Chapter 11 Large Numbers

1. Unit Objectives

- To deepen an understanding of how to express whole numbers and develop an ability to use numbers. (3.1.1.a)
- To know about a unit of ten thousands place. (3.1.1 a)To know about numbers of 10 times, 100 times, and 1/10 and how to express them. (3.1.1.a and b)
- To deepen an understanding of the relative largeness of numbers. (3.1.1.a)
- To think about how to calculate addition and subtraction of many-digit numbers and understand that they can be calculated based on basic calculations of 2-digit numbers, etc. (3.1.2.a and c)
- To calculate addition and subtraction certainly and use them accurately. (3.1.2.b and c)

2. Teaching Overview

Students learned 4-digit numbers already. Based on the knowledge, they will expand their knowledge on reading, writing, ordering, the sizes and structures of large numbers.

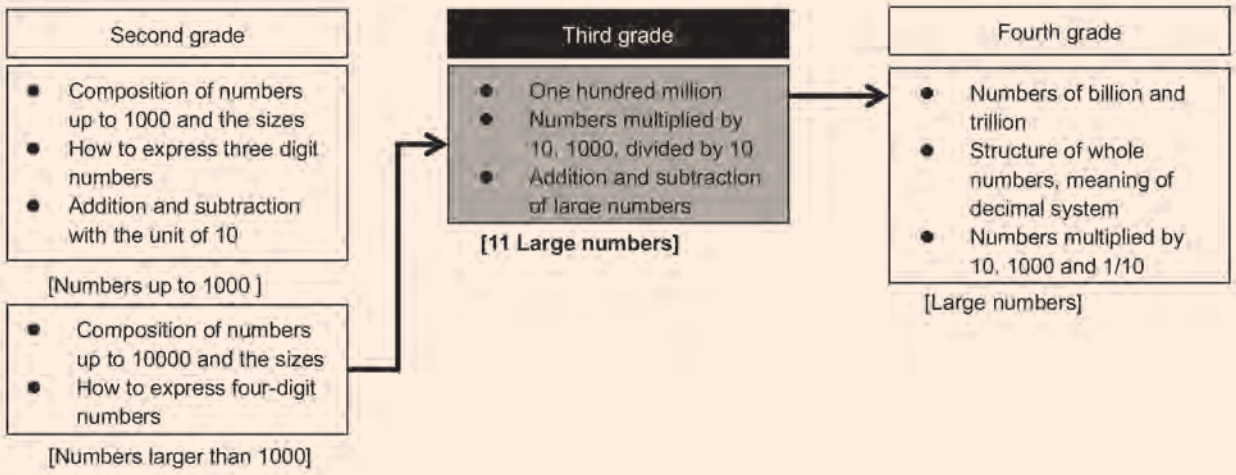
Ten and Hundred Thousands Place : First, students should be able to explain and understand 10,000 from various perspectives such as "the next number of 9999", "the number 10 bigger than 9990", "composed number of 5000 and 5000, the number made up with 100 of 100s, etc. In this manner, a number should be explained and understood relatively with other numbers.

Structure of Large Numbers : Students learn the structure and relative amount of 5 and 6-digit whole numbers here. Visualisation with number lines will help students understand the orders and relative sizes of numbers.

10 times, 100 times and Divided by 10 : Place value tables will help students to see and recognise that the arrangement of numbers will not change but the place moves by 1 or 2 steps to the right or left by multiplying or dividing by 10, 100 etc.

Addition and Subtraction : Encourage students to apply the knowledge of addition and subtraction already learned before for larger numbers.

3. Related Learning Contents



Unit 11

Unit: Large Numbers
Sub-unit: 1. Ten and Hundred Thousand Place
Lesson 1 of 2 (Double Period)

Textbook Page : p.109~p.110
Actual Laesson 074

Sub-unit Objectives

- To know about the structure and how to read and express numbers up to the ten thousands place and be able to write them accurately.
- To think about how to read and the structure of numbers up to the millions place and be able to write them accurately.

Lesson Objectives

- To know about the structure and how to read and express numbers up to the thousands place and write them accurately.

Prior Knowledge

- Numbers up to the thousands place
- Read and write numbers up to the thousands place.

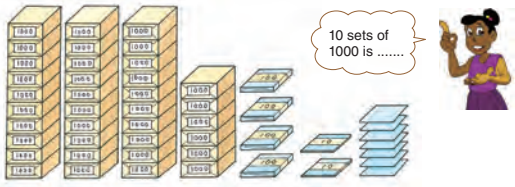
Preparation

- Enlarged picture in textbook
- Number line
- Place value charts

Assessment

- Think of how to read and express numbers up to the thousands place and read and write them accurately. F
- Do the exercise correctly. S

11 Large Numbers



1 Ten and Hundred Thousand Place

How to read and write thousands place.

1 How many sheets of paper are there in the above figure?

1 If we make bundles of ten thousand, how many can we make?

3 sets of ten thousand is written as 30000 and is read as **thirty thousand**. It is also written as 30 **thousand**.

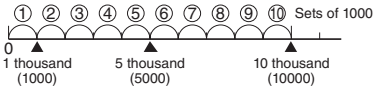
2 How many sheets of paper are there altogether? 36427 sheets.

Three ten thousand, six thousand, four hundred, two ten, and seven ones makes 36427 and it is read as thirty six thousand, four hundred and twenty seven.

Ten thousands place	Thousands place	Hundreds place	Tens place	Ones place
3	0	0	0	0
	6	0	0	0
		4	0	0
			2	0
				7

Let's find the structure of numbers larger than 10000 and how to express them.

The number that is 10 sets of one thousand (1000) is written as **10000 or 10 thousand** and is read as ten thousand.



2 Write the following numbers in numerals while being careful about their place values.

1 The number that is two sets of ten thousand, four sets of thousand, nine sets of hundred, a set of ten and eight ones.

2 The number that is the sum of seven sets of ten thousand and 860.

3 The number that is the sum of eight sets of ten thousand and nine sets of ten.

4 The number that is four sets of ten thousand.

	Ten thousands place	Thousands place	Hundreds place	Tens place	Ones place
1	2	4	9	1	8
2	7	0	8	6	0
3	8	0	0	9	0
4	4	0	0	0	0

Exercise

1 Read the following numbers.
① 48219 ② 98056 ③ 28000 ④ 70006
(1) Forty eight thousand two hundred and nineteen.
(2) Ninety eight thousand and fifty six.
(3) Twenty eight thousand. (4) Seventy thousand and six

2 Write the following numbers in numerals.
① Eighty six thousand two hundred and fifty nine 86259
② Fifty thousand and thirty two 50032
③ Twenty thousand and eight hundred 20800

3 Write the following numbers in numerals.
① The number that is the sum of three sets of ten thousand, nine sets of thousand and five sets of ten. 39050

□ + □ = 109 110 = □ × □

Lesson Flow

1 ① ① Think about how many papers are there.

T Introduce the main task.
T Shows picture and ask which is 10 sets of 1000? What will be the total?
S Discuss, identify and give answer as 10 000.
T Introduce this chapter on numbers larger than ten thousand by refering to the picture.

2 ② Think about numbers which have 3 sets of ten thousand.

T How many sheets of paper are there in the picture?
TN Focus on 3 sets of ten thousand only.
S Identify and respond that there are 3 stacks of 10000. (answer 30 000 sheets)
T Explain the important point in the box

3 Think about the remaining sheets of papers.

T Ask how many remaining sheets of paper are there?
TN Focus on ; 6 sets of 1000, 4 sets of 100 and 2 sets of 10 and 7 set of 1.
S Identify remaining sheets of papers as 6427.
T Confirm using the place value chart and elaborate.
T Confirm how to write an addition of thirty-six thousand and 427 by using a place values board.
T Explain the important point in the box

4 ② Think about the structure and how to write and read numbers up to ten thousands place.

TN Explain to students based on the idea of "place values".
S Complete activities from ① to ④ on place value chart.
TN Ensure students place numbers correctly.

5 Do the exercise and summarise learning.

S Do the exercise and summarise things learned.

• Teacher's Notes •

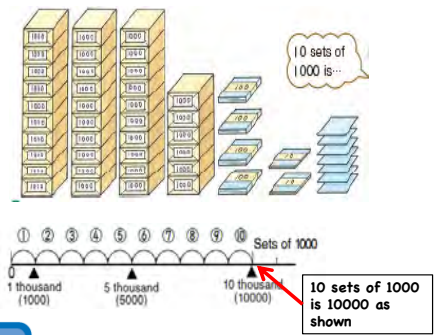
Making Use of a Place Value chart to Operate Place Values

One can deepen an understanding of how to read large numbers by using a place value chart to operate place values. It is easier to read and understand the structure of numbers after separating three digits counting from the ones place value without chanting "one, ten, hundred, thousand, ten thousand, hundred thousand, million, ten million….etc"
But, some students might find difficulties in reading and writing large numbers with empty places (zero in place value) . As for these students, have them write large numbers on a place value chart to operate place values and read them. When doing so, it is important for them to focus on empty places of 0.
Also, it is good to understand that a way of expressing is a base-10 system. So, we'd like to make a full use of a board to operate place values. Also, we'd like to have students think about numbers up to 7-digit numbers freely, write them on the board to operate place values and read them.

Sample Blackboard Plan

Date: Chapter 11: Large Numbers Topic: Tens and Hundreds Thousands Place Lesson Number: 1 out of 2

Main Task: Let's think about the structure of numbers larger than 10000.

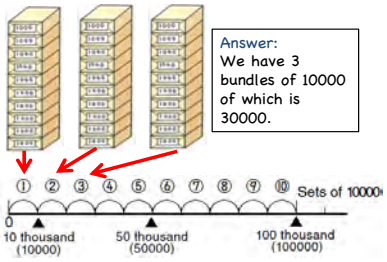


1 Let's think about how many sheets of paper are there in the above figure.

Expected response from students:
Own way of reading: 36 427

MT

1 How many bundles of 10 000 can we have?



Answer:
We have 3 bundles of 10000 of which is 30000.

2 How many sheets of paper altogether?

Answer:
1. 36427
2. Thirty six thousand four hundred and twenty seven.

2

	Ten thousands place	Thousands place	Hundreds place	Tens place	Ones place
1	2	4	9	1	8
2	7	0	8	6	0
3	8	0	0	9	
4	0	4	0	0	0

Summary
■ Read and write numbers in numerals while being careful of their place values up to ten thousand.

Unit 11

Unit: Large Numbers
Sub-unit: 1. Ten and Hundred Thousand Place
Lesson 2 of 2 (Single Period)

Textbook Page : p.111-p.112
Actual Lesson 075

Lesson Objectives

- To think about how to read the structure of numbers up to hundred thousands place.
- To read and write numbers up to hundred thousands place accurately.

Prior Knowledge

- Numbers up to ten thousands place
- Read and write numbers up to ten thousands place.

Preparation

- Place value charts (enlarged)
- How to read & write number chart.

Assessment

- Think about how to read the structure of numbers up to hundred thousands place and read and write them accurately. F
- Do exercise correctly at the end of the lesson. S

3 Making 6-digit number.
In 2011, Papua New Guinea census statistic showed that the number of male living in Eastern Highlands Province was 311000. Let's think about this number.

Ten thousand		1	0	0	0	0
10 sets of ten thousand make a hundred thousand	1	0	0	0	0	0
	Hundred thousands place	Ten thousands place	Thousands place	Hundreds place	Tens place	Ones place
	3	1	1	0	0	0



1. How many sets of the hundred thousand, ten thousand and thousand are combined to make this number?
(1) 3 sets of one hundred thousand, one set of ten thousand and one set of thousand.
2. Read the number 311000.
(2) Three hundred and eleven thousand

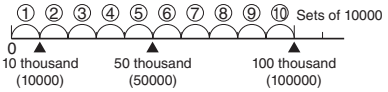
4 Let's read the number of people in the Highlands Region in 2011 below.
How to read and write up to hundred thousands place.

1. Southern Highlands Province: 510 245
2. Western Highlands Province: 249 449
3. Enga Province: 432 045
4. Hela Province: 249 449
5. Jiwaka Province: 343 987
6. Simbu Province: 376 473




5 Let's make the largest number and the second smallest number by arranging the number cards from 1 to 6.
Largest 654321
2nd: 123465

The number that is 10 sets of ten thousand (10000) is written as **100000 or 100 thousand** and is read as **hundred thousand**.



Exercise

1 Read the following numbers.
① The number of babies born in Papua New Guinea in 2012 was 210181.
(1)Two hundred ten thousand one hundred and eighty one.
② The number of Papua New Guinea small holder coffee producers in 2008 was 397772.
(2)Three hundred ninety seven thousand seven hundred and seventy-two.

2 Write the following numbers in numerals.
① The population of Lae city in 2000 was one hundred and nineteen thousand, one hundred and seventy four.
(1)119174
② The number of people living with HIV in Papua New Guinea in 2015 was two hundred, ten thousand, eight hundred and eleven.
(2) 210811

How to Read and Write Large Numbers

Read after separating the third and fourth place by counting from the ones place. The number is read as Four hundred and sixty eight thousand, one hundred and forty nine. 468 149
For every 3-digit numbers, we include a space or comma.
Examples: ① Include **space** 468 149
② include **comma** 468, 149

□ + □ = 111 112 = □ × □

Lesson Flow

1 Review the previous lesson.

T Introduce the main task.

2 3 Explore the numbers in the hundred thousands place.

S Read and understand the situation of 3.
T Use the place value chart to confirm that the number is increased from 10 thousands place to 100 thousands place.

3 1 and 2 Think about the number of each"place value"and read the number 311000.

T Let's think about how many sets of hundred thousand, ten thousand and thousand are there?
TN Explain to students based on the idea of "place values" .
S 3 sets of hundred thousand, 1 set of ten thousand and 1 set of thousand.
T 2 How to read 311000?
S Read as three hundred and eleven thousand.
T Explain the important point in the box .

4 4 Read numbers up to hundred thousands place.

T Allow students to work in pairs or groups to read the numbers of each province.
S Each member of a pair or group reads the numbers of people from (1) to (6).
S Allow corrections to be made by a friend when each group read numbers that are not correct.
T Confirm the answers.

5 5 Make 6-digit numbers by arranging number cards from 1 to 6.

T Have students to arrange number cards from 1 to 6 and make 6-digit numbers.
S Find the largest and second smallest numbers.

6 Do the exercise.

7 Summarise using the note How to read and write numbers

Sample Blackboard Plan

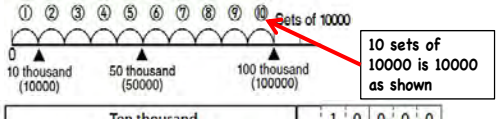
Date: Chapter 11: Large Numbers Topic: Tens and Hundreds Thousands Place Lesson Number: 2 out of 2

Main Task: Let's think about how to read and write numbers larger than 100000.

MT

3 Let's think about this number 311000 and how can we say it?

Expected response from students. Our own way of saying the number. 3 hundred, 11 thousand.



Ten thousand		1	0	0	0	0
10 sets of ten thousand make a hundred thousand	1	0	0	0	0	0

Hundred thousands place	Ten thousands place	Thousands place	Hundreds place	Tens place	Ones place
3	1	1	0	0	0

2. Study the place value chart and discuss how has the number increased?

Expected response from students.
The number has increased from ten thousands place to hundred thousands place.

1 Idea of place value.

Hundred thousand	3 sets
Ten thousand	1 set
Thousand	1 set

2 Read the number, 311000
Answer: Three hundred eleven thousand

4 Read the numbers up to hundred thousands place.

1 Five hundred ten thousand, two hundred forty-five.
2 Two hundred forty nine thousand, four hundred forty-
3 ne
4 Four hundred thirty two thousand, and forty-five
Three hundred forty three thousand, nine hundred
5 ghty-seven.
Three hundred seventy six thousand, four hundred seventy-three

5 Arrange the number cards from 1 to 6.

1	2	3	4	5	6

1. Largest number is 654321

2. Second smallest number is 123465

To make the second smallest number, switch number 6 in the ones place to tens and move 5 in the tens place to ones.

Summary
■ Read and write numbers in numerals while being careful of their place values up to hundred thousand.

Unit 11

Unit: Large Numbers
Sub-unit: 2. The Structure of Large Numbers
Lesson 1 of 2 (Single Period)

Textbook Page : p.113-p.114
Actual Lesson 076

Sub-unit Objectives

- To deepen the understanding of the structure of numbers up to 100 thousand.
- To express the numbers based on the unit of thousand.
- To express, read and compare the numbers on the number line.

Lesson Objectives

- To deepen understanding of structure of numbers up to 100 thousand.
- To know 1 million.

Prior Knowledge

- Numbers up to hundred thousands place
- Read and write numbers up to hundred thousand place.

Preparation

- Place value charts (enlarged)
- Cards of numbers within 0 - 9
- Enlarged summary points

Assessment

- Think about how to read and write numbers based on the structure of the number. F
- Appreciate the advantage of reading numbers based on thousand. F
- Solve exercises correctly. S

Structure of number up to hundred thousand.

2 The Structure of Large Numbers

1 Write the following numbers in numerals and read them.

1. The number that is the sum of 3 sets of ten thousand, 7 sets of thousand and 1 hundred.
2. The number that is the sum of 361 sets of thousand and 480.
3. The number that is the sum of 7 sets of a hundred thousand and 9 sets of a hundred.

	Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Ones place
1		3	7	1	0	0
2	3	6	1	4	8	0
3	7	0	0	9	0	0

Relative size of large number.

2 Let's think about 245000.

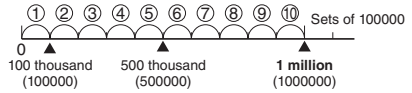
1. How many sets of hundred thousand, ten thousand and thousand are there in this number?
   (1) 2 sets of hundred thousand, 4 sets of ten thousand and 5 sets of thousand.
2. How many sets of 1000 are there to make this number? 245
3. How many sets of 100 are there to make this number? 2450

245000 is also written as 245 thousand.

3 How many sets of hundred thousands are there to make 1000000?

The word "million." How to read and write million.

The number that is 10 sets of hundred thousand is written as 1000000 and read as **one million**.



□ − □ = 113

Exercise

Write the following numbers and read them.

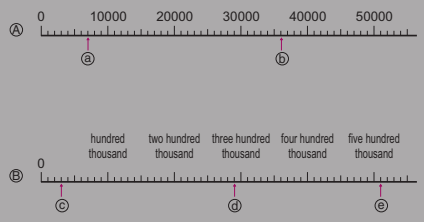
① The number that is the sum of 3 sets of ten thousand and 8 sets of thousand. 38000

② The number that is the sum of 5 sets of hundred thousand, 2 sets of ten thousand and 9 sets of hundred. 520900

4 Let's think about the following number lines.

What is expressed by each scale?

Which numbers are expressed by ⓐ, ⓑ, ⓒ, ⓓ and ⓔ ?



A straight line, with marked points that are equally spaced in every point on the line corresponds to a number, is called a **number line**.
On the number line, the number gets larger as you move towards the right.

114 = □ × □

Lesson Flow

1 Review the previous lesson.

T Introduce the main task.

2 1 Think about how to read and write numbers from 1 – 3 based on the structure of the numbers.

S Confirm learning on how to express large numbers using the structure of the numbers.

S Encourage 3 students to pick up number cards to represent on the place value chart.

3 2 1 Think about the relative size of large number by filling in the numbers on the place value board.

T Confirm each number and its digit by filling in the numbers in the place value chart.

4 2 2 3 Think about the number of each digit based on thousands and ten thousands.

S Understand that 245000 can be expressed as 245 thousand and its advantage.

5 Think about the necessity of new digit filling in the numbers in the place value chart.

S Write 100 thousand and 1 million on the board, and recognise that 1 million is 10 times of 100 thousand.

T/S Answer task 3 and explain the summary points .....

6 Solve the exercise.

S Solve exercises (1) and (2).

S Summarise the new digit into the place value and its structure.

Sample Blackboard Plan

Date: Chapter 11: Large Numbers Topic: Structure of Large Numbers Lesson Number: 1 out of 2

MT **Main Task:** Let's think about the structure of large numbers.

1 Write numerals and read them.

1

Ten thousand	3 sets	3 × 10000	30000
Thousand	7 sets	7 × 1000	7000
Hundred	1 set	1 × 100	100

Ans: 30000 + 7100 = 37100

2

Thousand	361 sets	361 × 1000	361000
Hundred	48 sets	48 × 100	480

Ans: 361000 + 480 = 361480

3

Hundred thousand	7 sets	7 × 100000	700000
Hundred	9 set	9 × 100	900

Ans: 700000 + 900 = 700900

	Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Ones place
1		3	7	1	0	0
2	3	6	1	4	8	0
3	7	0	0	9	0	0

2

Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Ones place
2	4	5	0	0	0

1

2 sets of Hundred thousand	2 × 100000
4 sets of Ten thousand	4 × 10000
5 sets of Thousand	5 × 1000

2

245 sets of Thousand	245 × 1000

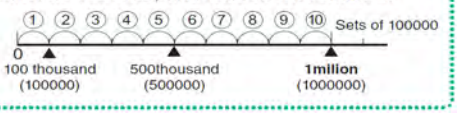
3

2450 sets of Hundred	2450 × 100

245000 is also written as 245 thousand.

3 How many sets of hundred thousand are there to make 10000000?

The number that is 10 sets of hundred thousand is written as 1000000, and read as **one million**.



Ans: 10 sets of hundred thousand makes 1 million.

Summary

- Read and write sets of numbers up to ten thousand and hundred thousand while being careful of their place values.
- 10 sets of 100000 is written as 1000000 and read as one million

Unit 11

Unit: Large Numbers
Sub-unit: 2. The Structure of Large Numbers
Lesson 2 of 2 (Double Period)

Textbook Page : p.114~p.116
Actual Lesson 077

Lesson Objectives

- To express, read and compare large numbers on the number line.

Prior Knowledge

- The structure of large numbers
- Place value chart for task 4 and 6
- Investigating numbers up to hundred thousand

Preparation

- Place value charts (enlarged)
- Number lines (Equally spaced)
- Summary points

Assessment

- Enjoy solving various problems of large number. F
- Know what number line is. F
- Solve the exercise correctly. S

• Teacher's Notes •

This is the first lesson on number line. Spend enough time with the students for them to understand what a number line is.
Also on inequality signs use terms larger than (>) and smaller than (<) or equal to (=).

Exercise

1 Fill in the ☐ with a number.

① 99900 — 99950 — 100000 — 100050

② 528 thousand — ☐ — 532 thousand ----

---- ☐ — 536 thousand — 538 thousand

534 thousand

530 thousand

2 Arrange the following numbers in ascending order.

① (30001, 190000, 210003, 99900)

30001, 99900, 190000, 210003

② (400000, 94000, 170000, 240000)

94000, 170000, 240000, 400000

3 Fill in the ☐ with a sign of inequality.

① 54300 < 64100 ② 17300 > 17030

Exercise

Write the following numbers and read them.

① The number that is the sum of 3 sets of ten thousand and 8 sets of thousand.

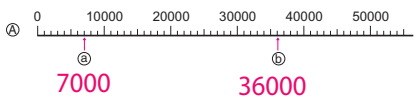
② The number that is the sum of 5 sets of hundred thousand, 2 sets of ten thousand and 9 sets of hundred.

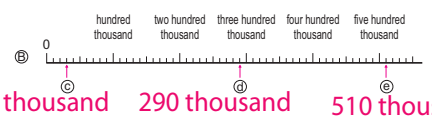
How to show the number on the number line.

4 Let's think about the following number lines.

What is expressed by each scale?

Which numbers are expressed by ⓐ, ⓑ, ⓒ, ⓓ and ⓔ ?





A straight line, with marked points that are equally spaced in every point on the line corresponds to a number, is called a **number line**.
On the number line, the number gets larger as you move towards the right.

How to make a number line.

5 Draw the number line with a (unit) Scale of 10 thousand, marked with ↑ on the line corresponding to the following numbers.

6 Fill in the ☐ with a number.

① 99998 — 99999 — 100000 — 100001 — 100002

② 750 thousand — 800 thousand — 850 thousand —

---- 900 thousand — 950 thousand

Comparing large numbers.

7 Arrange the following numbers in descending order and line them vertically in the table on the right.

① 386020 ② 378916 ③ 89000

Compare the largest place numbers.

	Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Ones place
①	3	8	6	0	2	0
②	3	7	8	9	1	6
③			8	9	0	0

8 Show the relationship between the two numbers using >, < and = .

45000 < 140000

Meaning of the sign of inequality and how to use them.

The symbols < and > are called **inequality signs**.
These symbols are used to compare two numbers, whether one number is larger or smaller than the another number.

Lesson Flow

1 Review the previous lesson.

T Introduce the main task.

2 4 ① Think about 1 scale that expresses how many numbers.

T Paste a chart on the board for the number line of 4 Ⓐ and Ⓑ.
T What is the difference compared from before?
S The numbers are on the number line.
S Notice that it is easy to understand the size of the number if they are on the number line, and also scale should be changed depending on the size of the number.

3 Find the number based on the size of 1 scale.

S Think of a better way to find the number by comparing ideas.
T Explain ..... and confirm the definition of the number line and how to express the numbers on the line.

4 5 Think about how to draw a number line.

TN Distance among scales must be same. It is easy to understand if 5th scale is written a bit longer and 10th scale is extended further.

5 6 Think about the order of the number.

S Find the answer by thinking about the difference of before and after the number.

6 7 Compare the numbers focusing on a unit.

T Compare and write these large numbers in the number table.
TN Confirm the following two points.
① The number which has the greater digit is bigger than the other.
② If the digit is same, the number which has greater number in superior digit is bigger than the other.
S Put the numbers in the place value chart.

7 8 Know the meaning and how to use a sign of inequality .

T Explain .....

8 Solve the exercise.

T Summarise the lesson.

Sample Blackboard Plan

Date: Chapter 11: Large Numbers Topic: Structure of Large Numbers Lesson Number: 2 out of 2

Main Task: Let's think about how to use a number line.

