': $6 + 1 = 7$.

$$\begin{array}{r|l}
 1 & 1 \\
 3 & 7 & 8 \\
 \times & & 2 \\
 \hline
 & 7 & 5 & 6
 \end{array}$$

12. Read the multiplication problem and answer aloud with pupils.
13. **Write** on the board:

$$\begin{array}{r}
 321 \\
 \times 3 \\
 \hline
 \end{array}$$

14. Show pupils how to solve it step by step. Multiply the ones place by 3. Multiply the tens place by 3. Multiply the hundreds place by 3.

$$\begin{array}{r}
 321 \\
 \times 3 \\
 \hline
 963
 \end{array}$$

15. **Ask:** Did we have to carry over any numbers in this problem? Point your thumb up if we did carry over numbers. Point your thumb down if we did not carry over numbers. (Answer: Pupils should point their thumbs down. No numbers were carried over.)

Guided Practice (10 minutes)

- Write** on the board:
 - 254×3 (Answer: 762)
 - 117×6 (Answer: 702)
- Have pupils write these multiplication problems vertically in their exercise books. Remind pupils to line up the digits by place value.
- Guide pupils to solve the problems step by step.
- After solving each problem, read the multiplication problem and answer aloud with pupils.




Independent Practice (10 minutes)

- Write** on the board:
 - 126×5
 - 431×2
 - 114×4
- Have pupils write these multiplication problems vertically in their exercise books. Remind pupils to line up the digits by place value and work individually.

Closing (2 minutes)

- Go over answers with the class. (Answers: $126 \times 5 = 630$, $431 \times 2 = 862$, $114 \times 4 = 456$)

Lesson Title: Long Multiplication (3-Digit by 2-Digit Numbers) without Renaming	Theme: Everyday Arithmetic Long Multiplication
Lesson Number: M-04-053	Class/Level: Primary 4 Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to multiply 3-digit numbers by 2-digit numbers using long multiplication without renaming.		Teaching Aids None		Preparation Write the long multiplication problems from the lesson on the board.
---	--	---	------------------------------	--	--

Opening (3 minutes)

1. Review multiplication facts. Ask pupils to write all the 7 multiplication facts and their answers.
2. Have pupils check their work with a partner.

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to learn how to multiply 3-digit numbers by 2-digit numbers using long multiplication.
2. **Write** on the board:

$$\begin{array}{r|l} 3 & 2 & 4 \\ \times & 1 & 2 \\ \hline \end{array}$$

3. Read the problem aloud with pupils.
4. Ask pupils to name the digits in each place value.
5. **Ask:** How is this multiplication problem different from the other problems we learned this week? Raise your hand to answer. (Answer: The bottom number has 2-digits.)
6. **Say:** 12 is a 2-digit number. First, I will multiply all the digits in '324' by the '2' in '12'. Then, I will multiply all the digits in 324 by the '1' in 12.

$$\begin{array}{r|l} 3 & 2 & 4 \\ \times & 1 & 2 \\ \hline 6 & 4 & 8 \end{array}$$

7. **Say:** First I multiply the digits in 324 by 2: $4 \times 2 = 8$. I write 8 in the ones place. Next, I multiply the 2 in the tens place by 2: $2 \times 2 = 4$. I write 4 in the tens place. Last I multiply the 3 in the hundreds place by 2: $3 \times 2 = 6$. I write 6 in the hundreds place.
8. **Ask:** What do I need to do next to solve the problem? Raise your hand to answer (Answer: Multiply all the digits by the '1' in 12).
9. **Say:** The '1' in 12 is in the tens place. I will need to start my answer for it in the tens place. I will write a '0' in the ones place to remind me.

$$\begin{array}{r|l} 3 & 2 & 4 \\ \times & 1 & 2 \\ \hline 6 & 4 & 8 \\ \hline & & 0 \end{array}$$

10. **Say:** Now I need to multiply each digit in the number '324' by the '1' in 12. I will write my answer underneath.

$$\begin{array}{r}
 \begin{array}{|c|c|c|}
 \hline
 3 & 2 & 4 \\
 \hline
 \times & 1 & 2 \\
 \hline
 \end{array} \\
 + \quad 6 \quad 4 \quad 8 \\
 \hline
 3 \quad 2 \quad 4 \quad 0 \\
 \hline
 \end{array}$$

11. **Say:** Now I need to add the answers together. I start in the ones place and add '8 + 0 = 8.' Then, I add the answers in the tens place. Then, I add the answers in the hundreds place. Then, I bring down the 3 in the thousands place.

$$\begin{array}{r}
 \begin{array}{|c|c|c|}
 \hline
 3 & 2 & 4 \\
 \hline
 \times & 1 & 2 \\
 \hline
 \end{array} \\
 + \quad 6 \quad 4 \quad 8 \\
 \hline
 3 \quad 2 \quad 4 \quad 0 \\
 \hline
 3 \quad 8 \quad 8 \quad 8 \\
 \hline
 \end{array}$$

Guided Practice (10 minutes)

1. **Write** on the board:

$$\begin{array}{r}
 904 \quad 123 \\
 \times 11 \quad \times 32 \\
 \hline
 \end{array}$$

- Have pupils write these multiplication problems vertically in their exercise books. Remind pupils to line up the digits by place value.
- Ask pupils to check their work with a partner to ensure the numbers are lined up correctly.
- Guide pupils to solve the problems step by step.
- After solving each problem, read the multiplication problem and answer aloud with pupils. (Answers: $904 \times 11 = 9944$, $123 \times 32 = 3936$)

Independent Practice (10 minutes)

1. **Write** on the board:




$$\begin{array}{r}
 126 \quad 401 \quad 114 \\
 \times 11 \quad \times 12 \quad \times 22 \\
 \hline
 \end{array}$$

2. Have pupils copy these into their exercise books and solve.

Closing (2 minutes)

- Go over answers with the class. (Answers: $126 \times 11 = 1386$, $401 \times 12 = 4812$, $114 \times 22 = 2508$)
- Say:** Good job today, pupils! You multiplied 3- digit by 2- digit numbers!

Lesson Title: Long Multiplication (3-Digit by 1-Digit Numbers) with Renaming	Theme: Everyday Arithmetic Long Multiplication	
Lesson Number: M-04-054	Class/Level: Primary 4	Time: 35 minutes

	<p>Learning Outcomes By the end of the lesson, pupils will be able to multiply 3-digit numbers by 1-digit numbers using long multiplication with renaming.</p>		<p>Teaching Aids None</p>		<p>Preparation Write the long multiplication problems from the lesson on the board.</p>
---	---	---	--------------------------------------	--	--

Opening (3 minutes)

1. Review multiplication facts. Ask pupils to write all the 8 multiplication facts and their answers.
2. Have pupils check their work with a partner.

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to review multiplying 3-digit numbers by 1-digit numbers using long multiplication, with renaming.

2. **Write** on the board:

$$\begin{array}{r|l} 573 \\ \times 4 \\ \hline \end{array}$$

3. Read the problem aloud with pupils.
4. Ask pupils to name the digits in each place value.
5. **Ask:** What numbers do I multiply first? Raise your hand to answer. (Answer: Multiply 3 x 4.)
6. **Ask:** What is 3 x 4? Raise your hand to answer. (Answer: 12)
7. **Say:** 12 is a 2-digit number. I can only write the '2' in the ones place.
8. **Ask:** What do I do with the '1'? Raise your hand to answer. (Answer: Write it above the '7' in the tens place.)

$$\begin{array}{r|l} 2 & 573 \\ \times & 4 \\ \hline & 2 \end{array}$$

9. **Say:** Next I need to multiply the digit in the tens place by 4. What numbers do I multiply next? Raise your hand to answer. (Answer: Multiply 7 x 4.)
10. **Say:** 7 x 4 = 28. I need to add the '1' I carried over into the tens place to the '28': 28 + 1 = 29.
11. **Ask:** Where do I write the '9' from the '29'? Raise your hand to answer. (Answer: Write the '9' from the 29 in the answer space.)
12. **Ask:** What do I do with the '2' from the '29'? Raise your hand to answer. (Answer: Write it above the '5' in the hundreds place.)

$$\begin{array}{r|l} 2 & 573 \\ \times & 4 \\ \hline \end{array}$$

$$\begin{array}{r|l} & 4 \\ \hline & 92 \end{array}$$

13. **Say:** Next I need to multiply the digit in the hundreds place by 4. What numbers do I multiply next? Raise your hand to answer. (Answer: Multiply 5 x 4.)
14. **Say:** 5 x 4 = 20. I need to add the '2' I carried over into the hundreds place to the '20': 20 + 2 = 22.

$$\begin{array}{r|l} 2 & 1 & 3 \\ \hline 5 & 7 & 4 \\ \times & & \\ \hline 2 & 2 & 9 & 2 \end{array}$$

15. Read the multiplication problem and answer aloud with pupils.

Guided Practice (10 minutes)

1. **Write** on the board:

$$\begin{array}{r} 654 \\ \times 3 \\ \hline \end{array} \quad \begin{array}{r} 817 \\ \times 6 \\ \hline \end{array}$$

2. Have pupils write these multiplication problems vertically in their exercise books. Remind pupils to line up the digits by place value.
3. Guide pupils to solve the problems step by step.
4. After solving each problem, read the multiplication problem and answer aloud with pupils. (Answers: 654 x 3 = 1962, 817 x 6 = 4902)

Independent Practice (10 minutes)

1. **Write** on the board:




$$\begin{array}{r} 326 \\ \times 5 \\ \hline \end{array} \quad \begin{array}{r} 431 \\ \times 7 \\ \hline \end{array} \quad \begin{array}{r} 184 \\ \times 9 \\ \hline \end{array}$$

2. Have pupils copy these into their exercise books and solve them individually.

Closing (2 minutes)

1. Go over answers with the class. (Answers: 326 x 5 = 1630, 431 x 7 = 3017, 184 x 9 = 1656)
2. **Say:** Good job today, pupils! You solved multiplication with renaming for 3-digit by 1-digit numbers!