MT

4 How can we read off numbers expressed on a number line?
(1) Each scale represents 1000
(2) The numbers shown by the arrow are;

Ⓐ 0 10000 20000 30000 40000 50000
ⓐ 7000 ⓑ 36000

Ⓑ 0 hundred thousand, two hundred thousand, three hundred thousand, four hundred thousand, five hundred thousand
ⓒ 30 thousand ⓓ 290 thousand ⓔ 510 thousand

A straight line, with marked points that are equally spaced where in every point on the line corresponds to a number, is called a **number line**.
On the number line, the number gets larger as you move towards the right.

5 Draw a number line with a unit scale of 100thousand and mark with and arrow on the line corresponding to the number?

1.First draw a straight line with a unit.
2.The unit scale is 100 thousand.
3.Every marked point must be of the same length.
4.Numbers must corresponding to each point.
5.The more rightwards the measure extends the larger the number gets.
6.Finally use an arrow ↑ to mark the following numbers corresponding on the line.

0 100000 200000 300000 400000
180000 320000 250000

6 Missing numbers are;
① 99998 → 99999 → 100000 → 100001 → 100002
② 750 thousand → 800 thousand → 850 thousand → 900 thousand → 950 thousand

7 Arrange the numbers in descending order and line them vertically.

	Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Ones place
①	3	8	6	0	2	0
②	3	7	8	9	1	6
③		8	9	0	0	0

8 Show the relationship between two numbers using the inequality signs.
45000 < 140000

The symbols < and > are called **inequality signs**.
These symbols are used to compare two numbers, whether one number is larger or smaller than the another number.

Summary
•A straight line that has every marked point with a unit scale of the same length is called a number line.
•Meaning of the signs of inequality.

Unit 11

Unit: Large Numbers
Sub-unit: 3. 10 Times, 100 Times and Divided by 10
Lesson 1of 2 (Single Period)

Textbook Page : p.117
Actual Lesson 078

Sub-unit Objectives

- To understand how to express numbers of ten times, hundred times and divided by 10.

Lesson Objectives

- To understand how to express ten times and hundred times.

Prior Knowledge

- Numbers up to hundred thousand place
- Read and write numbers up to hundred thousand place.
- Understand the structure of large numbers.

Preparation

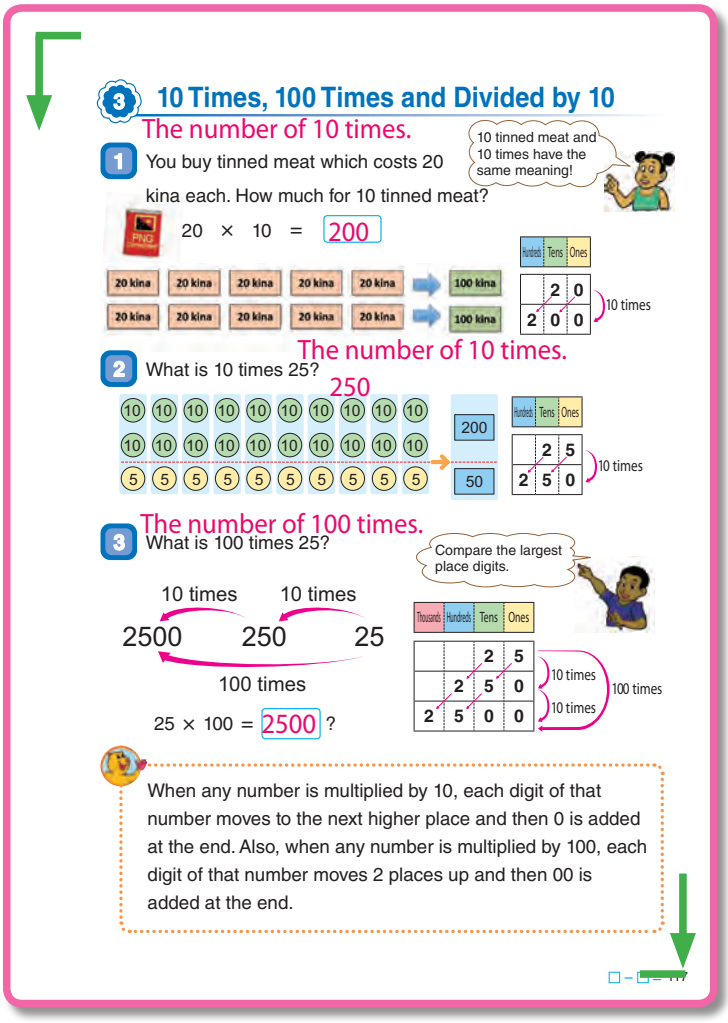
- Summary points ..... written on a chart.

Assessment

- Think about how to express numbers of ten times and hundred times. F
- Recognise how to express numbers of ten times and hundred times. S

• Teacher's Notes •

This lesson is the base of multiplication with 10,100 and divide by 10. Thus, it is important that students should be able to recognise and reason multiplying with 10 or zeros(00) to the right repectively.



3 10 Times, 100 Times and Divided by 10

The number of 10 times.

1 You buy tinned meat which costs 20 kina each. How much for 10 tinned meat?

10 tinned meat and 10 times have the same meaning!

20 × 10 = 200

20 kina 20 kina 20 kina 20 kina 20 kina → 100 kina
20 kina 20 kina 20 kina 20 kina 20 kina → 100 kina

Hundreds Tens Ones
2 0
2 0 0
10 times

The number of 10 times.

2 What is 10 times 25?

250

10 10 10 10 10 10 10 10 10 10
10 10 10 10 10 10 10 10 10 10
5 5 5 5 5 5 5 5 5 5
200
50

Hundreds Tens Ones
2 5
2 5 0
10 times

The number of 100 times.

3 What is 100 times 25?

Compare the largest place digits.

10 times 10 times
2500 250 25
100 times

25 × 100 = 2500 ?

Thousands Hundreds Tens Ones
2 5
2 5 0
2 5 0 0
10 times
10 times
100 times

When any number is multiplied by 10, each digit of that number moves to the next higher place and then 0 is added at the end. Also, when any number is multiplied by 100, each digit of that number moves 2 places up and then 00 is added at the end.

Lesson Flow

1 Review the previous lesson.

2 1 Think about the number of 10 times of 20 Kina based on the diagram shown in the text book.

S Recognise ten times of 10 becomes 100 and twenty times of 10 becomes 200.
T Let the students notice the vertical relationship of the place value chart.
T Introduce the main task.

3 2 Find the number which is ten times of 25 based on the diagram representations.

S Think of the number separating 20 and 5.
T Let the students notice the vertical relationship of 25 and 250 from the place value chart.
S Recognise that when a number becomes ten times, the number of digit increases by 1 place and 0 is added at the end.

4 3 Find the number which is hundred times of 25 based on the diagram representations.

T Let the students notice that hundred times means twice of ten times.
S Recognise the relationship between 25 and 2500.
S Recognise that when a number becomes hundred times, the number of digit increases 2 and two zeros are added at the end.

5 Conclude the lesson .

T Every number multiplied by 10 moves to the next higher place, and then a zero is added on at the end. Also, every number multiplied by 100 moves up 2 places, and then two zeros are added on at the end.

Sample Blackboard Plan

Date: Chapter 11: Large Numbers Topic: 10 times, 100 times and divided by 10 Lesson Number: 1 out of 2

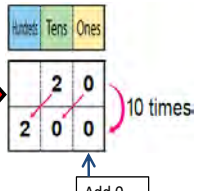
Main Task: Let's multiply numbers by 10 and 100.

1 What is 10 times of 20?

20 × 10 = ☐

MT

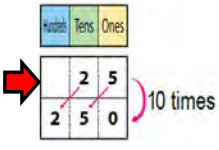
10 times
To multiply any number by 10, move all the numbers up to the next higher place and add a 0 to the right.



2 What is 10 times of 25?

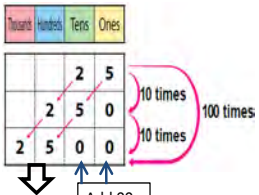
25 × 10 = ☐

10 times
To multiply any number by 10, move all the numbers up to the next higher place and add a 0 to the right.



3 What is 100 times of 25? 25 × 100 = ☐

100 times
To multiply any number by 100, move all the numbers up to the next higher place and add 00 to the right.



The cost of 100 times should be 10 times larger than the cost of 10×25 which is 250.

When any number is multiplied by 10, each digit of that number moves to the next higher place and then 0 is added at the end. Also, when any number is multiplied by 100, each digit of that number moves 2 places up and then 00 is added at the end.

Exercise

1 (1) What number is 10 times larger than 100?
(2) 40 × 10 (4) 150 × 10
(3) 53 × 10 (5) 2500 × 10

2 1) What number is 100 times larger than 100?
(2) 6 × 100 (4) 824 × 100
(3) 12 × 100 (5) 3500 × 100

Summary

- The math was interesting because any number moves up a place when multiplied by 10 and add a 0 to the right.
- Also any number moves up two places when multiplied by 100 and add 00 to the right.

Unit 11

Unit: Large Numbers
Sub-unit: 3. 10 Times, 100 Times and Divided by 10
Lesson 2 of 2 (Single Period)

Textbook Page : p.118
Actual Lesson 079

Lesson Objectives

- To understand how to express the number divided by 10.

Prior Knowledge

- The number of 10 and 100 times and divided by ten.

Preparation

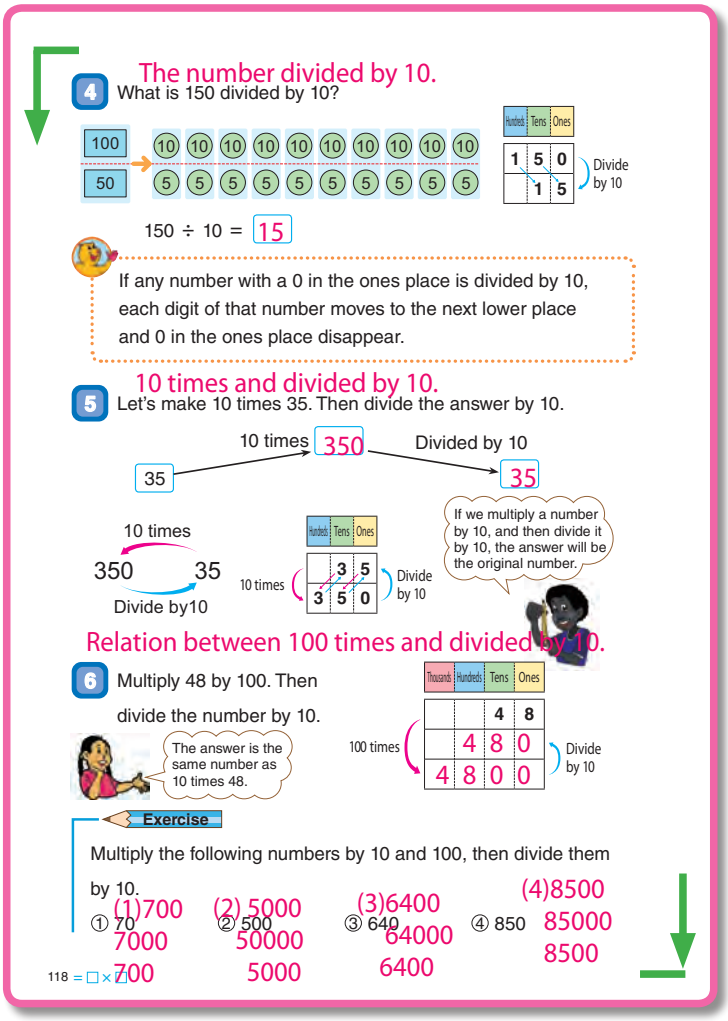
- Place value chart
- Chart on the summary points

Assessment

- Think about how to express the number divided by 10. F
- Solve exercise correctly at the end of the lesson. S

• Teacher's Notes •

The focus is to express dividend by 10 and recognising the relationship of 10 times and divided by 10.



4 The number divided by 10.
What is 150 divided by 10?

100 (10 10 10 10 10 10 10 10 10 10)
50 (5 5 5 5 5 5 5 5 5 5)

Hundreds	Tens	Ones
1	5	0
	1	5

Divide by 10

150 ÷ 10 = 15

If any number with a 0 in the ones place is divided by 10, each digit of that number moves to the next lower place and 0 in the ones place disappear.

5 10 times and divided by 10.
Let's make 10 times 35. Then divide the answer by 10.

35 → 10 times 350 → Divided by 10 → 35

10 times
350 35
Divide by10

10 times

Hundreds	Tens	Ones
3	5	
3	5	0

Divide by 10

If we multiply a number by 10, and then divide it by 10, the answer will be the original number.

Relation between 100 times and divided by 10.

6 Multiply 48 by 100. Then divide the number by 10.

The answer is the same number as 10 times 48.

100 times

Thousands	Hundreds	Tens	Ones
		4	8
	4	8	0
4	8	0	0

Divide by 10

Exercise

Multiply the following numbers by 10 and 100, then divide them by 10.

① 70 (1)700 7000
② 500 (2) 5000 50000
③ 640 (3)6400 64000 6400
④ 850 (4)8500 85000 8500

118 = □ × □ 700 5000

Lesson Flow

1 Review the previous lesson.

2 4 Investigate the number that 150 is divided by 10 based on the diagram representation.

T What is the difference when comparing the previous lesson?
S A number was multiplied by 10 and hundred last time and now it is divided.
S Notice the relationship between 150 and 15 from the place value chart.
T Introduce the main task.

3 Think about what happens when a number is divided by 10.

S Confirm that the digit of number is moved in the place value chart.

4 5 Investigate how the number changes when 35 is multiplied by 10 or divided by 10.

TN Explain using place value chart so that students can follow easily to understand the relationship.

5 6 Investigate how the number changes when 48 is multiplied by 100 or divided by 10.

S Confirm how 48 changes using the place value chart.
S Recognise with the place value chart if the number is multiplied by 100 and divided by 10, it becomes 10 times of the original number.

6 Solve exercises.

S Complete ① – ④.

Sample Blackboard Plan

Date: Chapter 11: Large Numbers Topic: 10 times, 100 times and divided by 10 Lesson Number: 2 out of 2

Main Task: Let's multiply by 10, 100 and divide numbers by 10.

4 What is 150 divided by 10?
150÷10 = ☐

10 times
To divide a number with 0 in the ones place by 10, move all the numbers down to the next lower place and drop the zero at the end where it will disappear in the ones place.

Hundreds	Tens	Ones
1	5	0
	1	5

Divide by 10

MT

5 Let's make 10 times 35? Then divide the answer by 10.

35 → 10 times 350 → Divided by 10 → 3 5

10 times
350 35
Divide by 10

10 times

Hundreds	Tens	Ones
	3	5
3	5	0

Divide by 10

10 times and divide by 10
When multiplying a number by 10 and then divide by 10 again, the answer becomes the original number.

6 Multiply 48 by 100. Then divide the number by 10.
48 × 100 = ☐ → ☐ ÷ 10 = ☐

Thousands	Hundreds	Tens	Ones
		4	8

100 times Divide by 10

100 times and divide by 10
When multiplying 48 by 100 and then you divide by 10, the answer becomes the same as 10 times 48.

Exercise

1 Multiply the following numbers by 10 and 100 then divide by 10.
(1) 70 (2) 500
(3) 640 (4) 850

Summary
■ The math was interesting because any number moves up a place when multiplied by 10 and down a place when divided by 10.

Unit 11

Unit: Large Numbers
Sub-unit: 4. Addition and Subtraction
Lesson 1 of 2 (Single Period)

Textbook Page : p.119
Actual Lesson 080

Sub-unit Objectives

- To calculate addition and subtraction of large number by applying the decimal positional numeration system.

Lesson Objectives

- To calculate addition and subtraction of large number by applying the decimal positional numeration system.

Prior Knowledge

- Numbers up to hundred thousands place
- Read and write numbers up to hundred thousand place.
- Understand the structure of the large numbers.

Preparation

- 2 sets of number cards 1 – 8

Assessment

- Enjoy the calculation of large numbers using the number card. F
- Recognise that the system of calculation is the same as the calculation of 3-digit numbers. S

• Teacher's Notes •

Task 2 may be challenging for some students, give them ample time to express their ideas.

(4-digit) + (4-digit), carrying from thousands place.

4 Addition and Subtraction

1 Let's add 7356 + 8421 in vertical form.

	7	3	5	6
+	8	4	2	1
1	5	7	7	7

In the thousands place, the answer is carried up, so how should we write?

Addition and subtraction of 4-digit number

2 Let's use cards with numbers 1 , 2 , 3 , 4 , 5 , 6 , 7 and 8 , for making addition and subtraction problems of 4-digit numbers.

Naiko's problem

	6	1	4	5
+	7	3	2	8
1	3	4	7	3

Ambai's problem

	4	8	1	2
−	3	5	7	6
1	2	3	6	

❶ Let's make an addition problem that has the largest answer.

In which case does the answer become largest?

It is largest when both thousands place are the largest!

❷ Let's make a subtraction problem that has the smallest answer.

(2) 5123
- 4876
247

Eg. (1) 8642 + 7531 = 16173 (1) 8641 + 7532 = 16173

Lesson Flow

1 Review the previous lesson.

2 ① Think about how to do addition of carrying from the thousands place.

T Confirm how to calculate using the structure of large numbers.
S Recognise 7356 + 8421 is the addition of carrying over to the thousands place.
S Understand that system of calculation is same as before, like carrying from thousands place to ten thousands place which is one digit greater.
T Introduce the main task.

3 ② Make calculation problem using number cards from 1 to 8.

T ① How can we make an addition which has the largest number?
S Try by themselves and discuss their ideas with friends.
T Let the students notice that thousands place of both numbers must be the largest number.
S Notice that thousands place should be 8 or 7, hundreds place should be 5 or 6 and ones place should be 1 or 2.
T ② To make a smallest number, the answer from the thousands place should be 0 after borrowing number from thousands place to hundreds place. In addition, the largest number must be subtracted from the rest of the numbers.

Sample Blackboard Plan

Date: Chapter 11: Large Numbers Topic: Addition and Subtraction Lesson Number: 2 out of 2

Main Task: Let's think about how to calculate 4 digit numbers.

1 Let's add these digits in vertical form.

	7	3	5	6
+	8	4	2	1
1	5	7	7	7

Notice that the addition is same as we learnt before, adding from ones place and adding numbers in the same place value.

MT

2 Let's use number cards from 1 to 8 to make addition and subtraction problems of 4 digits.

1	2	3	4	5	6	7	8

Naiko' problem

	6	1	4	5
+	7	3	2	8
1	3	4	7	3

Ambai's problem

	4	8	1	2
−	3	5	7	6
	1	3	3	6

1 Let's make an addition problem that has the largest answer.

	8	6	4	2
+	7	5	3	1
1	6	1	7	3

	8	6	4	1
+	7	5	3	2
1	6	1	7	3

2 Let's make an addition problem that has the smallest answer.

	5	1	2	3
−	4	8	7	6
		1	4	7

Exercise

1 Make one more
(1) addition problem with a large answer.
(2) Subtraction problem with a smaller answer.

Summary

- For a larger answer, order numbers from the largest to the smallest.
- For a smallest answer, between hundreds place and ones place put small number in the minuend and large numbers in the subtrahend except for the thousands place.
- Thousands place must be 0 after the calculation.

Unit 11

Unit: Large Numbers
Sub-unit: 4. Addition and Subtraction
Lesson 2 of 2 (Single Period)

Textbook Page : p.120
Actual Lesson 081

Lesson Objectives

- To calculate large numbers and expressing the number as a stack of 1000.
- To think about how to calculate addition with many digits.

Prior Knowledge

- Addition and subtraction of 4-digit numbers (Previous lesson)

Preparation

- Exercise written on a chart

Assessment

- Think about how to express large numbers in a simpler way. F
- Solve exercises at the end of the lesson. S

• Teacher's Notes •

Writing the term thousand to represent zeros makes calculation easier. Give opportunity for students to recognise and express numbers in a simpler way by themselves.

Addition of large number.

3 In 2011, the number of people in West Sepik Province was 248000. The number of people in East Sepik Province was 450000. How many people are there in the provinces of West and East Sepik altogether?

248000 is written as 248 thousand.

1 Write an expression.

248000 + 450000

2 Let's think about how to calculate.

248 thousand + 450 thousand = 698 thousand.

3 What is the difference in the number of people between the West Sepik Province and East Sepik Province?

450000 − 248000

450 thousand - 248 thousand
= 202 thousand

Assume 1 thousand people as one set, and then calculate. It is better to calculate by estimating sets of one thousand.

Exercise

① 4760 + 7071 11831 ② 5634 + 6509 12143

③ 8693 − 3587 5106 ④ 8606 − 8198 408

⑤ 210000 + 370000 580000 ⑥ 530000 − 180000 350000.

4 Addition of large number.

Let's add 187653 + 972784 in vertical form.

We use the same method even if there are more digits !

	1	8	7	6	5	3
+	9	7	2	7	8	4
1	1	6	0	4	3	7

This one calculation is the result of the following calculations.

$\begin{array}{r} 3 \\ +\,4 \\ \hline 7 \end{array}$ $\begin{array}{r} 5 \\ +\,8 \\ \hline 8 \end{array}$ $\begin{array}{r} 6 \\ +\,7 \\ \hline 1 \end{array}$

$\begin{array}{r} 7 \\ +\,2 \\ \hline 9 \end{array}$ $\begin{array}{r} 8 \\ +\,7 \\ \hline 1 \end{array}$ $\begin{array}{r} 1 \\ +\,9 \\ \hline 0 \end{array}$

120 = □ × □

Lesson Flow

1 Review the previous lesson.

T Introduce the main task.

2 ③ Addition of large number considering the number as a stack of 1000.

T ① Let the student find out that 248000 can be written as 248 thousand and 450000 can be written 450 thousand.
S Realise that 248000 + 450000 can be expressed 248 thousand + 450 thousand.
T ② How to calculate 248 thousand + 450 thousand?
S We can calculate 248 + 450 and add the word thousand after the numbers.
T ③ What is the difference of these two?
S 450 thousand - 248 thousand = 202 thousand

3 Complete the exercise.

4 ④ Addition of large numbers in vertical form.

T How to calculate 187653 + 972784 in vertical form?
S Use the same method of addition in vertical form.

5 Summarise by correcting the addition problem.

S Notice that even the digits increase the method of calculation is the same.

Sample Blackboard Plan

Date: Chapter 11: Large Numbers Topic: Addition and Subtraction Lesson Number: 2 out of 2

Main Task: Let's calculate larger numbers.

MT

③ Let's add larger numbers in various ways.

① Mathematics Expression
248000 + 450000

248 thousand 450 thousand

Remember previously you learnt that numbers such as 248000 can be written as 248 thousand

② Mathematics Expression
248 + 450 = 698

	2	4	8
+	4	5	0
	6	9	8

Answer: 698 thousand or 698000

③ Let's find the difference in the number of people.

Mathematics Expression
450000 − 248000

450 thousand 248 thousand

Mathematics Expression
450 −248 = 698

	4	5	10
−	2	4	8
	2	0	2

Answer: 202 thousand or 202000 .

Exercise

(1) 4760 + 7071 (3) 8693 − 3587
(5) 210000 + 370000 (6) 530000 − 180000

④ Let's add larger numbers in vertical form.

We use the same method even if there are more digits.

	1	11	18	17	16	5	3
+		9	7	2	7	8	4
	1	1	6	0	4	3	7

Summary
- To calculate easily such numbers as 450000 can be written as 450 thousand.
- When adding very large numbers, the same method is used even if there are more digits..

Unit 11

Unit: Large Numbers
Sub-unit: Exercise and Evaluation
Lesson 1 of 1 (Double Period)

Textbook Page : p.121-p.122
Actual Lesson 082

Sub-unit Objectives

- To deepen the understanding of what they have learned in this unit.

Lesson Objectives

- To deepen the understanding of what they have learned in this unit.

Prior Knowledge

- All contents in this unit

Assessment

- Enjoy solving exercises by deepening their understanding on what they have learned. F
- Confirm if they can solve problems correctly and mastered the contents. S

• Teacher's Notes •

Use 30 minutes for the exercise and give the evaluation test after that.

Exercise

Structure of large number

1 Write the following numbers in numerals. Page 109

① The number that is the sum of 2 sets of ten thousand and 180. 20180

② The number that is the sum of 7 sets of hundred thousand, 6 sets of ten thousand and 3 sets of thousand. 763000

③ The number that is the sum of 30 sets of ten thousand and 50 sets of hundred. 305000

Series of large number.

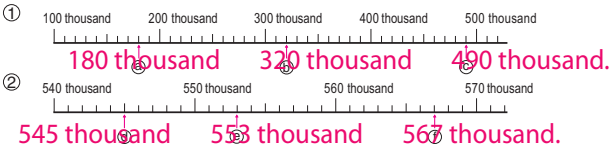
2 Fill in the ☐ with an appropriate number. Page 115

① 11000 — 11500 — 12000 — 12500 — 13000 — 13500

② 322 thousand — 324 thousand — 326 thousand — 328 thousand — 330 thousand — 332 thousand

3 Write the corresponding number in numerals to the one on the number line below. Pages 114~115

How to express numbers on the number line



Comparison of large number.

4 Fill in the ☐ with the appropriate inequality sign. Page 115

① 333300 > 34330 ② 5482941 > 5482899

Relationship between multiplied by 100 and divided by 10.

5 Multiply the following numbers by 100 and then divide by 10. Pages 117 ~ 118

① 23 230 ② 40 400 ③ 111 1110 ④ 605 6050

6 Let's calculate. Pages 119 ~ 120

① 3183 + 9897 13080 ② 6102 + 7938 14040 ③ 6997 − 5006 1991

□ + □ = 121 122 = □ − □

Problems

Structure of large number, how to write and read

1 Write the following numbers in numerals, and read them.

● Understanding the structure of large numbers and how to read them.

① The number that is the sum of 48 sets of ten thousand and 270. 480270 Four hundred, eighty thousand two hundred & seventy

② The number that is the sum of 5 sets of hundred thousand, 9 set of thousand and 2 sets of hundred. 509200 Five hundred, nine thousand two hundred

③ The number that is the sum of 2 sets of hundred thousand, 35 sets of thousand. 235000 Two hundred thirty five thousand

④ The number that is 10 sets of hundred thousand. 1000000 One million

2 Draw an arrow to the number line that corresponds to the numbers.

● Represent numbers on the number line.

① 2000 ② 18000 ③ 30000 ④ 45000

3 Fill in the ☐ with an appropriate number.

● Understanding how to arrange numbers in order.

① 19850 — 19900 — 19950 — 20000

② 19800 — 19900 — 20000 — 20100

③ 250 thousand — 200 — 150 — 100 thousand — 50 thousand

Lesson Flow

1 **① Write the numbers confirming the structure up to 100 thousand.**

T Ask to use place value chart for the students who have difficulty.

2 **② Understand the difference between 2 numbers.**

S Consider the difference of 2 numbers and find the missing numbers.

3 **③ Read and Write the numbers on the number line.**

S Consider size of one unit scale and find the number.

TN It is quite difficult for students to find the size of one unit scale so please explain to them.

4 **④ Compare numbers and express using inequality sign.**

T Confirm how to compare numbers and how to use the sign.

5 **⑤ Find numbers which are divided by 10 after multiplied by 100.**

TN Confirm following two points.

① How to find numbers which are multiplied by 100 or multiplied by 10.

② The number which are divided by 10 after multiplied by 100 is 10 times of original number.

6 **⑥ Calculate 4-digit numbers.**

7 **Problems**

S Complete ① – ③.

Large Numbers	Name:	Score

(Each question is worth 10 points)

1. Write the following numbers in numerals.

① Eighty seven thousand three hundred and thirty nine. 87339

② Fifty thousand and twenty three 50025

③ The number that is the sum of 1 set of one million, 6 sets of hundred thousand and 3 sets of ten thousand. 1630000

④ The number that is 10 times that of 5100. 51000

2. Compare the two numbers and write the appropriate inequality sign.

① 923718 < 923781 ② 104152 > 98769

3. Fill in the blanks with an appropriate number.

11000 – 11500 – 12000 – 12500 – 13000

4. Calculate the following operations.

① 3184 + 9998

$$\begin{array}{r} 3184 \\ +9998 \\ \hline 13182 \end{array}$$

② 6997 – 4003

$$\begin{array}{r} 6997 \\ -4003 \\ \hline 2994 \end{array}$$

End of Chapter Test: Chapter 11 **Date:**

Large Numbers	Name:	Score

(Each question is worth 10 points)

1. Write the following numbers in numerals.

   ① Eighty seven thousand three hundred and thirty nine. _____

   ② Fifty thousand and twenty three _____

   ③ The number that is the sum of 1 set of one million, 6 sets of hundred thousand and 3 sets of ten thousand.

   _____

   ④ The number that is 10 times that of 5100. _____

2. Compare the two numbers and write the appropriate inequality sign.

   ① 923718 _____ 923781 ② 104152 _____ 98769

3. Fill in the blanks with an appropriate number.

   11000 − _____ − 12000 − 12500 − _____

4. Calculate the following operations.

   ① 3184 + 9998 ② 6997−4003

Chapter 12 Length

1. Unit Objectives

- To deepen the understanding about length. (3.2.1 a)
- To know about the unit of length (kilometre). (3.2.1 b)
- To calculate length correctly (3.2.1 c and d)

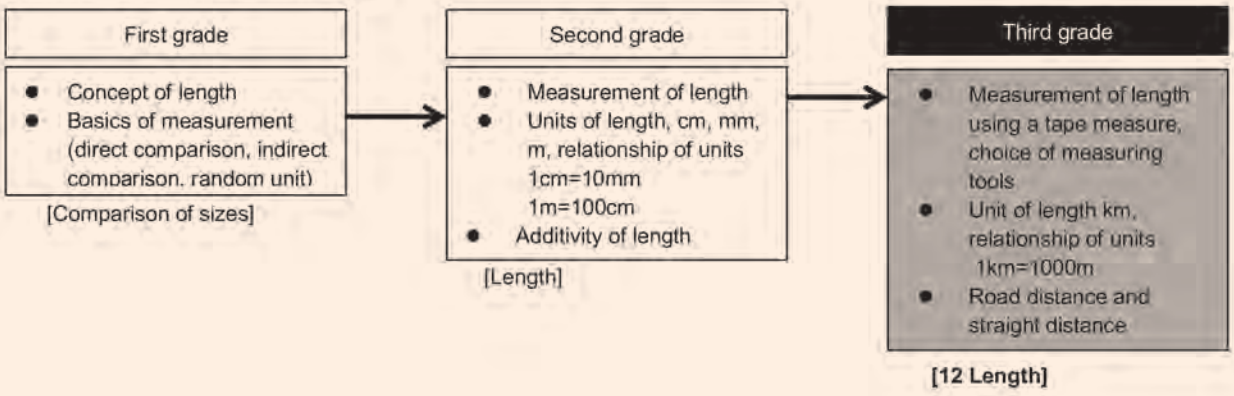
2. Teaching Overview

In the learning of quantity, it is important for learners to acquire sense of quantity. For example, students should be encouraged to be able to estimate and have a feel of how much is 1 m, 10 kg or 1 hour like. In the learning of length, several practices of estimating and measuring to confirm if the estimation is correct or not will help learners to acquire the sense of length. Students learned measuring properties with a ruler by 1 time in Grade 2. In this chapter, it will be the last chapter for students to learn about length and distance in school, so that teachers should be responsible for perfecting students' knowledge and skills on length and distance. The learning in this chapter will be the foundations of learning areas.

How to Measure : Students should find the difference of properties of rulers and measuring tapes. At the same time, students should understand that they can measure both visible lines and invisible straight lines which connects 2 points. They should find out the appropriate apparatuses for measuring through experiences and discussions.

Kilometre : It is important for students to acquire the sense of km. Discussion on distance from school to a certain place, the town centre, next town, famous cities, etc will help students to have the sense if they are in walkable distance or far compared to metres or centimetres.

3. Related Learning Contents



Unit 12

Unit: Length
Sub-unit: 1. How to Measure
Lesson 1 of 2 (Double Period)

Textbook Page : p.123-p.125
Actual Lesson 083

Sub-unit Objectives

- To understand how to use measuring tools and measure the length.
- To get the sense of length through measuring things. (how far or long the distance is)

Lesson Objectives

- To know the measuring tools for measuring long distance or length.
- To understand how to use the measuring tools.
- To understand the meaning of distance.

Prior Knowledge

- Measuring tools that measure distances less than a metre and up to a metre.
- How to use the 1 metre ruler.

Preparation

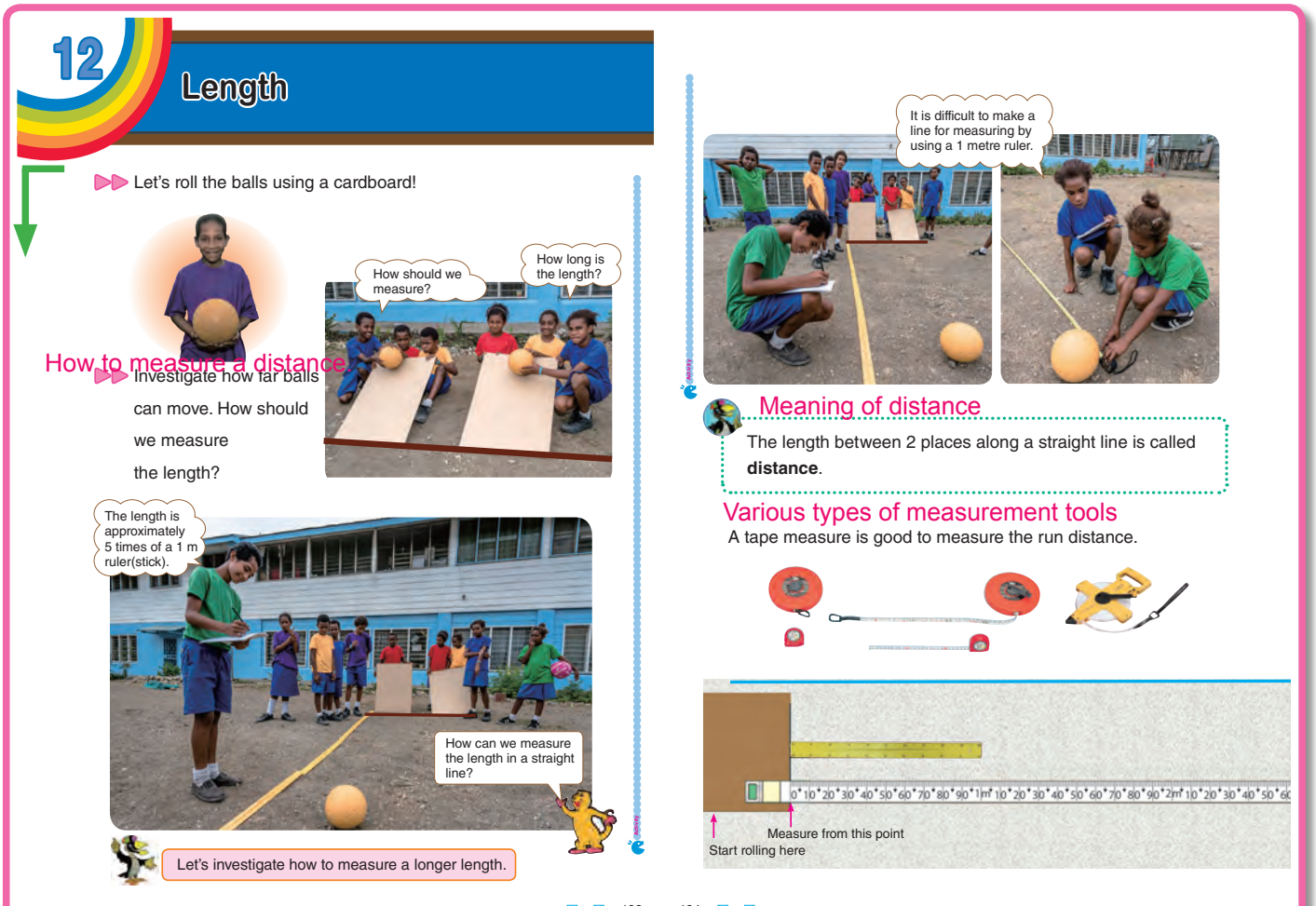
- Tape measure, 1 metre ruler.

Assessment

- Enjoy how to measure long distances accurately using measuring tools. F
- Understand the meaning of distance. S

• Teacher's Notes •

If there are any examples of different tape measure, bring into class to enhance learning.



Lesson Flow

1 Think about how to measure the distance accurately after rolling the ball.

T Make groups and each group should have a ball. Each group rolls the ball and then compares the distances.

S Try to understand the task and discuss how they can compare the distances. How far did the ball move? How long is the length of the distance? How should we measure? What kind of measuring tool can we use to measure?

T Introduce the main task.

2 1 Confirm how to use the tape measure and how to read the unit by answering activities 1 to 3.

T Have the students go through answering the questions in the text book in order to understand how to use and read off the unit shown on a tape measure.

3 Measure the distance of the ball using the tape measure.

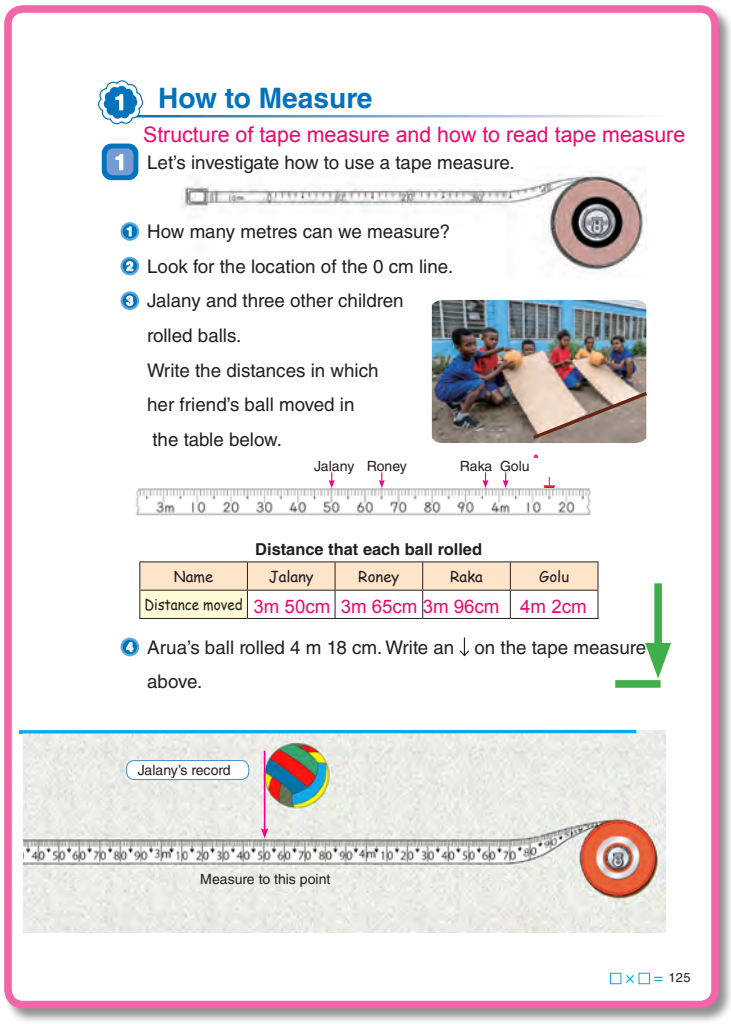
S Go out to the school ground and do the activity.

T Ask students to investigate how to measure a longer length.

S Discuss that by using a measuring tool like a 1 metre ruler and connecting the 1 metre ruler each time, we can measure a longer length.

S Realise that even when they measure using a 1 metre ruler, there is still a problem so they need another measuring tool.

T A tape measure that can measure a distance longer than one metre because a metre ruler is ok, however, you have to mark and then connect each time where it is difficult and the measurement may not be accurate as expected. A one metre ruler can only measure distances up to 1 metre or less than that.



1 How to Measure

Structure of tape measure and how to read tape measure

1 Let's investigate how to use a tape measure.

1 How many metres can we measure?

2 Look for the location of the 0 cm line.

3 Jalany and three other children rolled balls. Write the distances in which her friend's ball moved in the table below.

Jalany Roney Raka Golu

3m 10 20 30 40 50 60 70 80 90 4m 10 20

Distance that each ball rolled

Name	Jalany	Roney	Raka	Golu
Distance moved	3m 50cm	3m 65cm	3m 96cm	4m 2cm

4 Arua's ball rolled 4 m 18 cm. Write an ↓ on the tape measure above.

Jalany's record

Measure to this point

□×□= 125

Sample Blackboard Plan

Sample blackboard plan refer to page 187

Unit 12

Unit: Length
Sub-unit: 1. How to Measure
Lesson 2 of 2 (Single period)

Textbook Page : p.126
Actual Lesson 084

Lesson Objectives

- To measure the distances accurately using the tape measure.
- To understand the sense of a distance about 10 metres through walking.
- To acquire the sense of distance by predicting and measuring the distance in the surrounding area.
- To measure the distance between various things in the surrounding area accurately.

Prior Knowledge

- Measuring tools for measuring long distance or length.
- How to use the measuring tools.
- Measuring the distance accurately using ruler and tape measure.

Preparation

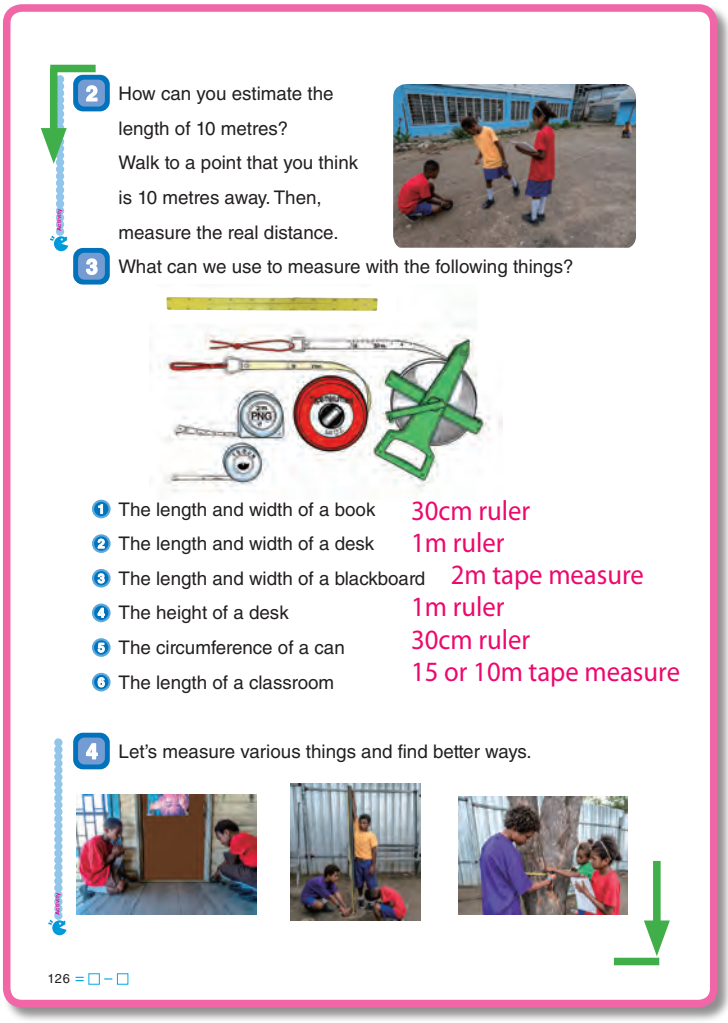
- Tape measure, 1 metre ruler

Assessment

- Enjoy measuring the distances of various things accurately using the measuring tools. F
- Think about the appropriate measuring tools depending on the length. S
- Measure the distances of various things accurately. S

• Teacher's Notes •

Prediction is an important process of learning. Assist students using the table to predict before measuring using the measuring tool. Task 2 and task 4 are outdoor activities.



2 How can you estimate the length of 10 metres? Walk to a point that you think is 10 metres away. Then, measure the real distance.

3 What can we use to measure with the following things?

1 The length and width of a book — 30cm ruler
2 The length and width of a desk — 1m ruler
3 The length and width of a blackboard — 2m tape measure
4 The height of a desk — 1m ruler
5 The circumference of a can — 30cm ruler
6 The length of a classroom — 15 or 10m tape measure

4 Let's measure various things and find better ways.

126 = □ − □

Lesson Flow

1 2 Play the game of guessing 10 metres.

S Make a group and a member of the group guess and walk a distance of 10 metres and compare the distance and measure the distance. Through the game they understand the sense of distance.

T Once students understand the 10 m distance let them walk 10 m many times for improving their sense of distance.

T Introduce the main task.

2 3 Choose the measuring tool depending on the objects to measure.

S Predict the length of each object before choosing the measuring tool.

T Let students share their ideas with reasons.

3 4 Make plan for measuring various things.

S In groups they decide 3 things to measure within their surrounding area.

S Predict the distance before measuring.

S Decide which measuring tool to use.

S In groups, they go out to measure and record the distance of 3 things.

S Share the results and findings.

S Discuss the way for measuring accurately.

T Zero must be the starting point and should not be moved while measuring.
Measurement should be from 0 to where the measurement ends.

Sample Blackboard Plan (Lesson 83)

Date: Chapter 12: Length Topic: How to Measure Lesson Number: 1 out of 2

Main Task: Let's think about how to measure longer lengths.

Let's think about how the length is measured. Compare the distances (Use a 1m ruler)


Distance A


Distance B

4 times of a 1m ruler

5 times of a 1m ruler

Discover Problems

1.To connect 1m ruler may not be accurate.
2.It's difficult to make a straight line to measure.
3.They realize that they need a longer ruler or tape that can measure a length more than 1m.

Important Point

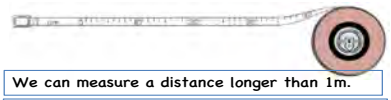
The length between 2 places along a straight line is called **distance**.

MT

4. Introduce various types of tools to measure longer length than 1m and more called **tape measures.**

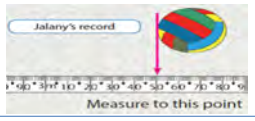
1 Go through the structure of tape and how to read the tape.

1. From where do you start rolling the tape measure.
2. From which point do you start to measure the distance and read off.



1 We can measure a distance longer than 1m.

2 Mark the location of 0cm on the line or tape measure.

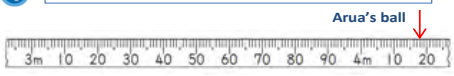


3 Measured distance of balls rolled using the tape measure.

Distance that each ball rolled

Name	Jalany	Rodney	Raka	Golu
Distance moved	3m 50cm	3m 65cm	3m 96cm	4m 2cm

4 Mark with an arrow how far the ball rolled.



Summary
- Measuring a distance longer than 1m with a ruler may not be accurate..
- A tape measure is needed to measure lengths longer than 1m.
- Mark the location of 0cm and start to measure the distance from that point to the measured point.

Sample Blackboard Plan (Lesson 84)

Date: Chapter 12: Length Topic: How to Measure Lesson Number: 2 out of 2

Main Task: Let's identify correct tools and measure various lengths.

Let's think about how to estimate the length of 10m.

2 1. Play the game of guessing 10m in length.

2. Each group member walk a distance of 10m and compare.
3. Measure real length using a tape.

MT

3 Choose the measurement tool depending on the object to measure.

1 The length and width of a book. (30 cm ruler)

2 The length and width of a desk. (100cm or 1m ruler)

3 The length and width of a blackboard. (2m tape measure)

4 The height of a desk.(100 cm or 1m ruler)

5 The circumference of a can. (100 cm or 1m tape measure)

6 The length of a classroom.(5m or 10m tape measure

Task: Let's make a plan for measuring various things.

4 Measure things and find better ways.

Predict the length, choose the tool and measure the real length.

Things in the surrounding area.	Predict length	Suggest measuring tool	Accurate distance
1.			
2.			
3.			

Summary
- To measure accurately 0 must be the starting point and should not be moved while measuring to where the measurement ends.
- There are proper measurement tools to use depending on the object to measure.

For example.
The length and width of a door. (2m tape measure)

Unit 12

Unit: Length
Sub-unit: 2. Kilometre
Lesson 1 of 3 (Double Period)

Textbook Page : p.127~p.128
Actual Lesson 085

Sub-unit Objectives

- To understand the meaning of distance and road distance.
- To get the sense of length through measuring things. (how far or long the distance is)
- To calculate the distance.

Lesson Objectives

- To understand the meaning of distance and road distance.
- To know about the relationship between kilometre and metre and use appropriate unit depending on the distance to measure.
- To calculate the distance accurately.

Prior Knowledge

- How to measure distance (m).

Preparation

- Chart of task 1 and 2

Assessment

- Think about how to calculate the distance and road distance using appropriate unit. F
- Understand the unit km and the relationship between kilometre and metre S.

• Teacher's Notes •

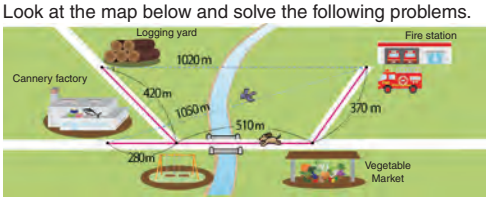
Unit of length
1000 m = 1 km

- Direct distance is measuring length in a straight line.
- Road distance is distance along the road.

2 Kilometre

The meaning of road distance and the difference between road distance and distance

1 Look at the map below and solve the following problems.



The length measured along the road is called **road distance.**

(1) How long is the road distance and the distance from the fire station to the Tuna cannery factory in metres, respectively?

Distance is the length measured in a straight line.

Road distance is 370+510+280= 1160m

Distance is 1050m

1000 m is called one kilometre and is written as 1 km.

1 km = 1000 m

(2) How many kilometres and metres are the road distance and the distance from fire station to Tuna cannery factory respectively?

Road distance 1160 m = 1 km 160 m

Distance 1050 m = 1 km 50 m

1 km 160 m is called "**one kilometre and one hundred sixty metres**".

(3) How many kilometres and metres are the road distance and the distance from the fire station to logging yard, respectively?

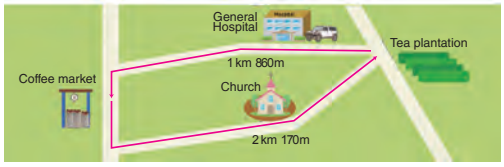
Road distance is 370 + 510 + 420 =1300m/ 1km 300m

Distance is 1020/ 1km 20m

□ + □ = 127 128 = □ − □

2 Calculation of the distance

Look at the map below and solve the following problems.



Students from Blue class visited town for the excursion.
Move from tea plantation to coffee market.

(1) How many kilometres and metres is the road distance from the tea plantation to the coffee market through the General hospital and return from the coffee market to the tea plantation through the church? Write an expression.

1 km 860 m + 2 km 170 m

Let's think about how to calculate.

Mero's idea

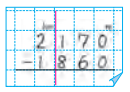
Kilometre
1 km + 2 km = 3 km
Meter
860 m + 170 m = 1030 m
1030 m = 1 km 30 m
Total, 4 km 30 m

Yamo's idea

1 km 860 m = 1860 m
2 km 170 m = 2170 m
So,
1860 m + 2170 m = 4030 m
4030 m = 4 km 30 m

(2) Between the tea plantation and the coffee market, which road distance is longer and by how many more?

Calculate the Length in Vertical Form



2km 170m − 1km 860m = 310m

Lesson Flow

1 **1 Think about the ways distance is measured.**

T A bird flies directly from the fire station to Cannery factory. What is it called?
S It is called direct distance.
T A dog runs along the road to Cannery factory. What is it called?
S It is called road distance.
T Emphasis the important point in the box .

2 **1 Confirm the difference of the road distance and direct distance between the fire station and the Cannery factory.**

T Direct distance is the measure of length in a straight line.
T Road distance is the distance along the road.
S Study the map and find the road distance and direct distance between the fire station and Cannery factory in metres only.
T Introduce the main task.

3 **2 Know the unit of kilometre and think about the relationship with metre.**

S Understand that 1000 m=1 km, and find the road distance and the direct distance in kilometres and metres by using a place value chart for the unit of length shown in activity 2.

4 **3 Think about how to calculate the distance.**

S Study the map and calculate the road distance and direct distance between the fire station and Cannery factory.

5 **2 Solve the task by comparing the two ideas.**

T What do we have to consider when calculating distance or road distance?
S We can use the unit 'km' if it is over 1000 m.
S For the calculation, when carrying, carry 1000 to 'km' place. When borrowing, borrow 1000 from 'km's place.
S 1 2 Solve the activities.