Lesson Title: Long Multiplication (4-Digit by 1-Digit Numbers) without and with Renaming	Theme: Everyday Arithmetic Long Multiplication
Lesson Number: M-04-055	Class/Level: Primary 4 Time: 35 minutes

 Learning Outcomes: By the end of the lesson, pupils will be able to multiply 4-digit numbers by 1-digit numbers using long multiplication with and without renaming	 Teaching Aids None	 Preparation Write the long multiplication problems from the lesson on the board.
---	--	--

Opening (3 minutes)

1. Revise multiplication facts. Ask pupils to write all the 6 multiplication facts and their answers.
2. Have pupils check their work with a partner.

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to learn to multiply 4-digit numbers by 1-digit numbers using long multiplication, with and without renaming.
2. **Write** on the board:

$$\begin{array}{r} 4 \mid 8 \mid 6 \mid 1 \\ \times \quad \quad \quad 2 \\ \hline \end{array}$$

3. Read the problem aloud with pupils.
4. Ask pupils to name the digits in each place value.
5. **Ask:** What numbers do I multiply first? Raise your hand to answer. (Answer: Multiply 1 x 2.)
6. **Ask:** What is 1 x 2? Raise your hand to answer. (Answer: 2)
7. **Say:** I write '2' in the answer space.

$$\begin{array}{r} 4 \mid 8 \mid 6 \mid 1 \\ \times \quad \quad \quad 2 \\ \hline \quad \quad \quad 2 \end{array}$$

8. **Ask:** What do I multiply next? Raise your hand to answer. (Answer: Multiply the 6 in the tens place by 2)
9. **Say:** $6 \times 2 = 12$. 12 is a 2-digit number. I can only write the '2' in the answer space. I need to carry over the '1' into the hundreds place. I write it above the '8' in the hundreds place.

$$\begin{array}{r} \quad 1 \\ 4 \mid 8 \mid 6 \mid 1 \\ \times \quad \quad \quad 2 \\ \hline \quad 2 \mid 2 \end{array}$$

10. **Say:** Next I need to multiply the digit in the hundreds place by 2. What numbers do I multiply next? Raise your hand to answer. (Answer: Multiply 8 x 2.)

11. **Say:** $8 \times 2 = 16$. I need to add the '1' I carried over into the hundreds place to the '16': $16 + 1 = 17$. I write the '7' in the answer space. I write the '1' in the thousands place above the '4'.

$$\begin{array}{r} 1 \quad 1 \\ 4 \mid 8 \mid 6 \mid 1 \\ \times \quad \quad \quad 2 \\ \hline 7 \quad 2 \quad 2 \end{array}$$

12. **Say:** Next I need to multiply the digit in the thousands place by 2. What numbers do I multiply next? Raise your hand to answer. (Answer: Multiply 4×2 .)
13. **Say:** $4 \times 2 = 8$. I need to add the '1' I carried over into the hundreds place to the '8': $8 + 1 = 9$.

$$\begin{array}{r} 1 \quad 1 \\ 4 \mid 8 \mid 6 \mid 1 \\ \times \quad \quad \quad 2 \\ \hline 9 \quad 7 \quad 2 \quad 2 \end{array}$$

14. Read the multiplication problem and answer aloud with pupils.
15. **Ask:** Did we have to carry over for all the numbers in this problem? Point your thumb up if we did carry over all numbers. Point your thumb down if we did not carry over all numbers. (Answer: Pupils should point their thumbs down. Not all numbers were carried over.)
16. **Say:** We only carry over numbers if our answer has 2 digits.

Guided Practice (10 minutes)

- Write** on the board:

$$\begin{array}{r} 2541 \quad 1512 \\ \times 3 \quad \quad \times 6 \end{array}$$
- Have pupils write these multiplication problems vertically in their exercise books. Remind pupils to line up the digits by place value.
- Guide pupils to solve the problems step by step.
- After solving each problem, read the multiplication problem and answer aloud with pupils. (Answers: $2541 \times 3 = 7623$, $1512 \times 6 = 9072$)

Independent Practice (10 minutes)




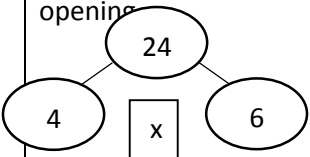
- Write** on the board:

$$\begin{array}{r} 1624 \quad 3431 \quad 2169 \\ \times 5 \quad \quad \times 2 \quad \quad \times 4 \end{array}$$
- Have pupils copy these into their exercise books and solve them individually.