Sample Blackboard Plan

Date: Chapter 12: Length Topic: Kilometre Lesson Number: 1 out of 3

Main Task: Let's calculate road distance and direct distance in metres and kilometres.

1 Let's identify the road distance and direct distance in metres.

1 The road distance and the direct distance from the fire station to the Cannery factory.
Road distance: 370+510+280=1160
Direct distance: 1050m

MT

Important Point
1000 m is called one kilometer and is written as 1 km. 1 km = 1000 m

2 Road distance: 1160m = 1 km 160 m
Direct distance: 1050m = 1 km 050 m

km	m
1	1 6 0
1	0 5 0

1 km 160 m is read as "1 kilometre 1 hundred sixty metres."

3 The road distance and the direct distance from the fire station to the Logging yard.
Road distance: 370+510+420=1300m
1300m = 1 km 300 m
Direct distance: 1020m
1020m= 1 km 020 m

2 Task: Let's think about how to calculate the distance.

1 Move from tea plantation to coffee market

Mathematics Expression
1 km 860 m – 2km 170 m

km	m
1	8 6 0
+ 1 2	1 1 7 0
4	0 3 0

2 Between tea plantation and coffee market.

Mathematics Expression
2 km 170 m – 1km 860 m

km	m
1 2	1 1 7 0
– 1	8 6 0
	3 1 0

Summary

- 1000 metres is equal to 1 kilometre and written as 1km.
  1km160m is read as " 1 kilometre , 1 hundred sixty metres."
- Road distance is the distance along the road.
- Direct distance is the measure of length in a straight line.

Unit 12

Unit: Length
Sub-unit: 2. Kilometre
Lesson 2 of 3 (Double Period)

Textbook Page : p.129
Actual Lesson 086

Lesson Objectives

- To experience how long 1 kilometre is through walking 100 m distance.
- To understand how far you can go in one (1) kilometre.

Prior Knowledge

- Meaning of distance and road distance.
- Unit of kilometre and metre
- Calculation of distance

Preparation

- Mark the specific area for students to walk around including start and finish point for 100 m and 1 km.
- Identify the number of laps for 1 km around the sports field.

Assessment

- Experience and feel how long is one (1) kilometre and enjoy how to measure the distance by walking 100 m distance and counting the steps. F
- Understand the distance of (1) kilometre through the experiment. S

• Teacher's Notes •

The activity in this lesson is for enhancing their sense of length. It is important that students walk 1 km and relate the distance to their enviroment.

Teacher needs to measure 100 m and 1 km on the playground before the lesson.

Improve sense of distance

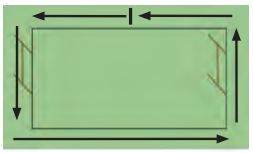
3 Let's explore the distance of 1 km around the sport field.

1 Walk for 100 m and think about how far is 1 km.

- How many of your steps did you take to walk 100 m?
- How many steps for 1 km?

2 Let's walk 1 km.

- How many minutes does it take?
- How do you feel?



3 Let's relate the distance of 1 km in our environment.

□ × □ = 129

Lesson Flow

1 (3) (1) Investigate the distance of 100 m in the school field.

T Introduce the main task.
TN The acitvity is an outdoor activity. Teacher can take students to the sports field.
T Indicate the distance of 100 m.
S Walking 100 metre by counting the number of steps.
T How many steps did you take to walk for 100 m?
S 200 steps, 215 steps, etc.
T How many steps for 1 km?
S Predict the number of steps.
1 km is 10 times of 100 m so we can multiply 10 to the number of steps for 100 m.

2 (2) Experiment, each student walks one (1) kilometre and record the result.

T Indicate how many laps for 1 km in your school field.
S Walk 1 km by measuring the time.

3 (3) Share the result in the class.

T How did you feel about walking 1 km?
S Longer than I expected.
S It was not so long for me.
T Compare their predictions and state whether it is the same as they predicted or not.
T Let's relate the distance of 1 km in our environment.
S 1 km is about the school to my house.
S From the market to my house is about 1 km.

Sample Blackboard Plan

Date: Chapter 12: Length Topic: Kilometre Lesson Number: 2 out of 3

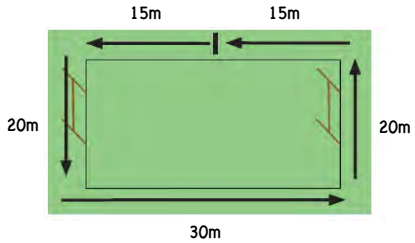
Main Task: Let's get a feel of walking a distance of 1 km.

MT

(3) Let's find the distance of a kilometre.

TN: Mark out the field to 100m before the lesson.

(1) Let's walk for 100m and and think about how far is 1km.



(2) Fill in the prediction part before experiment

Activity	Prediction	Record of result
1. Up to how many steps can you take to walk for 100m?	steps	steps
2. How long will it take to walk for 100m?	mins	mins
3. Walk a distance of 1 km, how many complete laps can we make?	laps	laps
4. How many minutes will it take to walk for 1 km?	mins	mins
5. My thought about the distance of 1km.	before	after

TN: Record how long it takes using a stop watch.

(3) Relate the distance to 1 km in our environment.

Summary
- 1 lap covers 100m.
- 10 laps covers 100 ×10 of which is 1000m
- 1000m is 1 km.
- It's a very long distance and very tiring.

Unit 12

Unit: Length
Sub-unit: 2. Kilometre
Lesson 3 of 3 (Single Period)

Textbook Page : p.130
Actual Lesson 087

Lesson Objectives

- To think about the effective route by combining the road distance and time.

Prior Knowledge

- Distance and road distance
- Unit of km and conversion between km and m

Preparation

- Worksheets, maps

Assessment

- Think about taking the effective route by combining road distance and time. F
- Find the effective route correctly by calculating road distance and time. S

• Teacher's Notes •

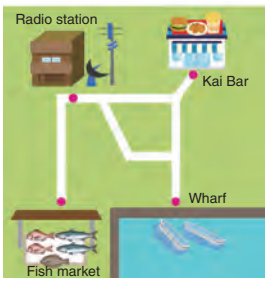
Considering distance and time, students find the fastest route.

Direct students attention to the map when explaining activites 1 to 3.

Apply the distance and time to our daily life's situations

Travelling by bicycle

4 Tanya is touring a sea side town by bicycle. She departs from the Kai Bar, visits both the Radio station and the Wharf and finally arrives at the fish market.



Road Distance and Time

	Road distance	Time
Kai bar ↔ Radio station	2 km 400 m	16 minutes
Kai bar ↔Wharf	6 km 100 m	28 minutes
Radio station ↔ Wharf	6 km 200 m	31 minutes
Radio station ↔ Fish market	19 km 100 m	48 minutes

1 The table above shows the road distance and travel time between 2 places. Which is better to go to first, is it the Radio station or the Wharf? Wharf

2 Which is the longest road distance, is it when she goes to the Radio station first or the wharf, and by how many?

3 Which takes a longer time by bicycle, and by how long?

130 = □ – □

(2) Answer
Radio station is 2km 400m + 6km 200m + 6km 200m + 19km 100m = 33km 900m
Wharf is 6km 100m + 6km 200m + 19km 100m = 31km 400m
33km900-31km400= 2km500m
To Radio station first 2km 500m more

(3) Answer
Radio station 16m + 31 + 31 + 48 = 126 minutes
Wharf 28 + 31 + 48 = 107 minutes
126 minutes - 107 minutes=19 minutes
To Radio first 19 minutes more

Lesson Flow

1 4 Read the problem and understand the task and what the map is showing.

S Discuss the situation in the problem and recognise what the map shows. Give some reasons as to why the map is useful to Tanya.

S Start travelling from the kai bar and visiting both the radio station and the wharf and finally arriving at the fish market.

T Introduce the main task.

2 Solve the problem of 1 - 3.

S Think about the road distance and travel time between each points or locations.

TN Let students discuss and come up with the closest and fastest way based on the information on the map and the table.

T Which is the closest and fastest way to go to the fish market?

S Write the road distance and the travel time on the map to help you think of the distance.

3 Summarise the lesson.

S Share their ideas in the class.

S Confirm the answer by explaining their reasons.

Sample Blackboard Plan

Date: Chapter 12: Length Topic: Kilometre Lesson Number: 3 out of 3

MT

Main Task: Let's find the shortest trip.

4 Let's think about which place is better to go to first.

1 Radio station

Math Expression

2km400m + 6km200m + 6km200m +19km100m

Vertical form

	km		m	
	2	4	0	0
	6	2	0	0
	6	2	0	0
+	21	9	1	0	0
	33	9	0	0

Ans: 33km 900m

Wharf

Math Expression

6km100m + 6km200m + 6km200m + 19km100m

Vertical form

	km		m	
	6	1	0	0
	6	2	0	0
+	21	9	1	0	0
	31	4	0	0

Ans: 31km 400m

Ans: It's better to go to the wharf first because it's a shorter road distance than the other.

2 Mathematics Expression

33 km 900 m − 31km 400 m

Vertical form

	km		m	
	33	9	0	0
−	31	4	0	0
	2	5	0	0

Ans: 2km 500m

Ans: It's longer to go to the radio station first because it's 2km 500m more in road distance.

3 Which takes a longer time by bicycle and by many?

Time in minutes

To the Radio station

Math Expression

16 + 31 + 31+ 48 = 126

Ans: 126 minutes

To the Wharf

Math Expression

28 + 31 + 48 = 107

Ans: 107 minutes

Takes longer by bicycle

Mathematics Expression

126 − 107= 19

Ans: 19 minutes more

Ans: It takes longer to go to the radio station first than the wharf because it takes 19 minutes more to get there.

Summary

- We can find the shortest and longest route using distance and time.

Unit: Length

Sub-unit: Exercise and Evaluation

Lesson 1 of 1 (Double period)

Textbook Page : p.131~p.132
Actual Lesson 088

Lesson Objectives

- To deepen the understanding of what has been learned by solving the exercises.

Assessment

- Review what has been learned by solving the exercises. F S

Prior Knowledge

- All contents in this unit

Preparation

- Evaluation sheet for the students

• Teacher's Notes •

Use 30 minutes for the exercise and give the evaluation test after that.

Exercise

Relationship between distance and road distance and change unit

1 Let's fill in the [ ] with a number or a word. Pages 124, 127

① Choose 2 places and measure the length in a straight line. This is called [Distance]

② The distance measured along the road is called [Road] distance

③ 1 km = [1000] m

How to read the unit of tape measure

2 How many metres and centimetres are shown by the arrows ↓ on the tape measures shown below. Page 125

10m 5cm　10m 48cm　10m 93cm

7m 7cm　7m 56cm　8m 19cm

Calculation of distance

3 The map below shows the road distance and the distance between Ansley's house and the school. Page 130

① How many kilometres and metres is the road distance from Ansley's house to the school through the park?

(1) Answer From Ansley's house to school
580m + 640m = 1220m/ 1km 220m

② What is the difference in metres between the road distance ① and the distance from Ansley's house to the school?

(2) Answer 1220m – 980m = 240m

Let's find time and duration. Grade 3 Do you remember?

① What time is 45 minutes after 10:40 in the morning? 11:25

② What is the duration from 11 hours and 30 minutes in the morning to 1 hour and 30 minutes in the afternoon? 11:30 to 1:30 =2 hours

□ − □ = 131

Problems

Appropriate unit of distance

1 Fill in the [ ] with a correct unit.
● Using units of length correctly.

① The length of the classroom is 8 [m].

② The road distance that we walk in one hour is 4 [km].

③ The height of the desk is 60 [cm].

④ The height of Mt. Wilhelm is 4509 [m].

How to read the tape measure

2 How many metres and centimetres are there at the arrows ↓ on the tape measure?
● Reading the scale of a tape measure.

① 16m 84cm　② 16m99cm　③ 17m 6cm　④ 17m18cm　⑤ 17m23cm

Compare the distance

3 Which is longer?
● Understanding relationship between different units of length.

① 2 km 50 m ; 2030 m　2km50m

② 1580 m ; 1 km 59 m　1580m

③ 5 km ; 4980 m　5km

Calculation of distance

4 Let's calculate.

① 700 m + 500 m =1200m

② 1 km 900 m + 200 m = 2km100m

③ 5 km 400 m + 680 m =6km80m

④ 1 km − 300 m =700m

⑤ 2 km 500 m − 800 m = 1km 700m

⑥ 3 km 530 m − 540 m =2km990m

5 Taleo can go to school through Thelma's house or Hona's house. Which of the 2 has the longest road distance? And by how much?

From Taleo through Thelma's house 450 m + 800m =1250m
From Taleo through Hona's house
770m + 500m =1270m , 1270m - 1250m =20m

132 = □ + □

Lesson Flow

1 ① **Fill in the boxes with a number or a word.**

S Recognise the relationship between the road distance and the direct distance.

2 ② **Confirm how to use the tape measure and how to read the unit by answering the questions.**

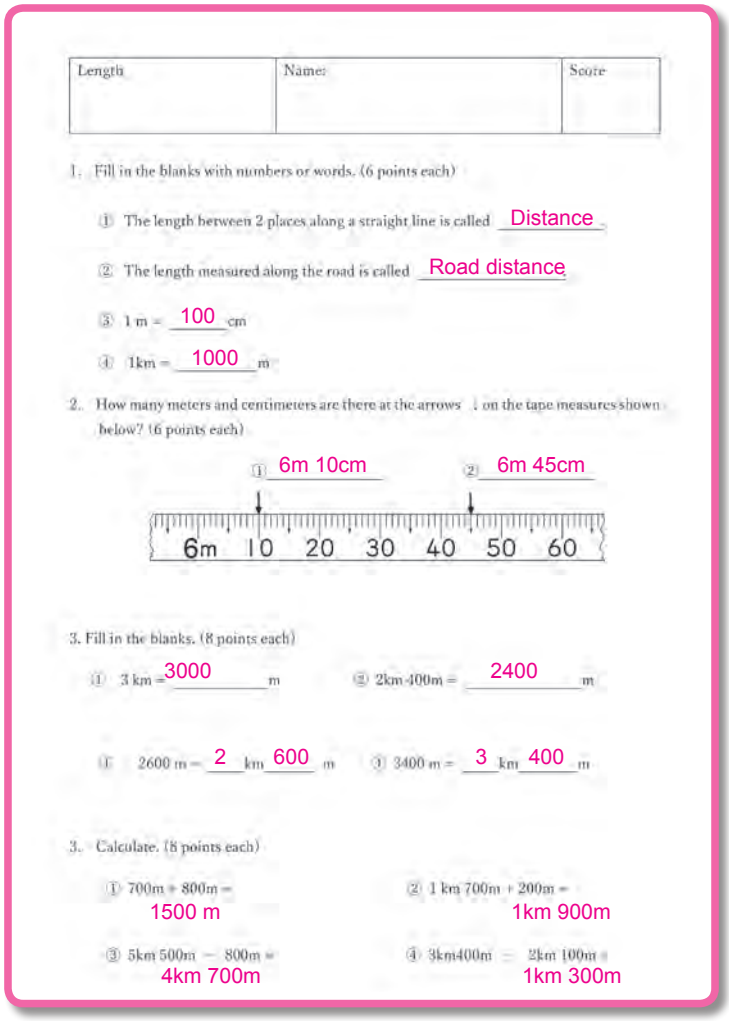
S Study how to read the tape measure and read off the measurements shown by the arrow on the tape measure.

3 ③ **Confirm the road distance and direct distance between Ansley's house and the school.**

S Study the map and identify the road distance and direct distance from Ansley's house to the school.

S Think about how to find the difference between the road distance and the direct distance.

4 ① **Fill in the boxes with a number or a word.**



Length | Name: | Score

1. Fill in the blanks with numbers or words. (6 points each)

① The length between 2 places along a straight line is called Distance

② The length measured along the road is called Road distance

③ 1 m = 100 cm

④ 1km = 1000 m

2. How many meters and centimeters are there at the arrows ↓ on the tape measures shown below? (6 points each)

① 6m 10cm ② 6m 45cm

6m 10 20 30 40 50 60

3. Fill in the blanks. (8 points each)

① 3 km = 3000 m ② 2km 400m = 2400 m

① 2600 m = 2 km 600 m ② 3400 m = 3 km 400 m

3. Calculate. (8 points each)

① 700m + 800m = 1500 m ② 1 km 700m + 200m = 1km 900m

③ 5km 500m − 800m = 4km 700m ④ 3km400m − 2km 100m = 1km 300m

S Think about the unit of distance or height around us by using the experience of measuring and the sense of distance.

5 ② **Confirm how to use the tape measure and how to read the unit by answering the questions.**

S Think about how to read the tape measure and read off the measurements shown by the arrow on the tape measure.

6 ③ **Compare the distances.**

S Compare the two distances while thinking about the relationship of the unit.

T Let students confirm to make same unit before the comparison.

7 ④ **Conduct distance calculation.**

S Conduct distance calculation.

T Let students confirm to make same unit before the calculation.

8 ⑤ **Confirm the road distance and direct distance between Thelma's house and the school.**

S Study the map and identify the road distance and direct distance from Thelma's house to the school.

S Think about how to find the difference between the road distance and the direct distance.

End of Chapter Test: Chapter 12 **Date:**

Length	Name:	Score

1. Fill in the blanks with numbers or words. (6 points each)

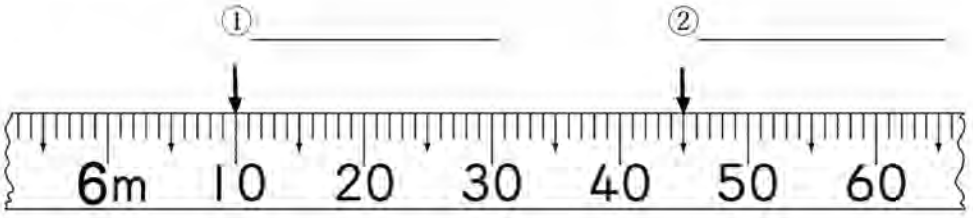
① The length between 2 places along a straight line is called _____.

② The length measured along the road is called _____.

③ 1 m = _____cm

④ 1km = _____m

2. How many meters and centimeters are there at the arrows ↓ on the tape measures shown below? (6 points each)



3. Fill in the blanks. (8 points each)

① 3 km = _____m ② 2km 400m = _____m

④ 2600 m = _____km_____ m ④ 3400 m = _____km_____m

3. Calculate. (8 points each)

① 700m + 800m = ② 1 km 700m + 200m =

③ 5km 500m − 800m = ④ 3km400m − 2km 100m =

Chapter 13 Triangles

1. Unit Objectives

- To understand the elements to make a triangle through observation or manipulation through the activity. (3.3.1a)
- To know about Isosceles and Equilateral triangles. (3.3.1b)
- To design patterns using various types of triangles. (3.3.1c)

2. Teaching Overview

Students learn shapes in intuitive ways in Grade 1. Based on the learning in Grade 1. They expand and develop the concepts of shapes with the notation of right angles by learning the concepts of rectangles, squares and right-angled triangles in Grade 2. In Grade 3, they learn isosceles triangles and equilateral triangles by focusing on the lengths of sides.

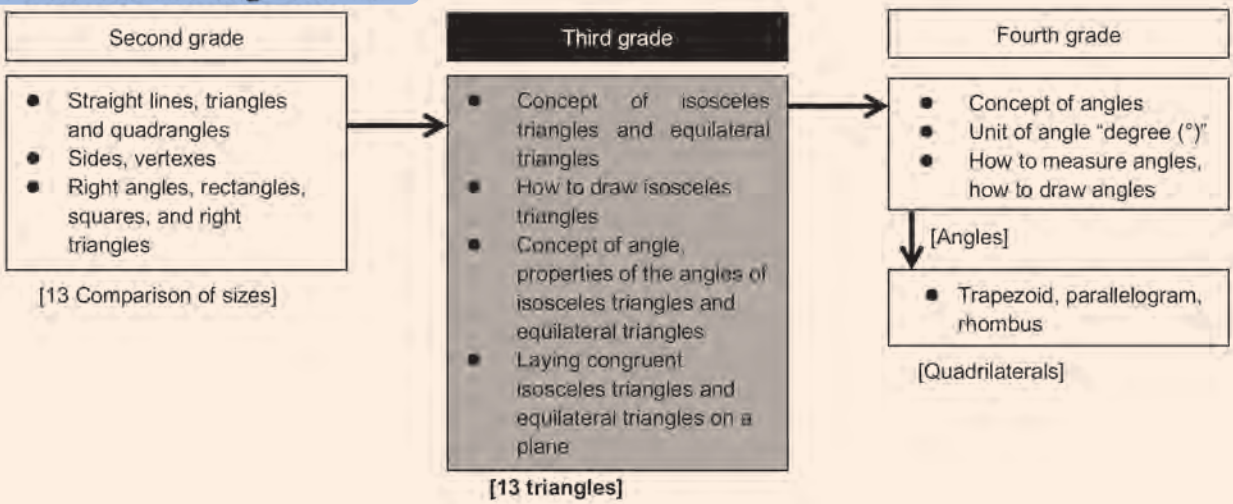
Isosceles and Equilateral Triangles : Let students discuss on the properties of each triangles made of different lengths of straws/sticks focusing on the lengths of sides. Avoid teaching definitions first.

How to Draw Triangles : The key for teaching this topic is to connect the previous topic to the way they use compasses and rulers. It means students should find that the compasses help us to draw triangles with given lengths. Then they should connect the ways of drawing triangles to the definitions of isosceles triangles.

Triangles and Angles : Students develop their concept of angles from intuitive understanding such as "pointed thing" to "the figure formed by 2 straight lines". They also should discuss on the sizes of angles by direct comparison. They can copy angles on papers and directly compare by overwrapping, so that they will be able to deepen the understanding on sizes of angles.

Designing Patterns : Students will be more familiar with triangular shapes by designing and also get friendly to triangular shapes and patterns in their daily life in this topic.

3. Related Learning Contents



Unit 13

Unit: Triangles
Sub-unit: 1. Isosceles and Equilateral Triangles
Lesson 1 of 5 (Double Period)

Textbook Page : p.133
Actual Lesson 089

Sub-unit Objectives

- To understand the Isosceles and Equilateral triangles by sorting them according to their structure.

Lesson Objectives

- To make various triangles by combining same or different lengths of sticks.

Prior Knowledge

- Properties of triangle (Elementary)

Preparation

- Students bring following materials;

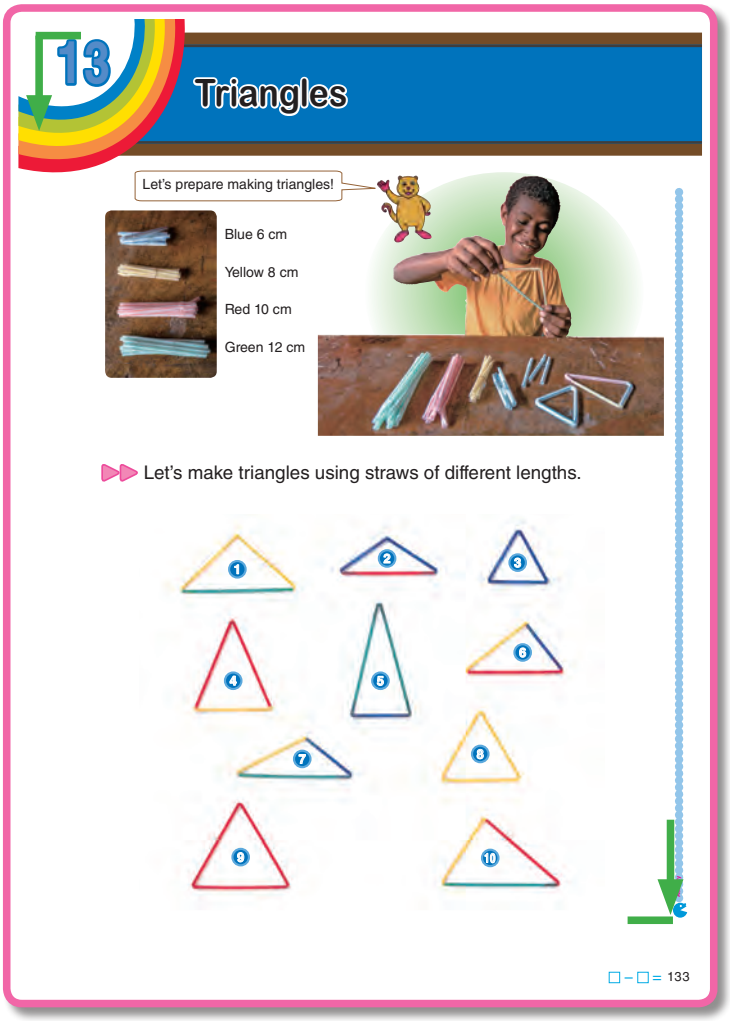
4×6 cm sticks or straws
4×8 cm sticks or straws
4×10 cm sticks or straws
4×12 cm sticks or straws
Blue Tack

Assessment

- Enjoy making various triangles using straws or sticks F
- Think about the criteria for categorising triangles. F S

• Teacher's Notes •

If straws are not available then sticks can be used instead.



Lesson Flow

1 Make triangles by choosing 3 sticks/straws out of 4 different length of sticks or straws.

T Introduce the main task.

T Let's make a triangle. "How many sticks/straws do we need?"

S Three

S Pick the same size sticks/straws or combine different size sticks/straws to make as many triangles as possible.

TN It is important that students make as many different triangles as possible.

2 Think about how to make different groups.

T Let's sort out the triangle into certain groups. "What kind of criteria do we need to categorise the triangles into different groups?"

S Give their ideas.

- "Three sides equal, two sides equal or all sides different"
- "Using sizes, how big the triangle is or the colours (if straw is used)"

TN Keep the triangles for the next lesson.

Sample Blackboard Plan

Date: Chapter Name: Triangles Topic: Isosceles and Equilateral Triangles Lesson Number: 1 of 5

Main Task: Let's make triangles using sticks.

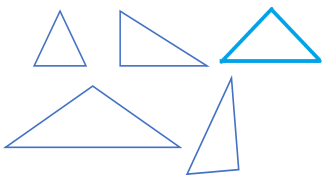
MT

Let's make Triangles by choosing 3 sticks out of 4.
□ How many sticks do we need to make a triangle? 3
□ How many triangles can you make from your sticks?
Let students to make as many triangles as they can.

Summary:

- Triangles can be made from 3 same lengths sticks or 3 different length sticks.
- They can be grouped according to their side length of sides or their sizes.

Students Ideas
Show their triangles in groups



Unit 13

Unit: Triangles
Sub-unit: 1. Isosceles and Equilateral Triangles
Lesson 2 of 5 (Double Period)

Textbook Page : p.134
Actual Lesson 090

Lesson Objectives

- To think about how to make groups focusing on their lengths or sides of triangle.

Prior Knowledge

- Making various triangles. (Previous lesson)

Preparation

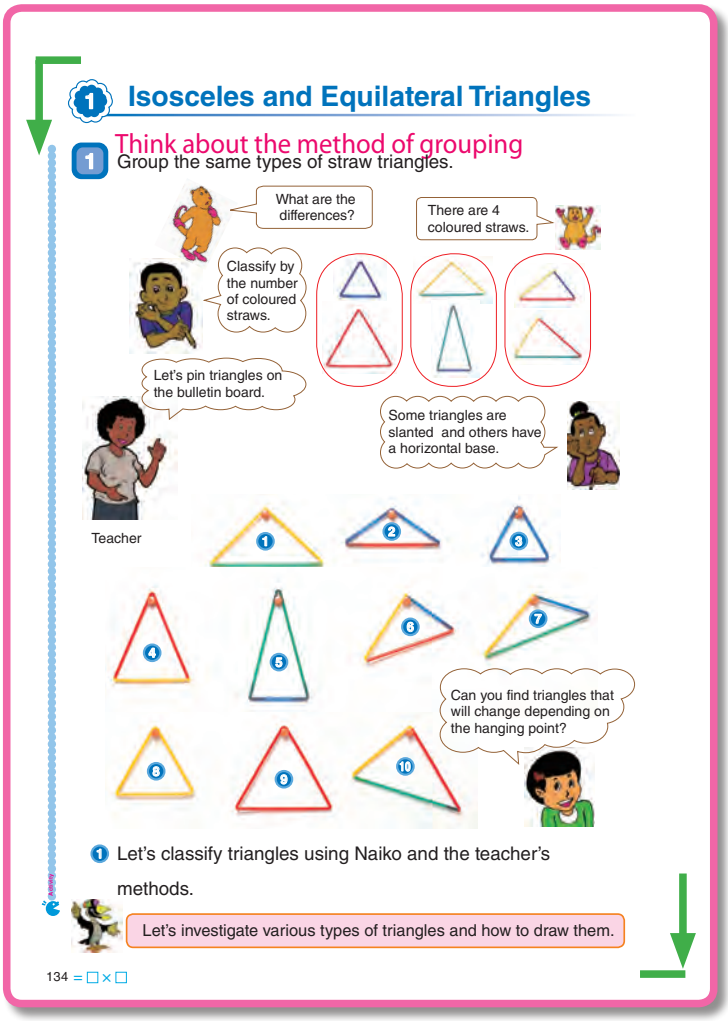
- Triangles made in previous lesson

Assessment

- Think about how to make groups focusing on their lengths or sides. F
- Categorise triangles correctly according to certain criteria. S

• Teacher's Notes •

In this lesson the students will group their triangles according to their side lengths; all sides equal, two sides equal and all sides different.



Lesson Flow

1 ❶ Think about how to make groups of triangles.

T There are 10 triangles. “How can we group them?”
S By shape or by size, (by colour using the textbook).
T Introduce the main task.

2 ❶ Make a group focusing on the side of triangle. There are 3 types of triangles.

T Let’s classify by their sides.
S Organise them as follows:
- All sides are equal
- Two sides are equal
- All three sides are different

T Select students to tack some samples on the black board.
S Tack their triangles under each sub-titles and give reasons.
S Summarise lesson.

Sample Blackboard Plan

Date: Topic: Isosceles and Equilateral Triangle Lesson Number: 2 of 5

Main Task: To think about how to group triangles

1

Let’s think about how to make different groups of Triangles.

What kind of criteria do we need to use to categorize the triangles into different groups?

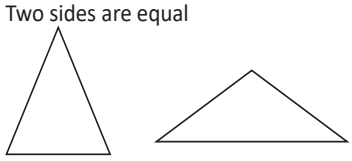
Students Ideas
Show their triangles in groups

MT

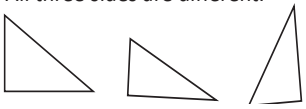
❶ How can we group them?
By shape, by size, as slanted or with horizontal base

Let’s make Groups of Triangles focusing on the sides.
- Let’s classify by their side lengths.
- Let’s organize them by hanging them

Two sides are equal



All three sides are different.



Summary:
When placing the triangles on the desk, some Triangles were slanted others have a horizontal base.
We can classify them by their sizes or by side lengths.

Unit 13

Unit: Triangles
Sub-unit: 1. Isosceles and Equilateral Triangles
Lesson 3 of 5 (Double Period)

Textbook Page : p.135
Actual Lesson 091

Lesson Objectives

- To sort out the triangles according to side length.
- To identify the properties of triangles according to the side length.

Prior Knowledge

- Categorisation of triangles by sides

Preparation

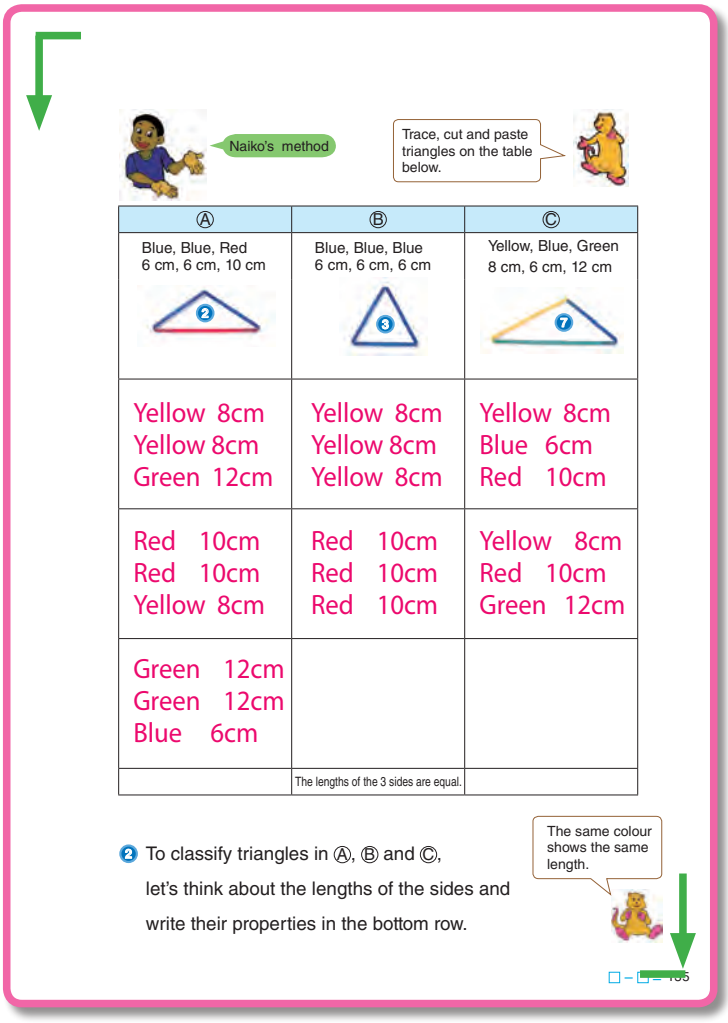
- Table with 3 categories

Assessment

- Sort out triangles according to the three criteria. F
- Understand the characteristics of each triangle. F S

• Teacher's Notes •

From the previous lesson the students had made triangles and categorised them into the three categories. In this lesson they will use the textbook.
The students will trace the triangles on page 133. Identify their lengths and group them on a table. Give emphasis on the length of sides and allow students to learn the properties of the three triangles.



Naiko's method

Trace, cut and paste triangles on the table below.

Ⓐ	Ⓑ	Ⓒ
Blue, Blue, Red 6 cm, 6 cm, 10 cm	Blue, Blue, Blue 6 cm, 6 cm, 6 cm	Yellow, Blue, Green 8 cm, 6 cm, 12 cm
Yellow 8cm Yellow 8cm Green 12cm	Yellow 8cm Yellow 8cm Yellow 8cm	Yellow 8cm Blue 6cm Red 10cm
Red 10cm Red 10cm Yellow 8cm	Red 10cm Red 10cm Red 10cm	Yellow 8cm Red 10cm Green 12cm
Green 12cm Green 12cm Blue 6cm		
	The lengths of the 3 sides are equal.	

② To classify triangles in Ⓐ, Ⓑ and Ⓒ, let's think about the lengths of the sides and write their properties in the bottom row.

The same colour shows the same length.

Lesson Flow

1 Review the previous lesson.

T How do we separate the triangles?
S Depending on the sides, all same lengths, two sides are the same, and all sides are different.
T Introduce the main task.

2 Organise the 10 triangles into the table according to their side lengths.

T Draw the table on the board and interact with students to organise the triangles.
S Trace and cut the triangles from the previous page.
S Sort out all types of triangles into three categories.
TN Give enough time for the students to think and categorise all triangles.

3 2 Confirm the properties of the three types.

T What kind of properties does each triangle have?
S All the sides are same, two sides are the same, and all sides are different.
S Summarise the properties in their exercise book.

Sample Blackboard Plan

Date:

Topic: Isosceles and Equilateral Triangle

Lesson Number: 3 of 5

Main Task: Let's group using Lengths of sides.

Review

How do we separate the triangles?
According to their sides, all lengths same, two sides are the same, and all sides are different.

MT

1 Let's separate the 10 triangles into table according to their lengths

Students Ideas
Show their table

1

Ⓐ	Ⓑ	Ⓒ
Blue 6 cm, Blue 6 cm, Red 10 cm 	Blue 6 cm, Blue 6 cm, Blue 6 cm 	Yellow 8 cm, Blue 6 cm, Green 12cm 
Yellow 8 cm, Yellow 8 cm, Green 12cm 	Yellow 8 cm, Yellow 8 cm, Yellow 8 cm 	Yellow 8 cm, Blue 6 cm, Red 10 cm 
Red 10 cm, Red 10 cm, Yellow 8 cm 	Red 10 cm, Red 10 cm, Red 10 cm 	Yellow 8 cm, Red 10 cm, Green 12cm 
Green 12cm, Green 12cm, Blue 6 cm 		
Lengths of two sides are equal	Lengths of three side are equal	All sides are not equal

2 Think about the lengths of the sides and write their properties in the bottom row.

Summary:

The characteristic of triangles are defined by their sides. All sides same, two sides same and all sides different.

Unit 13

Unit: Triangles
Sub-unit: 1. Isosceles and Equilateral Triangles
Lesson 4 of 5 (Double Period)

Textbook Page : p.136
Actual Lesson 092

Lesson Objectives

- To define the triangle which has two sides equal and it is called isosceles triangle.

Prior Knowledge

- Properties of triangles

Preparation

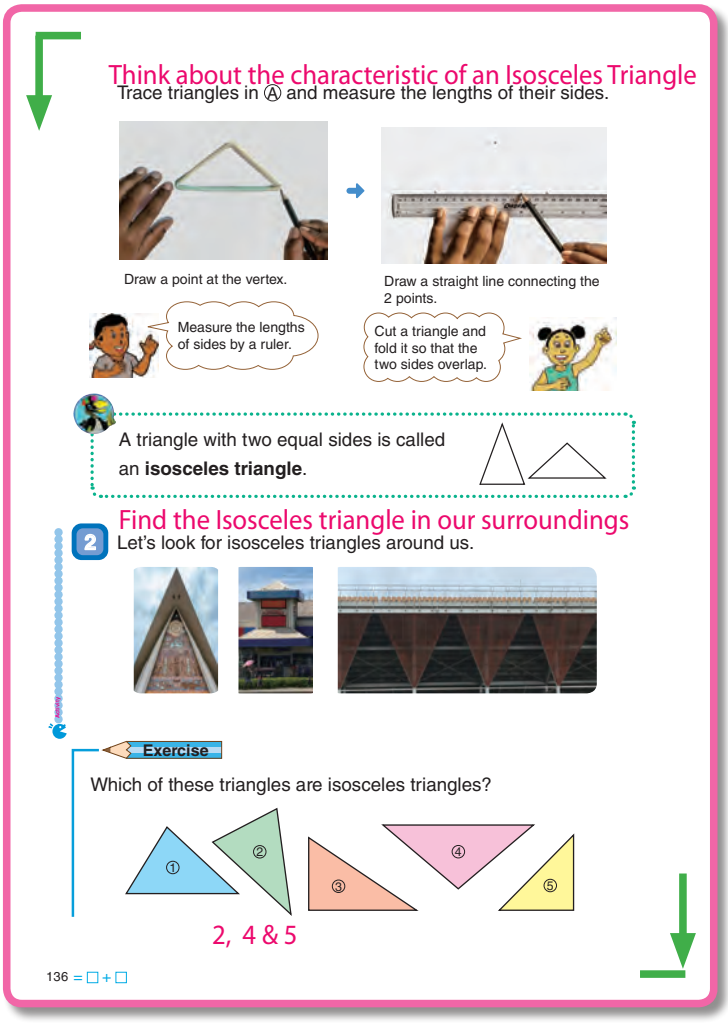
- Ruler, Tracing paper, Triangle A

Assessment

- Investigate and define the triangle with two sides being equal. F
- Do the exercises correctly. S

• Teacher's Notes •

Today's lesson focuses on Isosceles triangle when two sides are equal. Help students to avoid the mistake of focusing on the position of the triangle and direct their attention on the lengths of sides. The triangle may not be upright but its length is important. When two side lengths of a triangle are equal despite their position, we called it an isosceles triangle.



Lesson Flow

1 Know the proper name of triangle A from the table.

S Trace triangle A and measure the sides.
S Share the characteristics that two sides are equal.
T Concludes: "A triangle with two equal sides is called Isosceles Triangle."
T Introduce the main task.

2 2 Find the Isosceles triangle in our surroundings.

T Ask students to think of their surroundings.
S Imagine in their daily lives and share their ideas.
TN Not all triangles will sit on their base.

3 Do the Exercises.

TN Position does not matter for deciding.

Sample Blackboard Plan

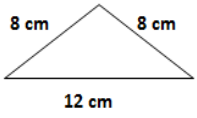
Date: Topic: Isosceles and Equilateral Triangle Lesson Number: 4 of 5

Main Task: Let's name the triangle which has two sides that are equal.

1 ❸ Trace triangle A and measure their lengths of sides.

Students Ideas
Illustrating how they draw triangle A

Important Point



MT

2 Let's find Isosceles triangles in our surroundings.
Eg: Front of the roof tops

Students Ideas
Write names of objects that are Isosceles.

Summary:
A Triangle with two sides that are equal is called Isosceles Triangle.

Exercise
Which of these triangles are isosceles triangles?
2, 4 and 5

(It may be upside down or slanted, when two sides are equal we called it an isosceles triangle.)

Unit 13

Unit: Triangles
Sub-unit: 1. Isosceles and Equilateral Triangles
Lesson 5 of 5 (Double Period)

Textbook Page :
p.137
Actual Lesson 093

Lesson Objectives

- To define the triangle which has all sides equal and it is called equilateral triangle.

Prior Knowledge

- Isosceles triangle (Previous lesson)

Preparation

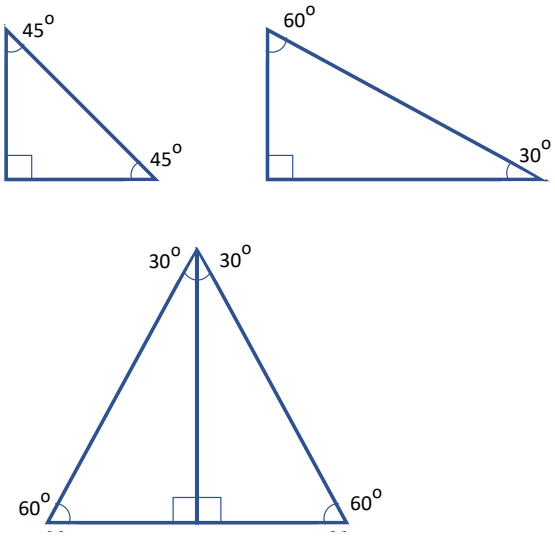
- Ruler, Tracing paper, Triangle B, Set square

Assessment

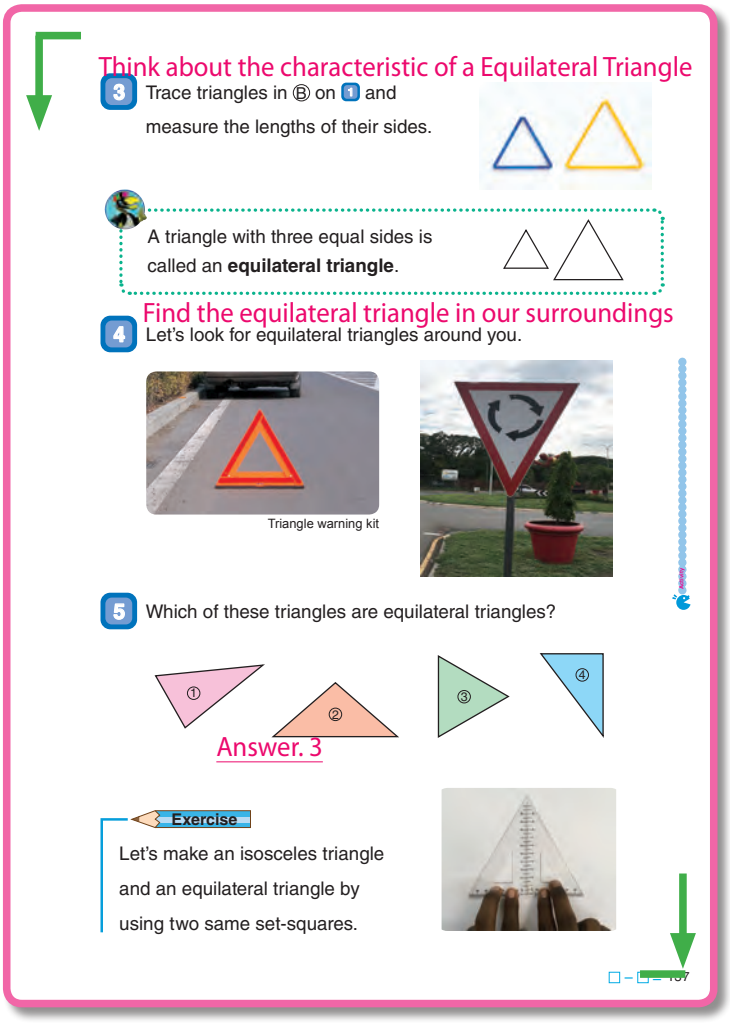
- Investigate and define the triangle which has all sides equal. F
- Do the exercises correctly. S

• Teacher's Notes •

There are two different set squares. One set square has 30°, 60° and 90° and the other has 45°, 45° and 90° set square. The exercise in this lesson requires the students to use one pair to draw their equilateral triangle and isosceles triangle. Only Isosceles can be form from the two set squares. Equilateral triangle can be formed from one of the two.



Equilateral triangle



Lesson Flow

1 3 Know the proper name of triangle B from the table.

S Trace triangle B and measure the sides.
S Share the characteristics that all sides are equal.
T Conclude that "A triangle with three equal sides is called Equilateral Triangle."
T Introduce the main task.

2 Find the Equilateral triangle in our surroundings.

S 4 Imagine in our daily lives and share their ideas.
T Confirm with students using the characteristic of an equilateral triangle.
S 5 Identify triangle ③ as an equilateral triangle.

3 Do the Exercises.

TN Refer to the Teacher's Notes

Sample Blackboard Plan

Date: Topic: Isosceles and Equilateral Triangle Lesson Number: 5 of 5

Main Task: Let's name the triangle which has all 3 sides that are equal.

Review

Name the Triangle with two sides that are equal.

A Triangle with two sides that are equal is called Isosceles Triangle.

2 Let's look for isosceles triangles around us.

3 Trace triangle B and measure the length of sides.

Students Ideas
Display their work

A triangle with two equal sides is called an **isosceles triangle**.

MT

4 Let's find Equilateral triangles in our surroundings.
Eg: the Give Way sign on the road

Students Ideas
Write names of objects that are Equilaterals.

5 Which of these triangles are isosceles triangles?

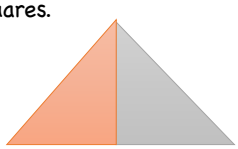
Students Ideas
Write their Answers.

Answer: 2, 4 and 5

Summary:
A Triangle with all 3 sides that are equal is called Equilateral Triangle.

Exercise

Lets make isosceles and equilateral triangle by using two same set – squares.



Unit 13

Unit: Triangles
Sub-unit: 2. How to Draw Triangles
Lesson 1 of 2 (Double Period)

Textbook Page : p.138
Actual Lesson 094

Sub-unit Objectives

- To understand how to draw Isosceles and Equilateral triangle.

Lesson Objectives

- To draw Isosceles triangle using compass and ruler.

Prior Knowledge

- Properties of triangles

Preparation

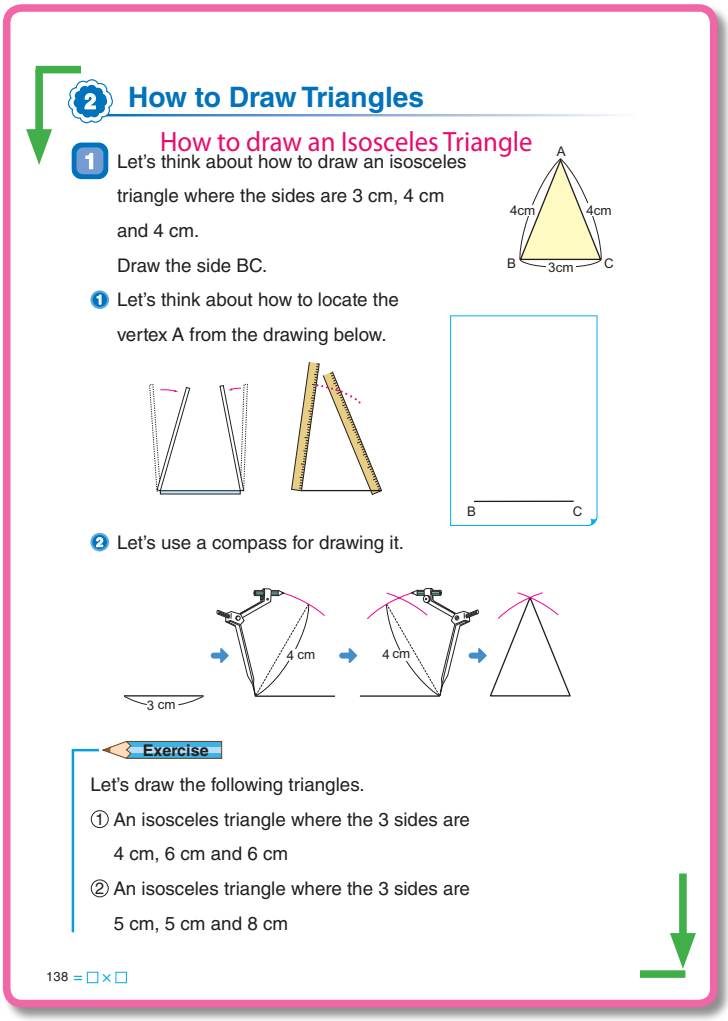
- Compass and Rulers
- Blackboard compass
- Blackboard rules

Assessment

- Draw isosceles triangle by confirming the characteristics of triangles. F
- Do the exercises correctly. S

• Teacher's Notes •

How to use a compass to draw an Isosceles triangle;
1. Extend the compass to the needed length.
2. Hold the compass from the head and do not move the legs. Make an arc from both ends of the given length.
3. The intersection of the marking will be the third vertex of the triangle.
4. Connect the lines to form an isosceles triangle. The distance should be the same from the given length to the mark formed by the arc.



2 How to Draw Triangles

How to draw an Isosceles Triangle

1 Let's think about how to draw an isosceles triangle where the sides are 3 cm, 4 cm and 4 cm.

Draw the side BC.

A
4cm
4cm
B
3cm
C

1 Let's think about how to locate the vertex A from the drawing below.

B C

2 Let's use a compass for drawing it.

4 cm
4 cm
3 cm

Exercise

Let's draw the following triangles.

① An isosceles triangle where the 3 sides are 4 cm, 6 cm and 6 cm

② An isosceles triangle where the 3 sides are 5 cm, 5 cm and 8 cm

138 = □ × □

Lesson Flow

1 ① ① Draw an Isosceles triangle with the sides of 3 cm, 4 cm, and 4 cm.

T Introduce the main task.
S Draw 3 cm using ruler.
T Where can we find point A?
S At the centre of 3 cm" or "in the middle"
T ② Demonstrates the use of compass by opening the compass to 4 cm, then draw arcs from both sides to form point A.
S Draw the isosceles triangle by observing their teacher's demonstration.
TN Refer to the Teacher's Notes

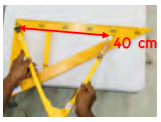
2 Do the Exercises.

TN (1) Base is 4 cm. 6 cm is drawn by compass.
(2) Base is 8 cm. 5 cm is drawn by compass.

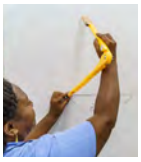
• Teacher's Notes 2 •

How to Draw an Isosceles Triangle with a Compass

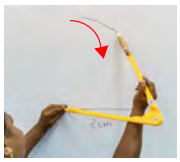
Measure 30 cm on the board and draw a line for the base of triangle.
(3 cm for students)



Measure the length between the tips of the Blackboard compass to 40cm for the sides.
(4 cm for students)

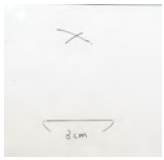


Hold the compass on the arms without moving the them to avoid changing the length.

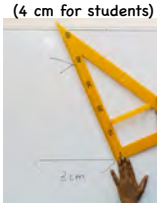


Point the tip of one arm of the compass stable onto one end of the base line and draw an arc with the other arm attached to the chalk or marker.