Closing (2 minutes)

- Go over answers with the class. (Answers: $1624 \times 5 = 8120$, $3431 \times 2 = 6862$, $2169 \times 4 = 8676$)
- Say:** Good job today, pupils! You solved many 4-digit by 1-digit multiplication problems!

Lesson Title: Division of 2-Digit Whole Number by 1-Digit Number without a Remainder Using Long Division	Theme: Everyday Arithmetic Long Division	
Lesson Number: M-04-056	Class/Level: Primary 4	Time: 35 minutes

 <p>Learning Outcomes: By the end of the lesson, pupils will be able to divide a 2-digit whole number by a 1-digit number without a remainder using long division.</p>	 <p>Teaching Aids None</p>	 <p>Preparation Write on the board number circles for the opening</p> <div style="text-align: center;">  </div>
--	--	--

Opening (3 minutes)

1. Review how to use multiplication facts to solve division facts. Remind pupils that multiplication and division are the opposite of each other.
2. Read the number circles with pupils.
3. Invite a four pupils to give the 2 multiplication facts and the 2 division facts that can be made with the numbers. Raise your hand to answer. (Answers: $4 \times 6 = 24$, $6 \times 4 = 24$; $24 \div 4 = 6$, $24 \div 6 = 4$)

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to learn how to divide 2-digit numbers by 1-digit numbers using long division.
2. **Write** on the board '96 ÷ 3'. Read aloud with pupils '96 divided by 3'.
3. **Say:** We can write division problems a different way, called 'long division'.
4. **Write** on the board:

$$3 \overline{) 96}$$

5. **Say:** We also read this problem '96 divided by 3'.
6. Tell pupils to copy the problem.
7. Read the problem with pupils.
 - Tell pupils to touch the '96' and say '96'.
 - Tell pupils to trace the division line with their pointer finger and say 'divided by'.
 - Tell pupils to touch the '3' and say '3'.
8. **Say:** We start with the tens digit in long division.
9. **Ask:** What is the tens digit in 96? Raise your hand to answer. (Answer: 9)
10. **Say:** $9 \div 3 = 3$. I can write the '3' in the answer space above the '9' because 9 divided by 3 gives me 3.

$$3 \overline{) 96} \quad 3$$

11. Tell pupils to write a '3' in the answer space above 9. Tell pupils it is very important to line up the place values.
12. **Say:** Next we divide the digit in the ones place.
13. **Ask:** What is the digit in the ones place? Raise your hand to answer. (Answer: 6)
14. **Say:** $6 \div 3 = 2$. I can write the 2 in the answer space above 6.

$$\begin{array}{r} 3 \ 2 \\ 3 \overline{) 9 \ 6} \end{array}$$

15. Read the division problem and answer aloud with pupils '96 divided by 3 equals 32'.
16. **Write** on the board:

$$3 \overline{) 7 \ 8}$$

17. Read the problem with pupils '78 divided by 3'.
18. **Say:** We start with the tens digit in long division. I need to divide the 7 in the tens place by 3.
19. **Say:** I don't know what 7 divided by 3 is. I must use the closest number I can that is less than the '7'. The closest number I can use is 6 because I know $6 \div 3 = 2$. I write 2 above the 7. I write 6 below the 7 because I multiplied 2×3 to get 6.

$$\begin{array}{r} 2 \\ 3 \overline{) 7 \ 8} \\ \underline{6} \end{array}$$

20. **Say:** I used $6 \div 3$, not $7 \div 3$. I need to show the difference between 7 and 6. I need to subtract 7 - 6.

$$\begin{array}{r} 2 \\ 3 \overline{) 7 \ 8} \\ \underline{- 6} \\ 1 \end{array}$$

21. **Say:** I need to use the '1' that shows the difference between the '7' and the '6'. It is in the tens place. The 8 is in the ones place. I can put them together to make 18. I circle 18 to remember to use it to divide. $18 \div 3 = 6$.

$$\begin{array}{r} 2 \ 6 \\ 3 \overline{) 7 \ 8} \\ \underline{- 6} \\ \textcircled{1 \ 8} \end{array}$$

22. Read the division problem and answer aloud with pupils.

Guided Practice (10 minutes)

1. **Write** on the board: $6 \overline{) 96}$ $4 \overline{) 64}$ $5 \overline{) 85}$ $3 \overline{) 57}$
2. Have pupils copy these problems into their exercise books.
3. Guide pupils to solve the first 2 problems step by step.