Do the same with the other end of the base line so that the 2 arcs intersect.

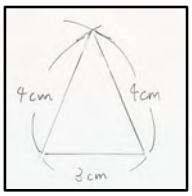


The intersection of the marked arcs is the third vertex of the triangle.



Use a ruler to draw a line from one end of the base line to the intersecting point.

Do the same for the other end of the base line to the intersecting point.



This is how the students' triangles should look like on the blackboard.

Note:
The Blackboard Triangle should have the actual side lengths of 30 cm, 40cm and 40 cm as Isosceles Triangle .

Sample Blackboard Plan

Date:

Chapter Name: Triangles

Topic: How to draw Triangles

Lesson Number: 1 of 2

MT

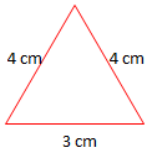
Main Task: Let's think about draw Isosceles triangle.

1

Let's draw an Isosceles triangle of 3cm, 4cm and 4cm.

Students Ideas
Illustrate their answers

① Draw a 3cm line and find point A using a ruler.



② Use the compass to find point A .

How to use compass to draw Isosceles triangle;

1. Extend the compass to the needed length.
2. Hold the compass from the head and do not move the legs. Make an arc from both ends.
3. The intersection of the marking will be the third vertex of the triangle.
4. Connect the lines to form an isosceles triangle. The distance should be the same from given length to the mark formed by the arc.

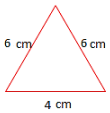
Summary:

Isosceles Triangles can be drawn by using a ruler and connect points made from the center.

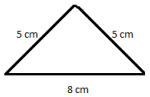
It can also be drawn using a compass, by stretching it to the required length and connect the lines to the point where the arc meet.

Exercise Lets draw the following triangles

① An isosceles triangle where the 3 sides are 4 cm, 6 cm and 6 cm.



② An isosceles triangle where the 3 sides are 5 cm, 5 cm and 8 cm



Unit 13

Unit: Triangles
Sub-unit: 2. How to Draw Triangles
Lesson 2 of 2 (Double Period)

Textbook Page : p.139
Actual Lesson 095

Lesson Objectives

- To draw an equilateral triangle using a compass and a ruler.

Prior Knowledge

- How to draw an isocseles triangle using a compass and a ruler.

Preparation

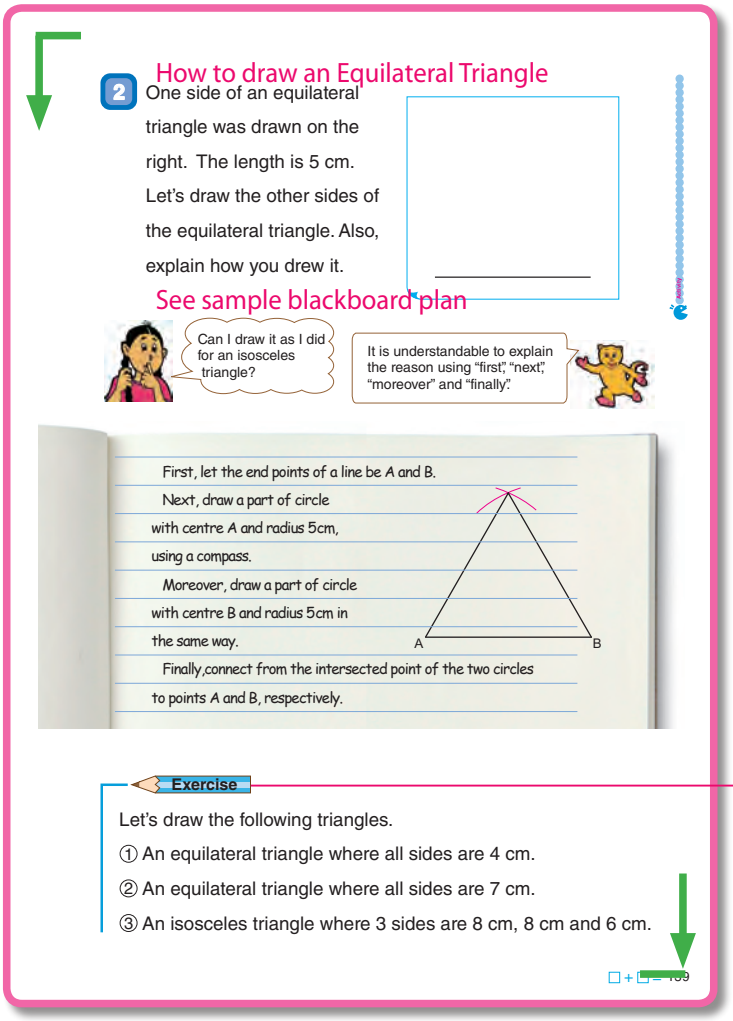
- Compass and Rulers

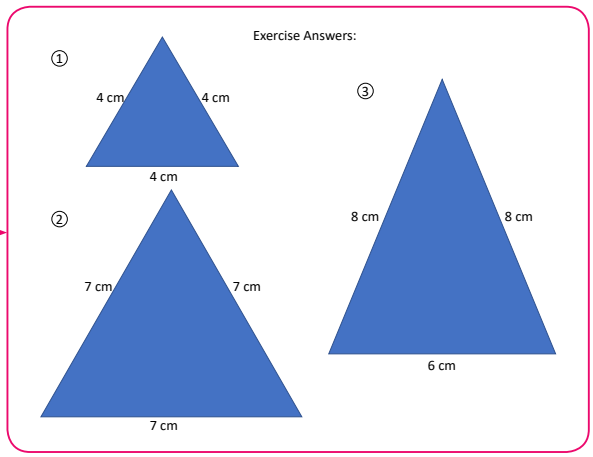
Assessment

- Draw an equilateral triangle by confirming the characteristics of triangles. F
- Do the exercises correctly. S

• Teacher's Notes •

The draw an equilateral triangle, we apply the same method of drawing isosceles triangle. The only difference is that the length of the bass and the sides should be the same.





Lesson Flow

1 2 Draw an Equilateral triangle of 5 cm.

T Introduce the main task.
S Draw 5 cm using a ruler.
T Where can we find the meeting point?
S From the centre of 5 cm or in the middle.
Draw using compass.
S Realise that same method as isosceles triangle can be applied to the equilateral triangle.
S Write the explanation in their exercise book.
TN In case if it is difficult to write, let them explain in words.

2 Summarise how to draw equilateral triangle in their exercise book.

3 Complete the exercise

Sample Blackboard Plan

Date: Chapter Name: Triangles Topic: How to draw Triangles Lesson Number: 2 of 2

Main Task: Let's think about how to draw Equilateral triangle.

Review

MT

What are the important points in drawing an Isosceles Triangles?

- Isosceles Triangles can be drawn by using a ruler.
- It can also be drawn using a compass, by stretching it to the required length and connect the lines to the point where the arc meet.

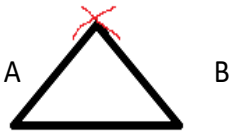
2 Let's draw an Equilateral triangle of 5cm.

Students Ideas
Illustrate their answers

- Find the center point using a ruler and compass.

Steps to draw

1. Let the end points of a line be A and B.
2. Draw a part of circle with center A and radius 5 cm, using a compass.
3. Draw a part of a circle with center B and radius 5 cm in the same way.
4. Connect from the intersected point of the two circles to points A and , respectively.



Important Point

The radii of the circle have the same length all around.
First we measure the radii.
Then we connect the points of B and C with the same length.

Summary:

Isosceles Triangles can be drawn by using a ruler and connect points made from the center.
It can also be drawn using a compass, by drawing two circles with same radius. Then connect the lines from each radii to where the circles meet.

Unit 13

Unit: Triangles
Sub-unit: 3. Triangles and Angles
Lesson 1 of 2 (Double Period)

Textbook Page : p.140
Actual Lesson 096

Sub-unit Objectives

- To understand about the angles, the name, its meaning and parts.
- To think about the structure of an Equilateral and Isosceles triangle

Lesson Objectives

- To understand the meaning of vertex, its sides and size of angle.
- To define the meaning of angles.

Prior Knowledge

- Properties of triangles

Preparation

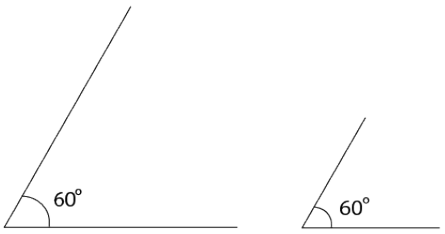
- Triangular Rulers (Set squares)

Assessment

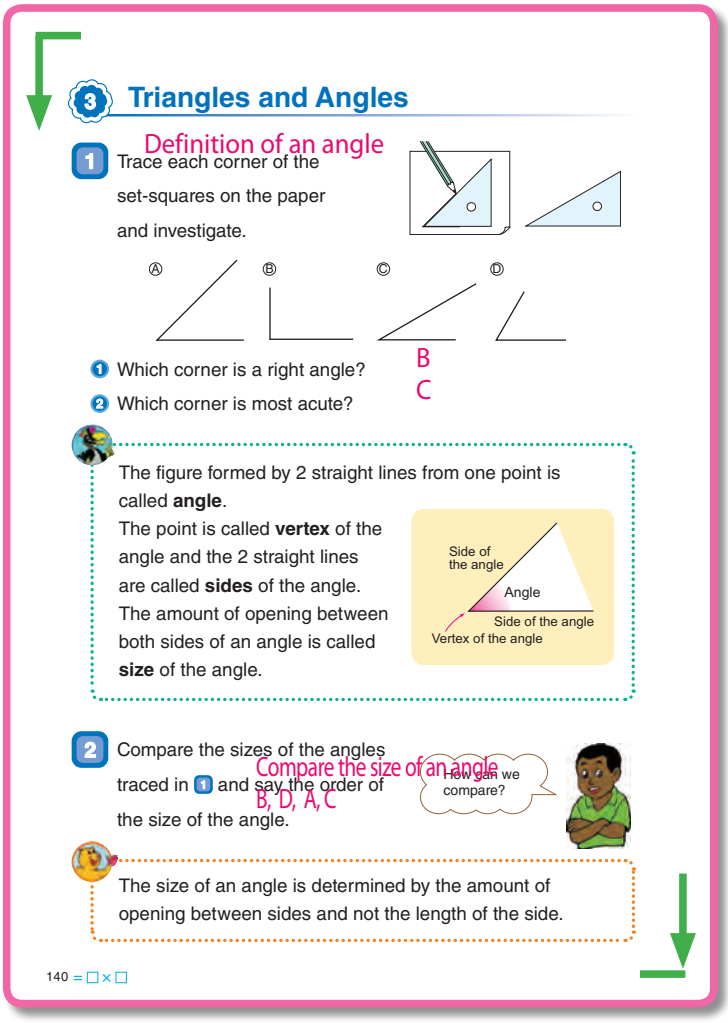
- Analyse an angle of triangle. F
- Understand the meaning of vertex, its size and sides. S

• Teacher's Notes •

Misconception of angle side and size, Teacher should emphasise to the students that the angle of a triangle is not determine by the length of the sides but the angle size.
For example:



These two angles do not have same side lengths but have same magnitude.



3 Triangles and Angles

Definition of an angle

1 Trace each corner of the set-squares on the paper and investigate.

Ⓐ Ⓑ Ⓒ Ⓓ

1 Which corner is a right angle? B
2 Which corner is most acute? C

The figure formed by 2 straight lines from one point is called **angle**.
The point is called **vertex** of the angle and the 2 straight lines are called **sides** of the angle.
The amount of opening between both sides of an angle is called **size** of the angle.

Side of the angle
Angle
Side of the angle
Vertex of the angle

2 Compare the sizes of the angles traced in 1 and say the order of the size of the angle.

Compare the size of an angle
B, D, A, C
How can we compare?

The size of an angle is determined by the amount of opening between sides and not the length of the side.

140 = □ × □

Lesson Flow

1 ① Trace the set squares and make six angles.

S Trace the set squares.
T ① Which corner is the right angle?
S B
T ② Which angle is most acute?
S C
T Introduce the main task.

2 Understand the definition of an angle and the elements to make an angle and its meaning.

T Draw an angle on the board and explain the important point using the diagram.

3 ② Compare the size of the angle A, B, C and D.

T Which angle comes first in the order?"
S B, D, A and C

4 Understand the important point about angles.

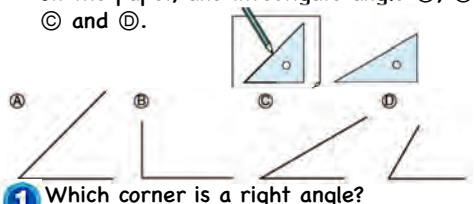
T Explain the important point in the box.
TN Refer to the teacher's note.

Sample Blackboard Plan

Date: Topic: Triangles and Angles Lesson Number: 1 of 2

Main Task: Let's Learn more about Triangles

① Let's trace the corner of the set – square on the paper, and investigate angle Ⓐ, Ⓑ, Ⓒ and Ⓓ.



① Which corner is a right angle?

Students Ideas
Illustrate their ideas

Answer: Ⓑ

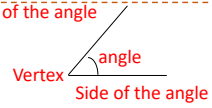
② Which corner is most acute?

Students Ideas
Illustrate their ideas

MT

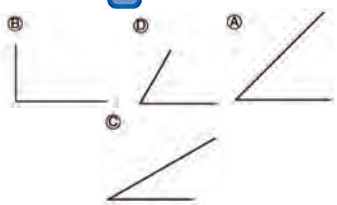
Now let's define angle

Important Point



The shape that is made by 2 straight lines from one point is called angle.
The point is called vertex of the angle, and 2 straight lines are called sides of the angle.
The amount of opening between both sides of an angle is called size of the angle.

② Let's compare the size of Ⓐ, Ⓑ, Ⓒ and Ⓓ in ① and say the order.



Summary:

Important Point

The size of an angle is determine by the amount of opening between sides and not the length of the side.

Unit 13

Unit: Triangles
Sub-unit: 3. Triangles and Angles
Lesson 2 of 2 (Single Period)

Textbook Page : p.141
Actual Lesson 097

Lesson Objectives

- To investigate the characteristic of angles in an Isoseceles and Equilateral triangles.

Prior Knowledge

- Definition of sides, vertex and angles of the triangle (Previous lesson)

Preparation

- Blank Paper, Scissors, Ruler, Set squares

Assessment

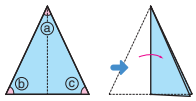
- Investigate the characteristic of angles in an Isoseceles and Equilateral triangle. F
- Do the exercise correctly. S

• Teacher's Notes •

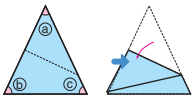
This is the summary lesson of Isosceles and Equilateral triangles. The students activity is on direct comparison where they confirm that the two angels of isosceles triangle are equal and all angles of equilateral triangles are equal.

3 Size of the angle of Isosceles

Let's draw an isosceles triangle on a sheet of paper and cut it.



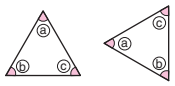
1. Compare the sizes of angle ⓑ and ⓒ. b and c are equal
2. Compare the sizes of angle ⓐ and ⓑ. a and b different



In an **isosceles triangle**, sizes of two angles are equal.

4 Size of the angles of Equilateral Triangle

Let's draw an equilateral triangle on the paper and cut it, then compare the sizes of angles ⓑ and ⓒ, and ⓐ and ⓑ, respectively.

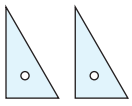


Angle b and c are equal
Angle a and c are equal

In an **equilateral triangle**, sizes of three angles are equal.

Exercise

Can we make the following figures using the set-squares as shown on the right?



rectangle, square, right triangle equilateral triangle, isosceles triangle

Yes no no
No yes

Lesson Flow

1 (3) Draw an Isosceles triangle on a paper and cut then investigate the angles.

T Introduce the main task.
T Distribute paper and scissors to the students.
S Draw and cut an Isosceles triangle. Then fold in half.
T (1) How is angle b compared to c?
S They are the same when folded in half.
T (2) How about a and b?
S They are different because when folded they are different in size.
T In an isosceles triangle the size of the two angles are equal.
T Summarise the important point in the box .

2 (4) Investigate the angles of an equilateral triangle.

S Fold the paper in the same way as previous activity and find out that all angles are equal.
T In an equilateral triangle the size of all three angles are equal."
T Summarise the important point in the box .

3 Do the exercise.

Sample Blackboard Plan

Date: Topic: Triangles and Angles Lesson Number: 2 of 2

Main Task: Let's compare angle in Isosceles and Equilateral triangles.

Review

MT

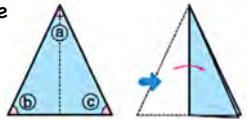
What do you know about Isosceles and Equilateral triangles?

Students Ideas
Explain their Answers

Isosceles Triangles have two sides of the three sides that are equal.
Equilateral have all three sides that are equal.

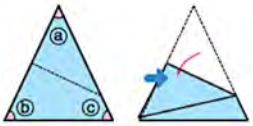
3 Let's draw an Isosceles triangle on a paper and cut and investigate angles.

1 Fold in Half then compare size of angle ⓑ and ⓒ



Answer: The angles are equal.

2 Fold corners of ⓐ and ⓑ and compare angle of ⓑ and ⓐ.



Answer: The angles are different.

In an **isosceles triangle**, sizes of two angles are equal.

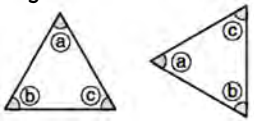
4 Now lets make Equilateral angles.

- Fold ⓑ and ⓒ

The angles are equal.

- Fold ⓐ and ⓑ

The angles are equal.



In an **equilateral triangle**, sizes of three angles are equal.

Exercise

Can you make the following figures using the set – squares?

- Rectangle (yes)
- Square (no)
- Right triangle (No)
- Equilateral triangle (No)
- Isosceles triangle (Yes)

Summary:

When folding isosceles triangles, two angles are equal.
When folding Equilateral triangles, three angles are equal.

Unit 13

Unit: Triangles
Sub-unit: 4. Designing Patterns
Lesson 1 of 1 (Double Period)

Textbook Page : p.142
Actual Lesson 098

Sub-unit Objectives

- To enjoy making or designing various patterns using Isosceles or Equilateral triangle.

Lesson Objectives

- To enjoy making or designing various patterns using Isosceles or Equilateral triangles.

Prior Knowledge

- Properties of isosceles and equilateral triangles

Preparation

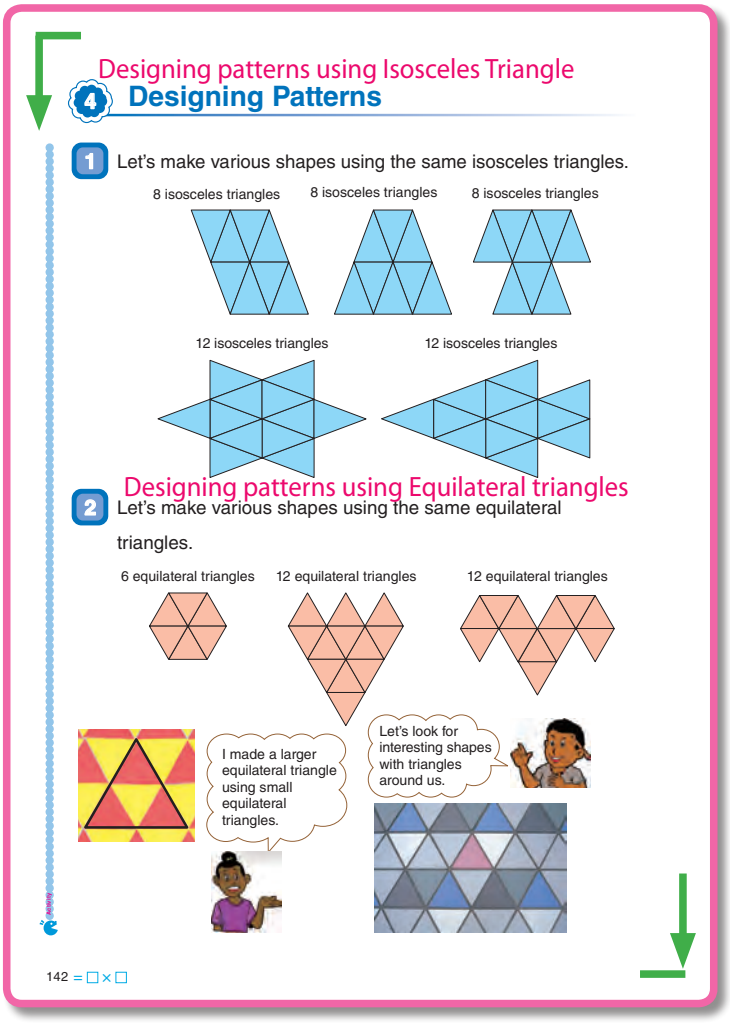
- Drawing papers, Ruler, Scissors

Assessment

- Enjoy making various patterns using isosceles or equilateral triangle. F S

• Teacher's Notes •

In this lesson, ensure that all the pieces of triangles are exactly the same in shapes and sizes.



Lesson Flow

1 (1) **Make many isosceles triangles and cut.**

T Distribute papers to the students and cut the paper to make many isosceles triangles

T Introduce the main task.

2 **Make various patterns using isosceles triangles.**

S Make patterns as shown in the textbook.

S Make their own patterns using isosceles triangle and share with their friends.

3 (2) **Make many equilateral triangles and cut.**

T Distribute papers to the students and cut the paper to make many equilateral triangles.

4 **Make various patterns using equilateral triangles.**

S Make patterns as shown in the textbook.

S Make their own patterns using equilateral triangles and share with their friends.

5 **Let's find the patterns by using triangles in our surroundings.**

S Look for interesting patterns with triangles within their surroundings and list them.

Sample Blackboard Plan

Date: Topic: Triangles and Angles Lesson Number: 1 of 1

Main Task: Let's use Isosceles and Equilateral triangles to make patterns.

Review

MT

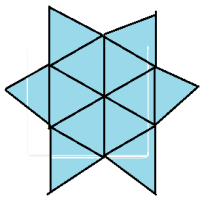
What did we learn about isosceles and equilateral triangles?

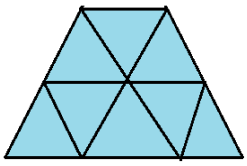
Students Ideas
Explain their Answers

Isosceles triangles have two equal lengths and two equal angles.

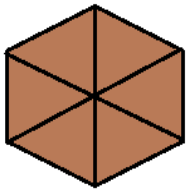
Equilateral angles have all sides that are equal in length and all angles equal.

1 Let's make many Isosceles Triangle and cut.





2 Let's make many Equilateral Triangle and cut.



Summary:

We can make beautiful patterns from Isosceles and Equilateral triangles.

Unit 13

Unit: Triangles
Sub-unit: Exercise and Evaluation
Lesson 1 of 1 (Double Period)

Textbook Page : p.143~p.144
Actual Lesson 099

Lesson Objectives

- To identify Isosceles triangles and Equilateral triangles.
- To use radius of a circle and draw triangles.
- To draw Isosceles and Equilateral Triangle from three given sides.

Prior Knowledge

- All the contents in this unit

Preparation

- Evaluation sheet for the students

Assessment

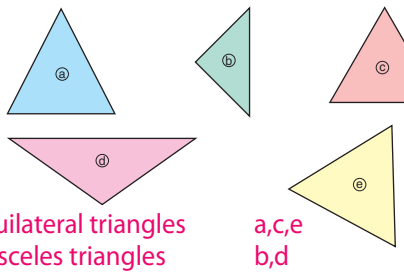
- Solve the exercises confirming what they have learned in this unit. F S

• Teacher's Notes •

Use 30 minutes for the exercise and give the evaluation test after that.

Exercise

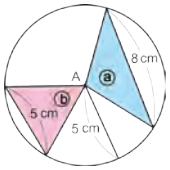
1 What kinds of triangles are these? Page 136



Equilateral triangles a,c,e
Isosceles triangles b,d

2 The radius of the circle on the right is 5 cm and its centre is point A. Page 139

① What kind of triangle is triangle ⓐ? Isosceles triangle
② What kind of triangle is triangle ⓑ? Equilateral triangle



3 Let's draw the following triangles. Pages 138 ~ 139

① An isosceles triangle where 3 sides are 7 cm, 5 cm and 5 cm.
② An equilateral triangle where all sides are 6 cm.

Grade 3 Do you remember?

Multiply the following numbers by 10 and 100 and divide them by 10.

① 20 ② 400 ③ 780 ④ 910

20x10/10= 20 400x10/10 = 400 780x10/10 = 7 80 910x 10/10 = 9 10
20x100/10=200 400x100/10 = 4000 780x100/10 = 78 00 910x100/10 = 91 00

□+□= 143 144 =□+□

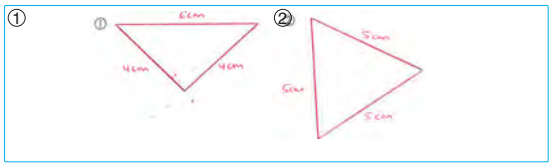
Problems

1 Let's fill in the ☐ with a number. Understanding special triangles.

① An isosceles triangle has two sides of the same length and two angles of the same size.
② An equilateral triangle has three sides of the same length and three angles of the same size.

2 Let's draw the following triangles. And what kinds of triangles are these? Drawing triangles from given three sides.

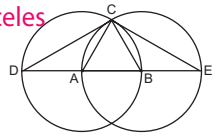
① A triangle with sides of the lengths 6 cm, 4 cm and 4 cm.
② A triangle with all sides of length 5 cm.



3 The radii of the 2 circles below are both 4 cm and their centres are A and B. BD and AE are diameter of each circle. Draw the same figure, and answer the following problems. Understanding properties of triangles and circle.

① Look for isosceles triangles. If you do not know the length of the sides, measure its length. (1) DAC and CBE are isosceles triangles

② A triangle CAB is an equilateral triangle. Explain its reason. (2) CAB is formed by the radius of the two circles. They are of the same length



Lesson Flow

1 ① **Differentiate isosceles triangle and equilateral triangle.**

TN There are various ways for differentiating triangles.

- Using a ruler to measure the sides of triangles.
- Using a compass to compare the length of each side.
- Using a protractor to measure the angles of a triangle.

2 ② **Differentiate isosceles triangle and equilateral triangle by using definitions of a circle.**

TN Let students notice that sides which are the radius of circle have the same length.

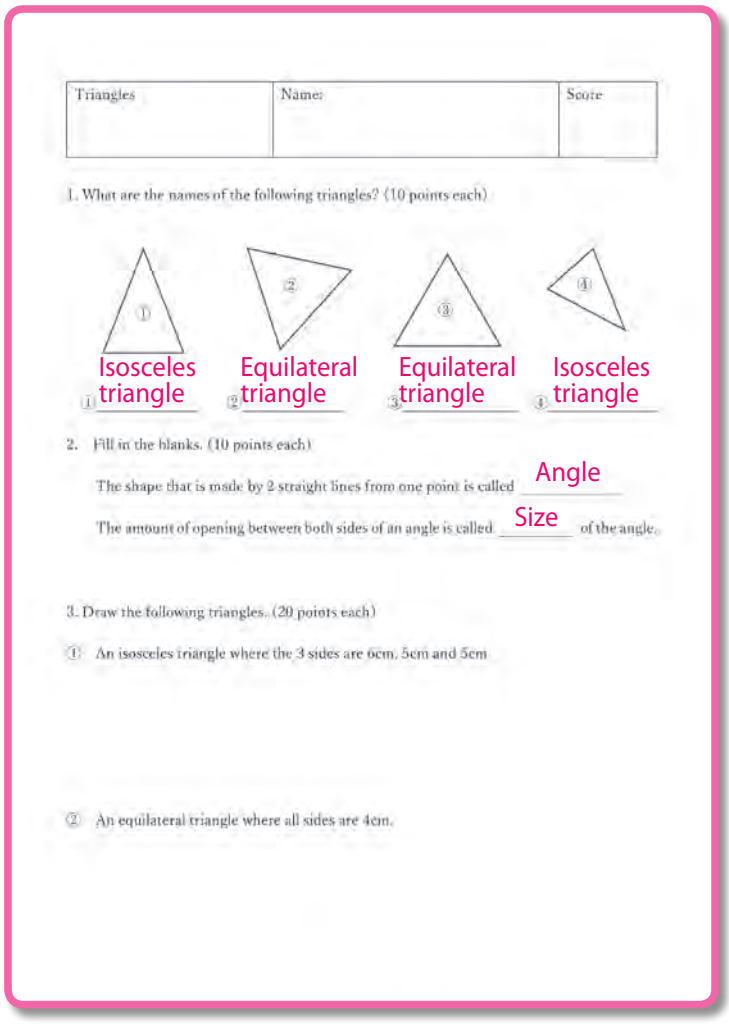
3 ③ **Draw isosceles triangle and equilateral triangle.**

4 ① **Confirm the definition of isosceles triangle and equilateral triangle.**

5 ② **Draw isosceles triangle and equilateral triangle.**

6 ③ **Confirm the definition of isosceles triangle and equilateral triangle by using definition of circle.**

TN Radius of both circles are 4 cm. Confirm which sides of the triangle are the radius of circle.



Triangles	Name:	Score

1. What are the names of the following triangles? (10 points each)

① Isosceles triangle ② Equilateral triangle ③ Equilateral triangle ④ Isosceles triangle

2. Fill in the blanks. (10 points each)

The shape that is made by 2 straight lines from one point is called Angle

The amount of opening between both sides of an angle is called Size of the angle.

3. Draw the following triangles. (20 points each)

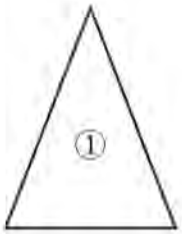
① An isosceles triangle where the 3 sides are 6cm, 5cm and 5cm

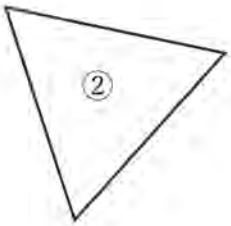
② An equilateral triangle where all sides are 4cm.

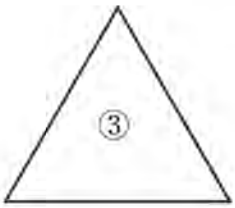
End of Chapter Test: Chapter 13 **Date:**

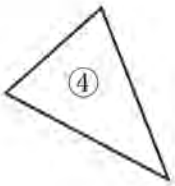
Triangles	Name:	Score

1. What are the names of the following triangles? (10 points each)









① _____ ② _____ ③ _____ ④ _____

2. Fill in the blanks. (10 points each)

The shape that is made by 2 straight lines from one point is called _____.

The amount of opening between both sides of an angle is called _____ of the angle.

3. Draw the following triangles. (20 points each)

① An isosceles triangle where the 3 sides are 6cm, 5cm and 5cm

② An equilateral triangle where all sides are 4cm.

Chapter 14 Tables and Graphs

1. Unit Objectives

- To arrange data and represent the data using table or graph. (3.4.3a,b and c)
- To understand how to read and write the bar graph. (3.4.3 c)

2. Teaching Overview

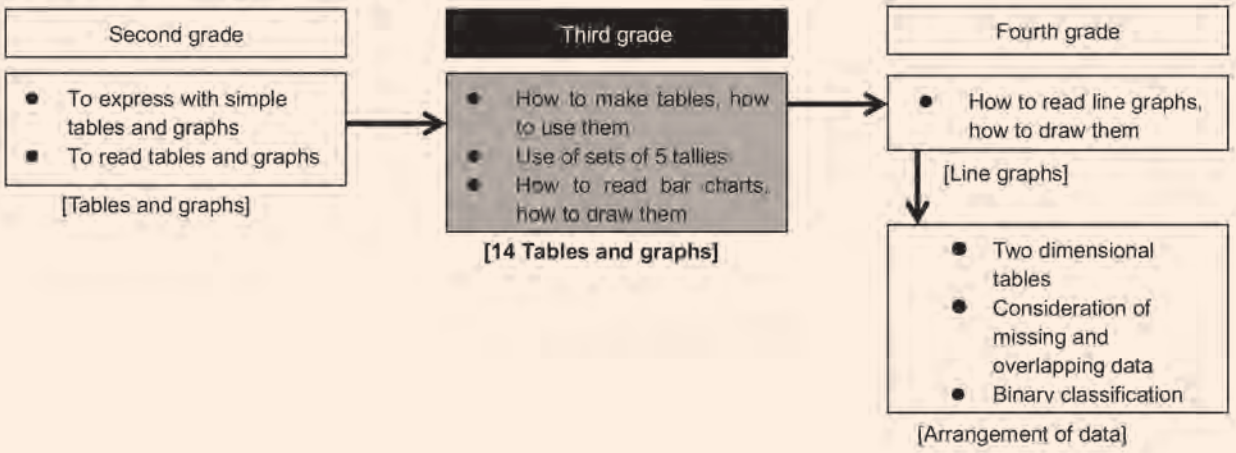
In this chapter, students marshal and coordinate information in daily life and represent in tables or graphs. They identify some perspectives for analysis based on purposes and interpret the tendency and characteristics of data for decision making or evaluation by applying the analysis. It is important for teachers to foster students' attitude to apply the skills of utilising the tables and graphs generated for decision making so that students will develop their interest and motivations.

Tables : Encourage students to find out how to marshal given information efficiently without any overlapping or omissions.

Bar Graphs : Students learn about bar graphs/charts here. Firstly they should find out what each axis represent for and unit of each measuring/scale. They also should understand the need of writing the title of a graph, marking or measuring scale and its unit to appreciate and utilise graphs. They should be able to interpret and describe characteristics of the original information or data.

Combined Tables : Here students combine tables into 1 by making 2 dimensions such as types of tools and months. It is advisable for students to feel appreciations on combined tables for them to analyse data.

3. Related Learning Contents



Unit 14

Unit: Tables and Graphs
Sub-unit: 1. Tables
Lesson 1 of 1 (Double Period)

Textbook Page : p.145~p.146
Actual Lesson 100

Sub-unit Objectives

- To collect data and understand how to represent the data by using a table.
- To read the table by thinking of the characteristics of the collected data.

Lesson Objectives

- To discuss and interpret how data is arranged and represented.
- To compare and discuss the method used to arrange the data.
- To arrange the data correctly.

Prior Knowledge

- Arrange the table from the data(Grade 2)
- Picture graph(Grade 2)

Preparation

- Charts of task 1

Assessment

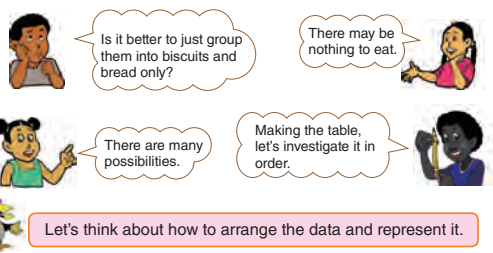
- Think about how to arrange data using a table effectively. F
- Arrange the data correctly in the table. F
- Understand how to arrange data using a table. S

• Teacher's Notes •

The purpose of this lesson is to realise the importance of arranging and sorting out data and the best way to represent it is when using tables.
There are many ways to represent data on tables such as the use of pictures, objects or symbols as learnt in earlier grades but students should now be encouraged to use tally marks as a convenient way to represent data when recording.

14 Tables and Graphs

The children in Morea's class investigated the kind of food eaten for breakfast last Sunday in Kerema town.



Let's think about how to arrange the data and represent it.

1 Tables

How to arrange the table by using tally mark.

1 The tables below are records of the kind of food children in Morea's class ate for breakfast last Sunday.

Morea's Table

Sunday's Breakfast

Kind	Number of children	
Biscuit	✓✓✓✓✓✓✓✓✓✓✓✓	12
Scone	✓✓✓✓✓✓✓✓✓✓✓✓✓✓	14
Bread	✓✓✓✓	4
Others	✓✓✓✓✓✓	6
Total		

Maia's Table

Sunday's Breakfast

Kind	Number of children	
Biscuit	𝍸 𝍸 ||	12
Scone	𝍸 𝍸 ||||	14
Bread	||||	4
Others	𝍸 |	6
Total		

1. Let's change the number of "✓" and the tally "𝍸" to numbers.

\|…1 \|\|…2 \|\|\|…3 \|\|\|\|…4 𝍸…5

2. Discuss the different ways how the 2 children made their tables. Maia's table is easy to understand because grouped by 5 tallys
3. What kind of food is eaten the most and by how many children? Scone 14 children
4. Write the total number of children surveyed. 36 children

Various Counting Methods

When we count the number of things, we use the signs 𝍸 and ✓.

□×□= 145 146 =□−□

Lesson Flow

1 ▶▶ Understand the objective of arranging data and discuss how to arrange them.

T Introduce the main task.
T Present brief instruction of the situation.
S Think about how to arrange the data of breakfast.
T How can we arrange the data?
S We can arrange the data using tally marks.
S We can arrange using a table.
T Let's think about how to arrange the data and represent it.

2 ❶❶ Think about and discuss how the data is arranged.

T Compare two tables and think about how the data is arranged.
S Morea used '✓' (Tick) to tally.
S Maia used 'I' (Stroke) to tally and grouped by 5.
T Count the number of each kind and fill the table.

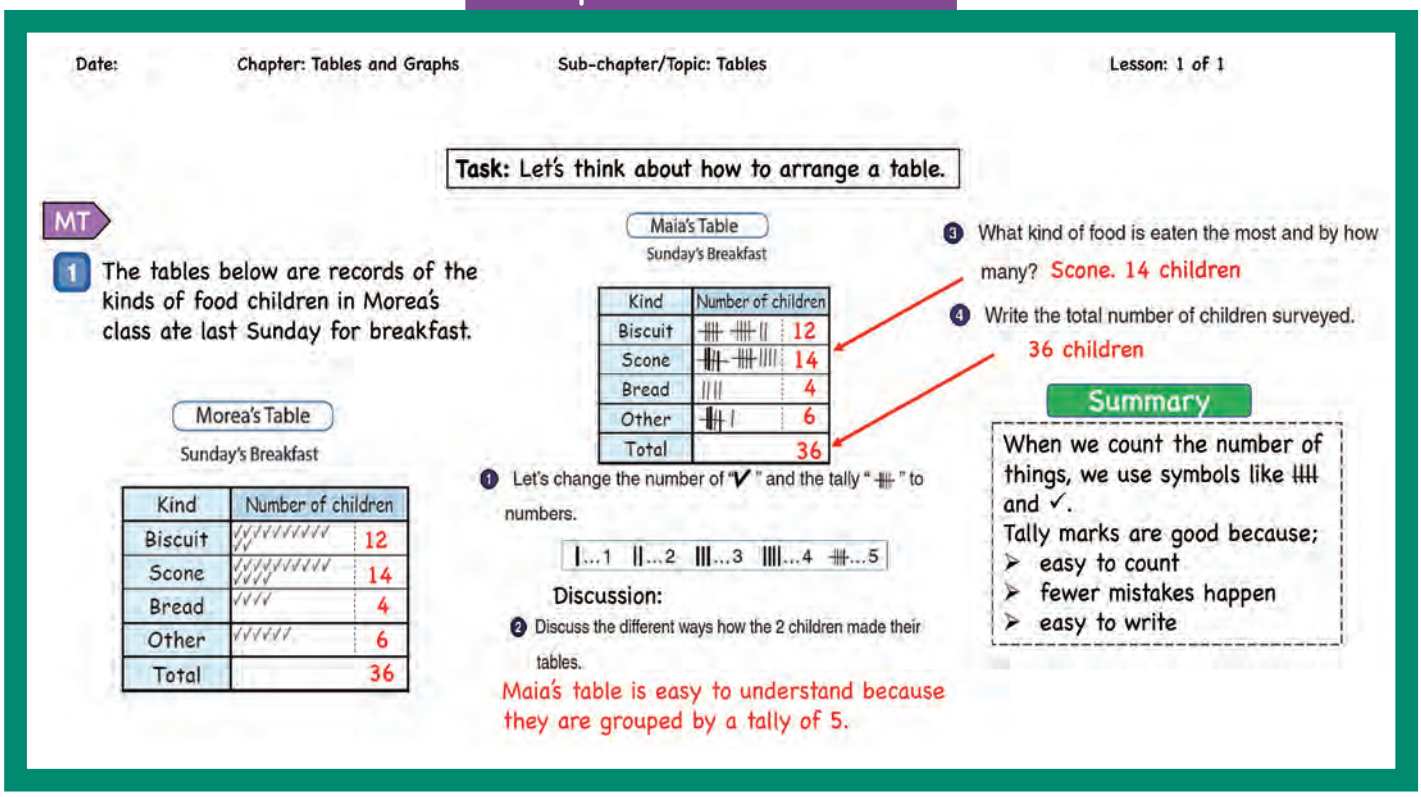
3 ❷ Think about and discuss the good points in each table.

T What do you notice about each table?
S Morea's table we count 1 by 1, Maia's table we count by 5
T Which arrangement is easier to find the total?
S Maia's table because it is grouped by 5 and easy to find the total.

4 ❸❹ Read the table and answer the questions.

T What type of food was eaten the most for breakfast?
S Scone.
T What food was least eaten?
S Bread
T How many students were surveyed?
S 36 students.

Sample Blackboard Plan



Unit 14

Unit: Tables and Graphs
Sub-unit: 2. Bar Graphs
Lesson 1 of 3 (Double Period)

Textbook Page : p.147~p.148
Actual Lesson 101

Sub-unit Objectives

- To understand the relationship between a table and a graph.

Lesson Objectives

- To understand how to read a bar graph.
- To read a bar graph and understand the characteristic of the data.
- To understand the advantage of a table and a bar graph.

Prior Knowledge

- How to arrange the data using a table. (Previous lesson)

Preparation

- Table from previous lesson
- Two types of graph

Assessment

- Read a bar graph and understand the characteristic of the data. F
- Think about the advantages of tables and bar graphs. F
- Understand how to read bar graphs and the term 'bar graph'. S

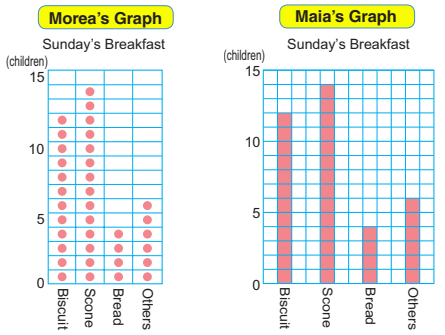
• Teacher's Notes •

A bar graph consists of a series of vertical or horizontal bars representing data.
The purpose of using bar graphs is to interpret different sizes and the difference between the size of quantities, determine maximum and minimum values and to interpret the relationships or overall characteristics of data.

2 Bar Graphs

1 How to read a bar graph

Morea and Maia made the following graphs from the tables in the previous page.



1. How did they represent the number of children?
   Morea uses circles , Maia's uses bars
2. Let's discuss the differences between Morea's graph and Maia's graph.
   Morea's graph, it is difficult when the number becomes large. Maia's graph, it is easy to see because the bar and scale are on same line.
3. Compare the tables in the previous page with the graphs above. Which one makes it the easiest to compare the number of children? Which one makes it the easiest to see the number of children?
   Graph
   Table

A graph which represents the various amounts by the length of bars is called **bar graph**.

How to read a bar graph with larger order and good points

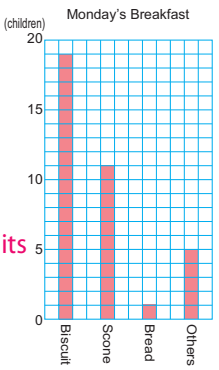
2. Keni changed Maia's graph into this one on the right.

1. How many students ate biscuit, scone, bread and others, respectively?
   Biscuit 14, Scone12, bread 4 and other 6
2. Which kind of food has the largest number of children?
   Biscuit
3. Let's discuss about Keni's graph and how it is different from Maia's graph.
   In Keni's group, items were ordered from larger except the other

In the bar graph, the bars are usually drawn in order from longest to shortest. The "other" bar is usually drawn last.

How to read bar graphs

3. This bar graph shows the number of children and the type of food children ate last Monday.



1. How is this different from the graph for last Sunday?
   Only the number of biscuits increased and the rest decreased.

□×□= 147 148 =□×□

Lesson Flow

1 ① Compare the two graphs.

T ① How did they represent the number of children?
S Morea uses circle and Maia uses bar.
T ② What is the difference of these two?
S In Morea's case, when the number increased you have to draw many circles.
S In Maia's graph, it is easy to see because the number is shown on a bar.

2 ③ Compare the table and the graph.

T Let's compare the table from the previous lesson and the graph. Which one is easy to compare the number of children? and which one is easy to see the number of children?
S Graph is easier to compare the number of children because the number is shown on a bar.
S Table is easier to see the number of children because the number is written as it is.
TN Confirm the following:
Table: It is easy to understand the total number, the number of each categories.
Graph: It is easy to compare among the categories, and understand the overall tendency.

T Introduce the main task.

3 Summarise the bar graph.

T Explain the important point in the box ⬚.

4 ② Solve the problem.

T Solve activity ① ②
T ③ What is the change compared to the previous graph?
S The largest number is drawn from the left and ordered according to the number.
S 'Other' is drawn on the right.
T Explain the important point in the box ⬚.

5 ③ Solve the problem.

T Let's compare two bar graphs, Sunday and Monday. What did you find?
T Give enough time for students to think.
S Arranged from the largest to the least.
S On Sunday, scones is the largest number but on Monday, biscuit is the largest.

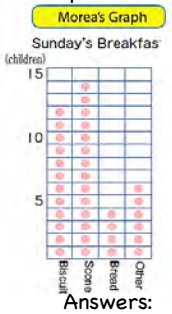
Sample Blackboard Plan

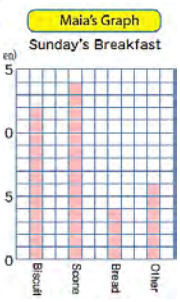
Date: Chapter: Tables and Graphs Sub-chapter/Topic: Bar Graphs Lesson: 1 of 3

Task: Let's think about the characteristics of bar graphs.

Review

① Morea and Maia made the following graphs from the tables in the previous lesson.





Maia's Table
Sunday's Breakfast

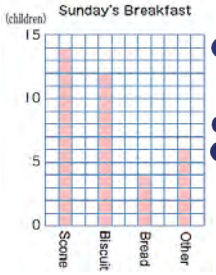
Kind	Number of children
Biscuit	12
Scone	14
Bread	4
Other	6
Total	36

Answers:
① Morea uses circles and Maia uses bars.
② Morea's graph is difficult to read when the number becomes large. Maia's graph is easy to see because the bar and scale are on the same line.

③ Graph makes it easier to compare the number of children.
Table makes it easier to identify the number of children.

MT
A graph which represents the various amounts by the length of bars is called **bar graph**.

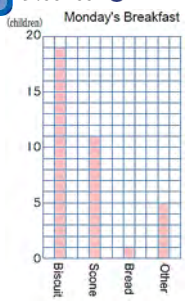
② Keni changed Maia's graph into the one below.



Answers:
① Biscuit 14, Scone 12, bread 4 and others 6.
② Biscuits.
③ In Keni's group, items were ordered from the largest except for others.

In the bar graph, the bars are usually drawn in order from longest to shortest. The "other" bar is usually drawn last.

③ Discuss ①



Answer:
Only the number of biscuits increased and the rest decreased.

Summary

Unit 14

Unit: Tables and Graphs
Sub-unit: 2. Bar Graphs
Lesson 2 of 3 (Single Period)

Textbook Page : p.149
Actual Lesson 102

Lesson Objectives

- To read a bar graph and understand the characteristics of the data.
- To understand that the items are ordered not by amount but by the characteristics of items itself.

Prior Knowledge

- Relationship of the table and a bar graph. (Previous lesson)

Preparation

- A bar graph for task 4

Assessment

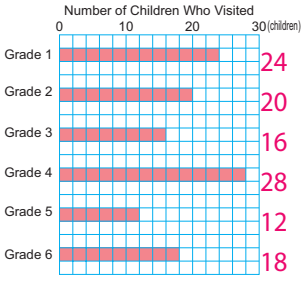
- Read a bar graph and understand the characteristics of the data. F
- Think about 1 scale unit represents how many children. F
- Understand how to read a bar graph concerning the scale unit. S

• Teacher's Notes •

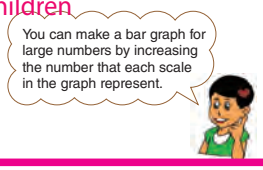
A bar graph is a graph that consists of a series of vertical or horizontal bars representing a data.
To read a bar graph, students need to consider the representation of data according to the bars against the vertical or horizontal units and interpret the scale axis.

How to read a bar graph and its characteristics and good points.

4 Dorah's group recorded the number of children who visited the school nurse. They recorded the number of children in each grade and made a bar graph.



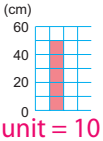
1. How many children are in 1 scale unit of the bar graph? 2 children
2. Let's read the number of children who visited school nurse in each grade.
3. What can we conclude from this bar graph?



When a bar graph shows amounts with given order like grades, the bars are drawn in that order.

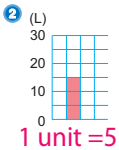
5 In the graphs below, let's read how much is each unit.

1. (cm)



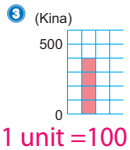
1 unit = 10 cm
50 cm

2. (L)



1 unit =5 L
15 L

3. (Kina)



1 unit =100 kina
400 kina

③ Answers:
Grade 4 has the largest number
Grade 5 has the smallest number
Grades are ordered from Grade 1 to Grade 6

Lesson Flow

1 Review the previous lessons.

T What did we learn in the previous lessons?
TN Let the students present freely what they have learned.
S Relationship between a bar graph and a table. Characteristics of a bar graph.
T Introduce the main task.

2 4 Observe and discuss the difference compared to the previous bar graph.

T 1 Let's observe the bar graph and discuss the difference compared to the previous one.
S Bar is drawn horizontally.
S 1 unit scale does not show 1 child.
T 1 unit scale shows how many children and why?
S 1 unit scale shows 2 children because the scale division between 0 and 10 is 5 units.
T 2 How many children visited the school nurse in each grade?
S Read the graph and respond.
T 3 What can you notice from the graph?
S The items are not ordered by the amount of children but by the grade.
TN The items are ordered by grades but not by amount. When there is an order such as grade, it is easier to see by ordering (from 1st to 6th).
S Explain the data.
T Explain the important point in the box .

3 5 Practice how to read the graph.

S Read the graph by being aware of the amount of each scale unit.

4 Summarise the lesson.

T When you change the amount of a unit scale, you can show any amount as a bar graph.
T Normally, the items are ordered by the amount but when the items have a given order like grades the bars are drawn in the order.

Sample Blackboard Plan

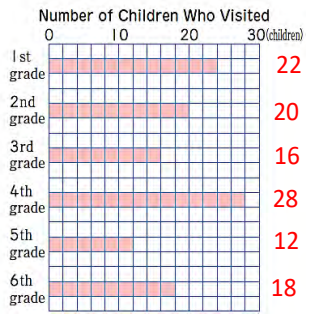
Date: Chapter: Tables and Graphs Sub-chapter/Topic: Bar Graphs Lesson: 2 of 3

Task: Let's read and understand bar graphs.

Review

MT

4 Dora's group recorded the number of children who visited the school nurse. They recorded the number of children in each grade and made a bar graph.



Discuss these questions.

1 How many children are in 1 scale unit of the bar graph?
2 children

2 Read the number of children who visited the school nurse in each grade
Refer to the Graph

3 What can we conclude from this bar graph?
Grades are ordered from Grade 1 to 6
Grade 4 has the largest number
Grade 5 has the smallest number

When a bar graph shows amounts with given order like grades, the bars are drawn in the order.

5 In the graphs below, let's read how much is each unit.

1 (cm) 60 40 20 0
1 unit = 10cm
50cm

2 (L) 30 20 10 0
1 unit= 5L
15 L

3 (kina) 500 0
1 unit = 100 kina
400 kina

Summary

Unit 14

Unit: Tables and Graphs
Sub-unit: 2. Bar Graphs
Lesson 3 of 3 (Double Period)

Textbook Page : p.150~p.151
Actual Lesson 103

Lesson Objectives

- To understand how to draw a bar graph.
- To know the terminologies and their meaning related to bar graph.
- To draw a bar graph considering the scale of 1 unit.