4. Read the problems and answers aloud with pupils. (Answers: $96 \div 6 = 16$, $64 \div 4 = 16$)




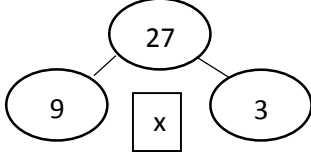
Independent Practice (10 minutes)

1. Have pupils complete the last 2 problems on their own.
2. **Write** the following problems on the board:
 - a) $72 \div 6$
 - b) $85 \div 5$
3. **Say:** Copy these extra two problems into your notebook and solve them individually.

Closing (2 minutes)

1. Go over answers with the class. (Answers: $85 \div 5 = 17$; $57 \div 3 = 19$; $72 \div 6 = 12$; $85 \div 5 = 17$)
2. **Say:** Good job today, pupils! You divided many problems using long division.

Lesson Title: Division of 2-Digit Whole Number by 1-Digit Number with Remainder Using Long Division	Theme: Everyday Arithmetic Long Division	
Lesson Number: M-04-057	Class/Level: Primary 4	Time: 35 minutes

 <p>Learning Outcomes: By the end of the lesson, pupils will be able to divide a 2-digit whole number by a 1-digit number with a remainder using long division.</p>	 <p>Teaching Aids None</p>	 <p>Preparation Write the number circles for the opening on the board.</p> <div style="text-align: center;">  </div>
---	--	--

Opening (3 minutes)

1. Review how to use multiplication facts to solve division facts. Remind pupils that multiplication and division are the opposite of one another.
2. Read the number circles with pupils.
3. Invite four pupils to give the 2 multiplication facts and the 2 division facts that can be made with the numbers. (Answers: $9 \times 3 = 27$, $3 \times 9 = 27$, $27 \div 9 = 3$, $27 \div 3 = 9$)

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to learn to divide 2-digit numbers by 1-digit numbers using long division. We will have remainders. Remainders are when numbers are still left over after we finish dividing because they do not divide exactly.
2. **Say:** I want to put 86 oranges into 3 boxes. I want to put the same number of oranges in each box.
3. **Write** on the board:

$$3 \overline{) 86}$$

4. **Say:** We start with the tens digit in long division.
5. **Ask:** What is the tens digit in 86? Raise your hand to answer. (Answer: 8)
6. **Say:** I don't know what 8 divided by 3 is. I will use the closest number that I can less than 8. The closest number I can use is 6. I know $6 \div 3 = 2$. I will write 2 above the 8. I will write 6 below the 8.

$$\begin{array}{r} 2 \\ 3 \overline{) 86} \\ \underline{6} \end{array}$$

7. **Say:** Next I subtract $8 - 6 = 2$. The 2 means 2 tens. I can add it to 6 to make 26.

$$\begin{array}{r} 2 \\ 3 \overline{) 86} \\ \underline{-6} \quad \downarrow \\ \underline{26} \end{array}$$

8. **Say:** Next we divide 26 by 3.
9. **Say:** I don't know what 26 divided by 3 is. I will use the closest number that I can less than 26. The closest number I can use is 24 because I know $24 \div 3 = 8$. I write 8 above the 6. I write 24 below 26 because 8×3 is 24.

$$\begin{array}{r} 28 \\ 3 \overline{) 86} \\ \underline{-6} \\ 26 \\ \underline{24} \\ 2 \end{array}$$

10. **Say:** I used $24 \div 3$, not $26 \div 3$. I need to show the difference between 26 and 24. I need to subtract $26 - 24$. I have used up my answer spaces. The 2 is a remainder. I write 'R 2' next to my answer.

$$\begin{array}{r} 28 \text{ R } 2 \\ 3 \overline{) 86} \\ \underline{-6} \\ 26 \\ \underline{24} \\ 2 \end{array}$$

11. **Say:** I can put 86 oranges into 3 boxes. There are 28 oranges in each box and I will have 2 left over. The 2 is the remainder.

Guided Practice (10 minutes)

1. **Write** on the board: $6 \overline{) 99}$ $4 \overline{) 65}$ $5 \overline{) 86}$ $3 \overline{) 59}$
2. Have pupils copy these problems into their exercise books.
3. Guide pupils to solve the first 2 problems step by step.
4. Read the problems and answers aloud with pupils. (Answers: $99 \div 6 = 16 \text{ R } 3$, $65 \div 4 = 16 \text{ R } 1$)




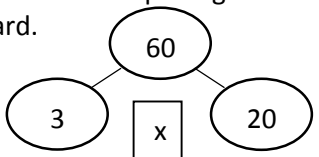
Independent Practice (10 minutes)

1. Have pupils complete the last 2 problems on their own.
2. **Write** the following problems on the board:
- a) $74 \div 6$
- b) $84 \div 5$
3. **Say:** Copy these extra two problems into your notebook and solve them individually.

Closing (2 minutes)

1. Go over answers with the class. (Answers: $86 \div 5 = 17 \text{ R } 1$, $59 \div 3 = 19 \text{ R } 2$; $74 \div 6 = 12 \text{ R } 2$; $84 \div 5 = 16 \text{ R } 4$)
2. **Say:** Good job today, pupils! You learned how to divide using long division with a remainder.

Lesson Title: Checking Division Calculations without Remainder by Using Estimation	Theme: Everyday Arithmetic Long Division	
Lesson Number: M-04-058	Class/Level: Primary 4	Time: 35 minutes

 <p>Learning Outcomes: By the end of the lesson, pupils will be able to check division calculations without remainder by using estimation.</p>	 <p>Teaching Aids None</p>	 <p>Preparation 1. Write the division problems from the lesson on the board. 2. Write the following number circles for the opening on the board.</p> <div style="text-align: center;">  </div>
--	--	--

Opening (3 minutes)

1. Review how to use multiplication to solve division.
2. Read the number circles with pupils.
3. Invite four pupils to give the 2 multiplication problems and the 2 division problems that can be made with the numbers. (Answers: $3 \times 20 = 60$, $20 \times 3 = 60$, $60 \div 3 = 20$, $60 \div 20 = 3$)
4. **Ask:** What 1 – digit multiplication facts and 1 – digit division facts with 3 are these like? Raise your hand to answer. (Answers: $3 \times 2 = 6$, $2 \times 3 = 6$, $6 \div 3 = 2$, $6 \div 2 = 3$)

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to learn how to use estimation to check our answers to division problems.
2. **Say:** Estimation is when we change a number to an ‘easy number’ or round off the numbers to make them easy numbers. We can check division problems by changing the big number to an ‘easy number.’ Then we see if our estimation is close to our real answer. If it is, our real answer is correct.
3. Show pupils the first problem written on the board.

$$\begin{array}{r} 32 \\ 3 \overline{) 96} \end{array}$$

4. **Say:** I am going to check this answer with estimation. First, I change 96 to an ‘easy number’. I do this by changing the number in the ones place to a 0 or rounding it down to an even 90. This is called ‘front-end estimation.’ We use the front end of the number to estimate.

$$\begin{array}{r} 32 \\ 3 \overline{) 96} \quad 90 \end{array}$$

5. **Say:** Next I do $90 \div 3$ in my head. I know $9 \div 3 = 3$. I use that to know $90 \div 3 = 30$.
6. **Ask:** Is 30 close to 32? Point your thumb up if 30 is close to 32. Point your thumb down if 30 is not close to 32. (Answer: Pupils point their thumbs up. 30 is close to 32).

- Say:** My estimation is 30. It is close to my answer of 32. So 32 is the correct answer.
- Show pupils the second problem written on the board.

$$\begin{array}{r} 4 \quad 1 \\ 4 \overline{) 84} \end{array}$$

- Say:** I am going to check this answer with estimation. First, I change 84 to an 'easy number'. I do this by changing the number in the ones place to a 0 or rounding down. This is called 'front-end estimation.' We use the front end of the number to estimate.

$$\begin{array}{r} 4 \quad 1 \\ 4 \overline{) 84} \quad 80 \end{array}$$

- Say:** Next I do $80 \div 4$ in my head.
- Ask:** What is $8 \div 4$? Raise your hand to answer. (Answer: 2) What is $80 \div 4$? Raise your hand to answer. (Answer: 20)
- Ask:** Is 20 close to 41? Point your thumb up if 20 is close to 41. Point your thumb down if 20 is not close to 41. (Answer: Pupils point their thumbs down. 20 is not close to 41.)
- Say:** My estimation is 20. It is not close to my answer of 41. So 41 is not the correct answer.

Guided Practice (10 minutes)

- Show pupils the problems a - d written on the board:
 - $3 \overline{) 96}$
 - $2 \overline{) 64}$
 - $3 \overline{) 63}$
 - $2 \overline{) 86}$
- Have pupils copy these problems into their exercise books.
- Tell pupils to work with a partner to use front-end estimation to check the answers to the first 2 problems.
- Go over answers with pupils. (Answers: a. Yes, $90 \div 3 = 30$. 32 is close to 30; b. No, $60 \div 2 = 30$. 42 is not close to 30.)




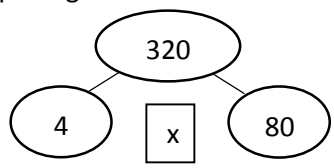
Independent Practice (10 minutes)

- Have pupils complete the last 2 problems on their own.
- If pupils finish early, tell them to solve problem d. using long division.
- Go over answers with pupils. (Answers: c. Yes, $60 \div 3 = 20$. 21 is close to 20; d. No, $80 \div 2 = 40$. 63 is not close to 40.)

Closing (2 minutes)

- Say:** Fatu knows $54 \div 3$ is less than 20. Turn to your partner and say how Fatu knows this.
- After 1 minute, invite a pupil to share his or her idea. (Answer: $60 \div 3 = 20$. 54 is less than 60, so $54 \div 3$ is less than 20.)
- Say:** Good job today! You used the method of estimation to check the answers to your division problems!

Lesson Title: Division of 3-Digit Whole Number by 1-Digit Number without Remainder Using Long Division	Theme: Everyday Arithmetic Long Division	
Lesson Number: M-04-059	Class/Level: Primary 4	Time: 35 minutes

 <p>Learning Outcomes By the end of the lesson, pupils will be able to divide a 3-digit whole number by a 1-digit number without a remainder using long division.</p>	 <p>Teaching Aids None</p>	 <p>Preparation Write the following number circles for the opening on the board.</p> <div style="text-align: center;">  </div>
---	--	--

Opening (3 minutes)

1. Revise how to use multiplication facts to solve division facts.
2. Read the number circles with pupils.
3. Invite four pupils to give the 2 multiplication problems and the 2 division problems that can be made with the numbers. (Answers: $4 \times 80 = 320$, $80 \times 4 = 320$, $320 \div 4 = 80$, $320 \div 80 = 4$)

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to learn to divide 3-digit numbers by 1-digit number using long division.
2. **Write** on the board:

$$3 \overline{) 735}$$

3. Tell pupils to copy the problem. They will solve each step in their exercise book as you solve it on the board.
4. Read the problem with pupils '735 divided by 3'.
5. **Say:** We start with the hundreds digit in long division with 3 digit numbers. I need to divide the 7 in the hundreds place by 3.
6. **Say:** I don't know what 7 divided by 3 is. I must use the closest number I can less than the '7'. The closest number I can use is 6 because I know $6 \div 3 = 2$. Write 2 above the 7. Write 6 below the 7 because $3 \times 2 = 6$.

$$\begin{array}{r} 2 \\ 3 \overline{) 735} \\ \underline{6} \end{array}$$

7. **Say:** I used $6 \div 3$, not $7 \div 3$. I need to show the difference between 7 and 6. I need to subtract $7 - 6$.

$$\begin{array}{r} 2 \\ 3 \overline{) 735} \\ \underline{-6} \\ 1 \end{array}$$

8. **Say:** I need to use the '1' that shows the difference between the '7' and the '6'. It is in the hundreds place. The 3 is in the tens place. I can put them together. I circle 13 to remember to use it to divide.
9. **Say:** The closest division fact to '13 ÷ 3' is '12 ÷ 3.' I know $12 \div 3 = 4$. Write 4 above the 3. Write 12 under the '13' because 4×3 is 12.

$$\begin{array}{r}
 24 \\
 3 \overline{) 735} \\
 \underline{- 6} \\
 13 \\
 \underline{- 12} \\

 \end{array}$$

10. **Say:** I used $12 \div 3$, not $13 \div 3$. Subtract $13 - 12 = 1$. Bring down the 5 to make 15. Circle 15. Divide 15 by 3. Write 5 above the 5 in the ones place.

$$\begin{array}{r}
 245 \\
 3 \overline{) 735} \\
 \underline{- 6} \\
 13 \\
 \underline{- 12} \\
 15 \\
 \underline{- 15} \\

 \end{array}$$

Guided Practice (10 minutes)

- Write on the board:
 - $3 \overline{) 861}$
 - $2 \overline{) 652}$
 - $3 \overline{) 564}$
 - $2 \overline{) 386}$
- Have pupils copy these problems into their exercise books.
- Guide pupils to solve the first 2 problems step by step.
- Read the problems and answers aloud with pupils. (Answers: a. $861 \div 3 = 287$; b. $652 \div 2 = 326$)




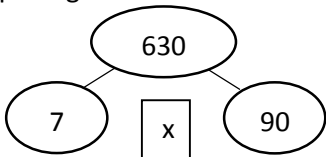
Independent Practice (10 minutes)

- Have pupils complete the last 2 problems on their own.

Closing (2 minutes)

- Go over answers with the class. (Answers: c. $564 \div 3 = 188$; d. $386 \div 2 = 193$)
- Say:** Good job today, pupils! You solved division problems with 3 digits using long division.

Lesson Title: Division of a 3-Digit Whole Number by a 1-Digit Number with Remainder Using Long Division	Theme: Everyday Arithmetic Long Division	
Lesson Number: M-04-060	Class/Level: Primary 4	Time: 35 minutes

 <p>Learning Outcomes: By the end of the lesson, pupils will be able to divide a 3-digit whole number by 1-digit number with remainder using long division.</p>	 <p>Teaching Aids None</p>	 <p>Preparation Write on the board number circles for the opening.</p> <div style="text-align: center;">  </div>
---	--	--

Opening (3 minutes)

1. Review how to use multiplication facts to solve division facts.
2. Read the number circles with pupils.
3. Invite 4 pupils to give the 2 multiplication problems and the 2 division problems that can be made with the numbers. (Answers: $7 \times 90 = 630$, $90 \times 7 = 630$, $630 \div 7 = 90$, $630 \div 90 = 7$)

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to learn to divide 3-digit numbers by 1-digit numbers with remainders using long division.
2. **Write** on the board:

$$3 \overline{) 827}$$

3. Tell pupils to copy the problem. They will solve each step in their exercise book as you solve it on the board.
4. Read the problem with pupils '827 divided by 3'.
5. **Say:** We start with the hundreds digit in long division with hundreds. I need to divide the 8 in the hundreds place by 3.
6. **Say:** I don't know what 8 divided by 3 is. I must use the closest number I can less than the '8'. The closest number I can use is 6 because I know $6 \div 3 = 2$. Write 2 above the 8. Write 6 below the 8 because 2×3 is 6.

$$\begin{array}{r} 2 \\ 3 \overline{) 827} \\ \underline{6} \end{array}$$

7. **Say:** I used $6 \div 3$, not $8 \div 3$. I need to show the difference between 8 and 6. I need to subtract $8 - 6$.

$$\begin{array}{r} 2 \\ 3 \overline{) 827} \\ \underline{-6} \\ 2 \end{array}$$

8. **Say:** The '2' shows the difference between the '8' and the '6' is in the hundreds place. I can put it together with the '2' in the tens place to make 22. I circle 22 to remember to use it to divide.
9. **Say:** The closest division fact to '22 ÷ 3' is '21 ÷ 3 = 7'. Write 7 above the 2. Write 21 under the 22 because 7 x 3 is 21.

$$\begin{array}{r}
 27 \\
 3 \overline{) 827} \\
 \underline{- 6} \\
 22 \\
 \underline{- 21} \\
 1
 \end{array}$$

10. **Say:** Subtract 22 - 21 = 1. Bring down the 7 to make 17. Circle 17. The closest division fact to '17 ÷ 3' is '15 ÷ 3 = 5.' Write 5 above the 7. Subtract 17 - 15 because 5 x 3 is 15.

$$\begin{array}{r}
 275 \text{ R } 2 \\
 3 \overline{) 827} \\
 \underline{- 6} \\
 22 \\
 \underline{- 21} \\
 17 \\
 \underline{- 15} \\
 2
 \end{array}$$

11. **Say:** We cannot divide any further because 3 cannot go into the 2. The 2 then becomes the remainder.

Guided Practice (10 minutes)

- Write on the board:
 - $3 \overline{) 863}$
 - $2 \overline{) 653}$
 - $3 \overline{) 565}$
 - $2 \overline{) 387}$
- Have pupils copy these problems into their exercise books.
- Guide pupils to solve the first 2 problems step by step.
- Read the problems and answers aloud with pupils. (Answers: a. $863 \div 3 = 287 \text{ R } 2$; b. $653 \div 2 = 326 \text{ R } 1$)

Independent Practice (10 minutes)

- Have pupils complete the last 2 problems on their own.

Closing (2 minutes)

- Go over answers with the class. (Answers: c. $565 \div 3 = 188 \text{ R } 1$; d. $387 \div 2 = 193 \text{ R } 1$)
- Say:** Good job today, pupils! You divided 3 digit numbers by 1 digit to find solutions with a remainder.

FUNDED BY



IN PARTNERSHIP WITH



NOT FOR SALE

Document information:

Leh Wi Learn (2016). "*Maths, Class 04, Term 01, lesson plan.*" A resource produced by the Sierra Leone Secondary Education Improvement Programme (SSEIP). DOI: 10.5281/zenodo.3745106.

Document available under Creative Commons Attribution 4.0, <https://creativecommons.org/licenses/by/4.0/>.

Uploaded by the EdTech Hub, <https://edtechhub.org>.

For more information, see <https://edtechhub.org/oer>.

Archived on Zenodo: April 2020.

DOI: 10.5281/zenodo.3745106

Please attribute this document as follows:

Leh Wi Learn (2016). "*Maths, Class 04, Term 01, lesson plan.*" A resource produced by the Sierra Leone Secondary Education Improvement Programme (SSEIP). DOI 10.5281/zenodo.3745106. Available under Creative Commons Attribution 4.0 (<https://creativecommons.org/licenses/by/4.0/>). A Global Public Good hosted by the EdTech Hub, <https://edtechhub.org>. For more information, see <https://edtechhub.org/oer>.