Prior Knowledge

- Arranging data in tables and bar graph.

Preparation

- Graph papers

Assessment

- Practice to draw a bar graph accurately for various data. F
- Draw a bar graph correctly. S

• Teacher's Notes •

Important points when drawing a bar graph

Confirm what we write in horizontal and vertical axis.
We have to decide the scale of each unit considering the largest number.

How to draw a bar graph

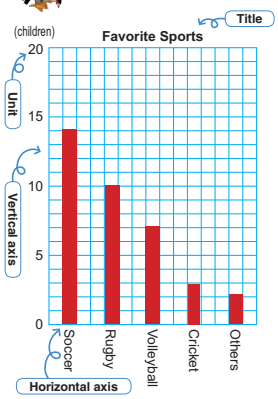
How to Draw a Bar Graph

6 The table on the right shows the favourite sports of 3rd grade children in class one. Let's draw a bar graph.

Favourite Sports

Sports	Number of children
Soccer	14
Rugby	10
Volleyball	7
Cricket	3
Others	2
Total	36

How to Draw a Bar Graph



① Write each sport on the **horizontal axis**.

② Write the number of children on the **vertical axis**.

③ Write the **title** and **unit** of the vertical axis.

④ Draw bars according to the number of students.

Draw a bar graph

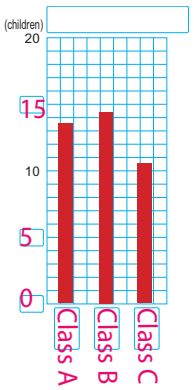
7 We investigated the number of third graders in each class who said their favourite sport was soccer.

Let's draw a bar graph.

Number of Children Who Like Soccer

Class	Number of children
A	14
B	15
C	11
Total	40

Number of children who like soccer



How to draw a bar graph

8 We investigated the favourite sports of all the third graders.

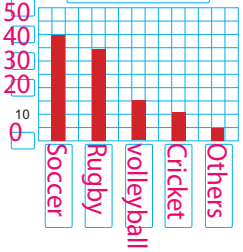
Let's draw a bar graph.

Favourite Sports

Sports	Number of children
Soccer	40
Rugby	35
Volleyball	15
Cricket	10
Others	5
Total	105

How many children should the unit scale of the bar graph be?

(children) Favourite Sports



150 = □ × □

□ − □ = 151

Lesson Flow

1 6 Read the problem and understand the situation.

T What does the table show?
S The table shows the favorite sports in a class.
S Think about how to draw a bar graph.
T Introduce the main task.

2 Discuss how to draw a bar graph.

T What do we have to write in the horizontal axis?
S Items (Name of the sports)
T What do we have to write in the vertical axis?
S Number of children.
T In this case, 1 unit shows how many children?
S 1 child.
T We have to write a title on the top.
T Draw a bar with each item.

3 Discuss the important points when drawing a bar graph.

TN Refer the to teacher's note and the Textbook.

4 7 Draw a bar graph.

T Let students draw a bar graph by confirming each step.
T In horizontal axis, are items ordered by the largest to smallest number or by the class.
S By the class
T In vertical axis, 1 unit shows how many students?
S One student.
T Let's fill in the blanks and draw a bar graph.

5 8 Draw a bar graph.

S Discuss the following points and draw a bar graph.
- The number of children for one unit.
  There are 2 units for evey 10 children so one unit is 5 children.
- The order of items in horizontal axis.
  It is easy to understand when items are ordered from the largest to the smallest number.

Sample Blackboard Plan

Date: Chapter: Tables and Graphs Sub-chapter/Topic: Bar Graphs Lesson: 3 of 3

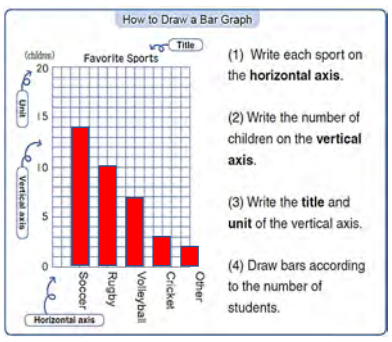
Task: Let's think about how to draw bar graphs.

Review

6 The table shows the favorite sports of 3rd grade children in class. Draw a bar graph.

Favorite Sports

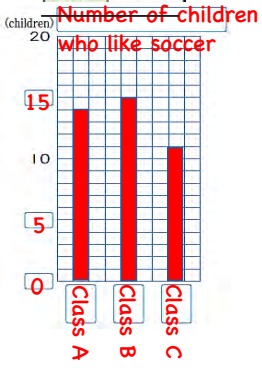
Sports	Number of children
Soccer	14
Rugby	10
Volleyball	7
Cricket	3
Other	2
Total	36



MT

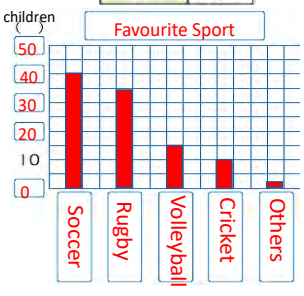
7 Number of children who like soccer.

Class	Number of children
A	14
B	15
C	11
Total	40



8 Favourite Sports

Sports	Number of children
Soccer	40
Rugby	35
Volleyball	15
Cricket	10
Other	5
Total	105



Summary

Unit 14

Unit: Tables and Graphs
Sub-unit: 3. Combining Tables
Lesson 1 of 1 (Double Period)

Textbook Page : p.152~p.153
Actual Lesson 104

Sub-unit Objectives

- To understand how to combine some tables together.

Lesson Objectives

- To combine two tables together for comparing the data.
- To understand the meaning of combined tables and to read it correctly.

Prior Knowledge

- Steps to arrange the data using a table.

Preparation

- Tables for task1

Assessment

- Think about how to combine tables for better understanding of information. F
- Do the exercises correctly. S

• Teacher's Notes •

Students should realise in this lesson that, a set of tables can be combined when the same type of items are being compared on different occasions. In this case, the Item Type remains the same while the data is recorded according to the various times, dates or occasions.

3 Combining Tables

1 How to read a combine table

The following tables show the types of tools and the number of tools that the grade 3 students borrowed in April, May and June.

Tools Borrowed in April

Type of tools	Number of tools
Rake	15
Knife	6
Spade	8
Others	5
Total	34

Tools Borrowed in May

Type of tools	Number of tools
Rake	21
Knife	19
Spade	24
Others	8
Total	72

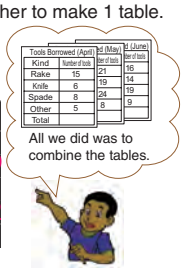
Tools Borrowed in June

Type of tools	Number of tools
Rake	16
Knife	14
Spade	19
Others	9
Total	58

1. What is the total number of tools that were borrowed in each month? April 34 tools, May 72 tools, June 58 tools
2. Which type of tool was borrowed the most in April, May and June? April-Rakes, May-Spade, June-Spade
3. Combine the tables for each month together to make 1 table.

Number of tools Borrowed

Type \ Month	April	May	June	Total
Rake	15	21	16	52
Knife	6	19	14	Ⓓ39
Spade	8	24	19	Ⓔ51
Others	5	8	9	Ⓕ22
Total	Ⓐ	Ⓑ	Ⓒ	Ⓖ
	34	72	58	164



4. How many rakes were borrowed from April to June? 52 Rakes
5. How many tools are in boxes Ⓐ, Ⓑ, Ⓒ, Ⓓ, Ⓔ and Ⓕ? A34, B 72 , C58 , D 39, E 51, F22, G 164
6. What is the meaning of the number in Ⓖ? Total number of tools which were borrowed by Grade 3 students from April to June
7. Which kind of tools was borrowed the most from April to June? Rakes

Exercise

The following table is a record in hospital of the number of children who got sick in April, May and June, and the types of sickness.

① How many children were sick in each month? April 80 children, May 98 children, June 55 children

② What type of illnesses happened the most from April to June? Pneumonia

Records of Sickness

Type \ Month	April	May	June	Total
Malaria	29	27	13	69
Pneumonia	21	46	30	97
Diarrhoea	13	7	4	24
Sore eyes	7	4	2	13
Others	10	14	6	30
Total	80	98	55	233

152 = □ × □

□ + □ = 153

Lesson Flow

1 ① Read and understand the situation.

T There are 3 tables. What does each table show?
S The kind of tools borrowed by 3rd graders in April, May and June.
T ① What is the total number of tools in each month?
S April is 34, May is 72 and June is 58.
T ② What is the largest number of tool borrowed in each month?
S April is Rake, May is Spade and June is Spade.
T Introduce the main task.

2 ③ Think about how to combine three tables for the purpose of showing the data effectively.

T How shall we combine 3 tables together?
TN Allow students to discuss with their small groups and present their ideas.
S Items are same in all tables so we can put the month together horizontally.
T Let's fill in the blank.
TN Let the students fill the number in the combined table by corresponding the numbers in the table of each month.

3 Discuss about the advantages of a combined table.

T What is the advantages of a combined table?
S It is easy to read and compare the number in each month.
S It is easy to understand the total number in each month.

4 Solve the problem ④ to ⑦.

S Solve problems ④ to ⑦ by reading the combined table.

5 Do the exercise.

S Complete the table and answer the questions.

Sample Blackboard Plan

Date: Chapter: Tables and Graphs Sub-chapter/Topic: Combining Tables Lesson: 1 of 1

Task: Let's think about how to read combined tables.

① The tables show tools borrowed in April, May and June .

Tools Borrowed in April

Type of tools	Number of tools
Rake	15
Knife	6
Spade	8
Others	5
Total	34

Tools Borrowed in May

Type of tools	Number of tools
Rake	21
Knife	19
Spade	24
Others	8
Total	72

Tools Borrowed in June

Type of tools	Number of tools
Rake	16
Knife	14
Spade	19
Others	9
Total	58

Number of tools Borrowed

Type \ Month	April	May	June	Total
Rake	15	21	16	52
Knife	6	19	14	Ⓓ 39
Spade	8	24	19	Ⓔ 51
Others	5	8	9	Ⓕ 22
Total	Ⓐ 34	Ⓑ 72	Ⓒ 58	Ⓖ 164

① Total number of tools borrowed each month.
April-34 tools, May-72 tools, June-58 tools

② Tools borrowed the most for each month.
April-rakes, May-spades, June-spades

MT

③ Combine the tables for each month together to make 1 table

④ Rakes borrowed from April to June. 52 rakes

⑤ Number of tools in Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ and Ⓖ.
Refer to answers in the table above.

⑥ Meaning of the number in Ⓖ?
Total number of tools borrowed by Grade 3 students from April to June.

⑦ The tool borrowed the most from April to June. Rakes

Exercise

Summary

Unit 14

Unit: Tables and Graphs
Sub-unit: Exercise and Evaluation
Lesson 1 of 1 (Double Period)

Textbook Page : p.154~p.156
Actual Lesson 105

Lesson Objectives

- To deepen an understanding of the things learned already.

Prior Knowledge

- All the contents in this unit

Preparation

- Evaluation sheets for students

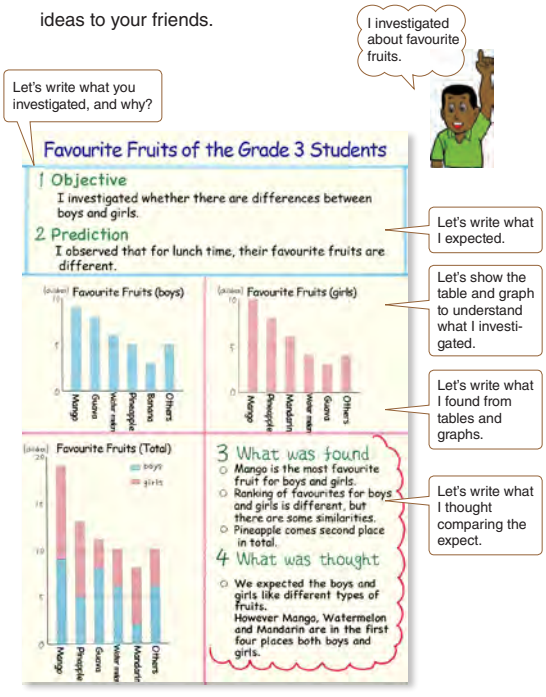
Assessment

- Solve the exercises confirming what they have learned in this unit. F S

For students reading

Report and Present Your Discovery

Compile your report to present your ideas to your friends.



What did you investigate? Let's explain what you investigated using tables and graphs.

154 = □ − □

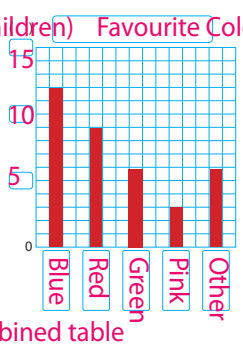
Exercise

1 The following table shows favourite colours of children in Miriam's class. Let's draw a bar graph.

Pages 150 ~ 154

Favourite Colours (Children)

Colour	Number of children
Blue	12
Red	9
Green	6
Pink	3
Other	6
Total	36



How to express combined table

2 The following table shows the number of children who hurt themselves in June at Nathan's school and the type of injuries. Write the correct numbers in the boxes from Ⓐ to Ⓗ .

Pages 152 ~ 153

Records of Injuries (June)

Type \ Grade	1	2	3	4	5	6	Total
Scratch	3	4Ⓑ	2	5	3	4	21
Cut	1Ⓐ	2	2	3	4Ⓔ	3	15Ⓖ
Bruise	1	1	3Ⓒ	2	2	4Ⓕ	13
Other	2	3	1	1	0	2	9
Total	7	10	8	11Ⓓ	9	13	58Ⓗ

□ + □ = 155

Lesson Flow

1 ① Draw a bar graph using table data.

T What shall we write in the horizontal axis?
S Favourite colour.
T How about vertical axis?
S The number of students.
T How many children does 1 unit show?
S The maximum number is 12 so the maximum unit should be 15. Therefore, 1 unit will be 1 child.
TN After drawing the graph, let students confirm the graph with their classmates.

2 ② Complete the table.

T Add all numbers then subtract from the total for each grade to find the missing numbers.
T When adding up the total number horizontally or vertically, we can find the total number of students.

1 ① Think about what you can know from the table and graph.

TN ①: 100 is separated into 5 unit so 1 unit is 20 cans.
②: Read the number on the bar graph and complete the table.
③ · ④: Draw a bar graph by finding the number in the table and compare.
ⓐ: Bar graph has advantages to compare the amount of each item.
ⓑ: Table is better to find the number itself.

2 ② Read the bar graph.

S Discuss what they can know from the bar graph.
T Let the students focus on the minimum and maximum number and the overall tendency.

Problems

How to draw bar graph

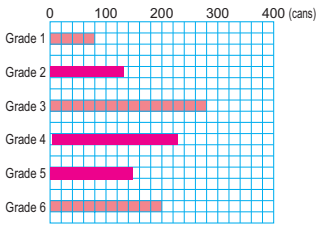
1 Children picked up empty cans at Kaia's school.
The following table shows the number of cans picked up by the children in each grade.

● Reading numbers from table and graph.

Number of Empty Cans Picked Up

Grade	1	2	3	4	5	6	Total
Number of cans	80	120	280	240	160	200	1080

① What does the unit scale show on the graph on the right.
② Let's write the number of empty cans picked up in the above table. 20 cans
③ Let's draw bars for grade 2, 4 and 5 on the graph.
④ Compare the table with the bar graph.



ⓐ Which one makes it easier to read and which grade picked up the most cans? Bar graph
ⓑ Which one makes it easier to read and how many cans did the children in each grade pick up? Table

2 What can you learn from the above bar graph? Write as many points as possible.

● Knowing various things from a graph.

3rd Grade picked the largest number of cans
1st grade picked the smallest number of cans
The order is 3rd, 4th, 6th, 5th, 2nd and 1st grade

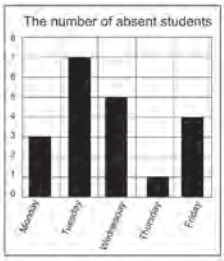
156 =□×□

Math Sentences Using the □ | Name: | Score

1. The bar graph on the right shows the number of students absent in a week. Answer the following questions. (2×10 points)

① How many students were absent on Tuesday?
7 students

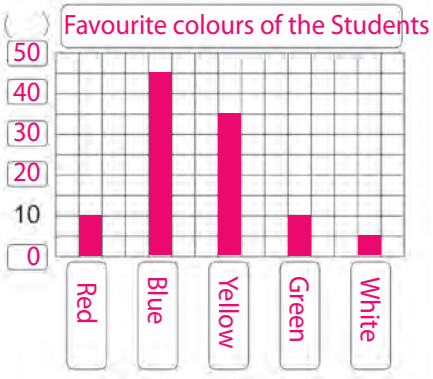
② On which day were the most number of people absent?
Tuesday



2. The table below shows the favourite colour of the students in a school. Draw a bar graph. (Title:10p, Vertical axis: 10p, Horizontal axis: 10p, Each bar:10p)

Favourite Colour of the Students

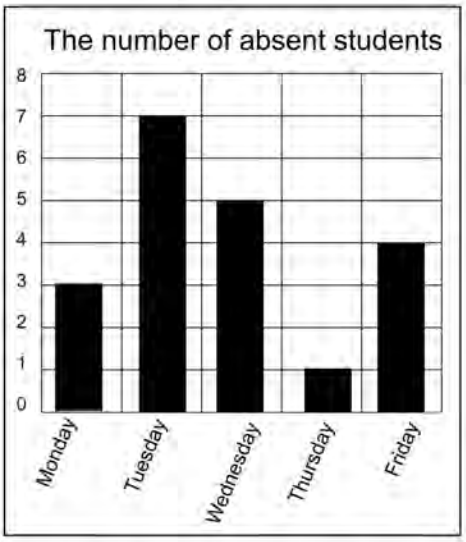
Favourite colour	Number of students
Read	10
Blue	45
Yellow	35
Green	10
White	5



End of Chapter Test: Chapter 14 **Date:**

Math Sentences Using the □	Name:	Score

1. The bar graph on the right shows the number of students absent in a week. Answer the following questions. (2 × 10 points)



① How many students were absent on Tuesday?

_____

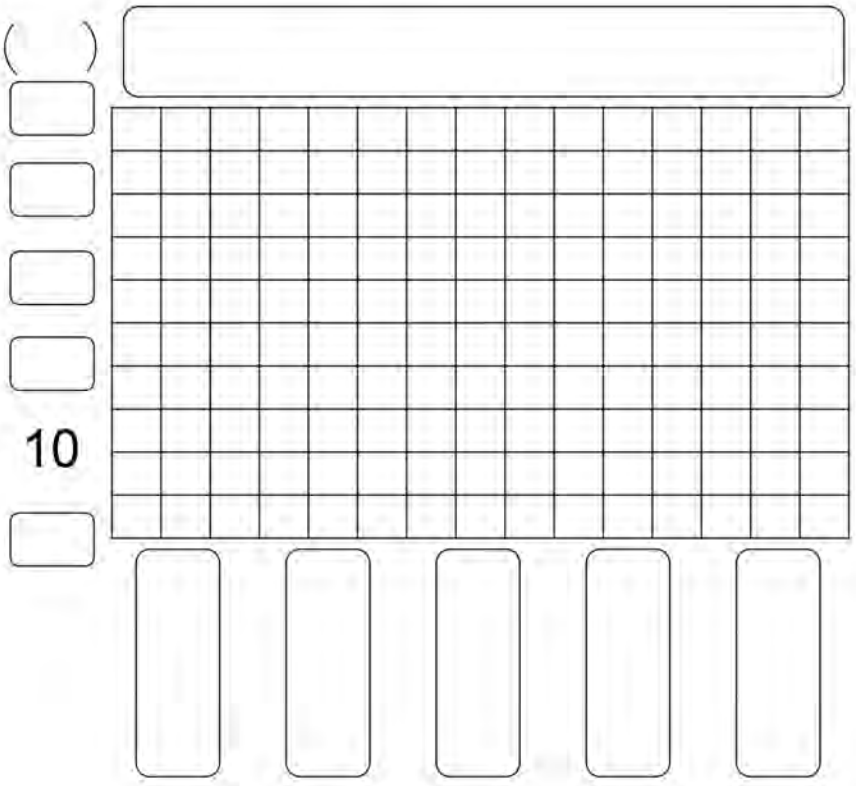
② On which day were the most number of people absent?

_____

2. The table below shows the favourite colour of the students in a school. Draw a bar graph. (Title:10p, Vertical axis: 10p, Horizontal axis: 10p, Each bar:10p)

Favourite Colour of the Students

Favourite colour	Number of students
Read	10
Blue	45
Yellow	35
Green	10
White	5



Chapter 15 Multiplication of 2-digit Numbers

1. Unit Objectives

- To deepen understanding of multiplication and apply the knowledge correctly. (3.1.3a)
- To think about how to calculate (2-digit×(2-digit) and understand that those calculations can be solved by using multiplication table. (3.1.4 c)
- To think about how to calculate (3-digit)×(2-digit). (3.1.4 d)

2. Teaching Overview

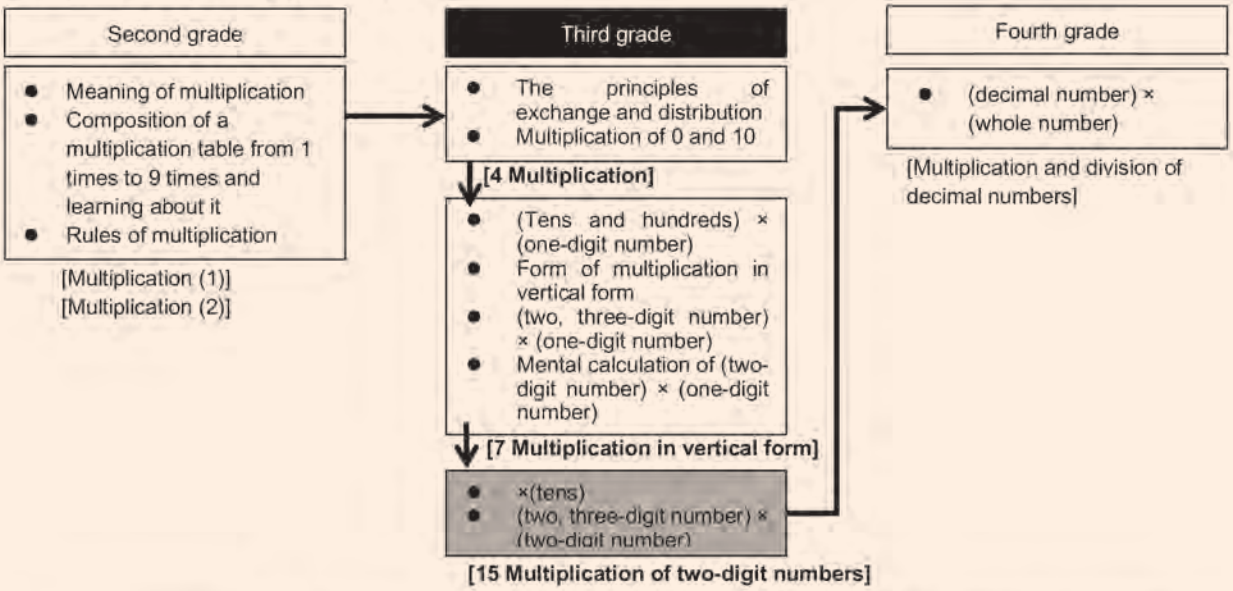
This chapter is the last one for student to learn multiplication of whole numbers so that teachers should be responsible to consolidate students' skills and understanding on it. Based on the understanding, they will learn multiplications and divisions of decimals and fractions in the further grades.

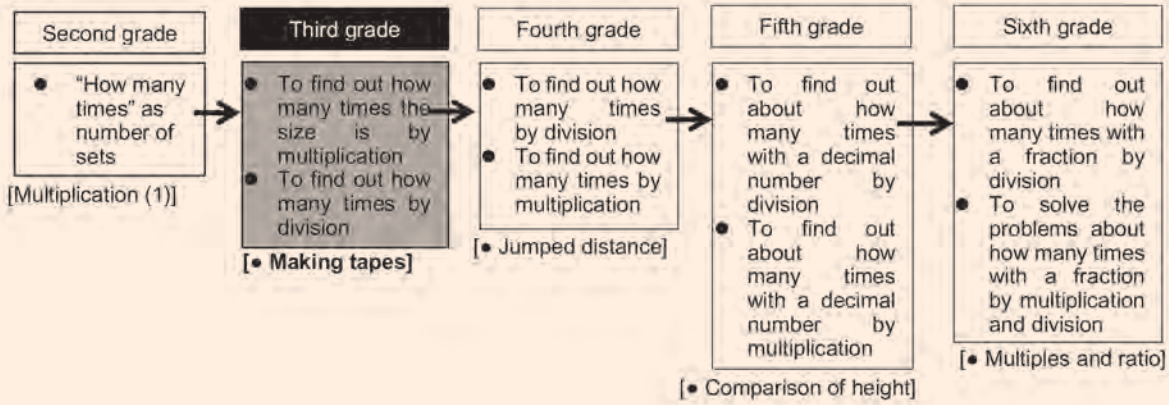
Multiplication by 10s : Students should find that they can apply rules of multiplications for decomposing given multiplications so that they can apply multiplication tables to be memorised.

How to Calculate (2 and 3-digit number) × (2-digit number) : Relate to previous learning.

Making Tapes : Relate to the meaning of multiplication such as (How many sets) × (Number in each set)

3. Related Learning Contents





Unit 15

Unit: Multiplication of 2-digit Numbers
Sub-unit: 1. Multiplication by 20, 30, ….., 90
Lesson 1 of 1 (Double Period)

Textbook Page : p.157~p.158
Actual Lesson 106

Sub-unit Objectives

- To think about how to calculate (1-digit)×(10, 20, …90) and find the product.

Lesson Objectives

- To understand the meaning of (1-digit)×(10, 20, …90) and make mathematical expression.
- To think about how to calculate (10, 20, …90)×(10, 20, …90) based on (1-digit)×(10, 20, …90).

Prior Knowledge

- Multiplication table (Grade 2).
- (2-digit)×(1-digit) in vertical form

Preparation

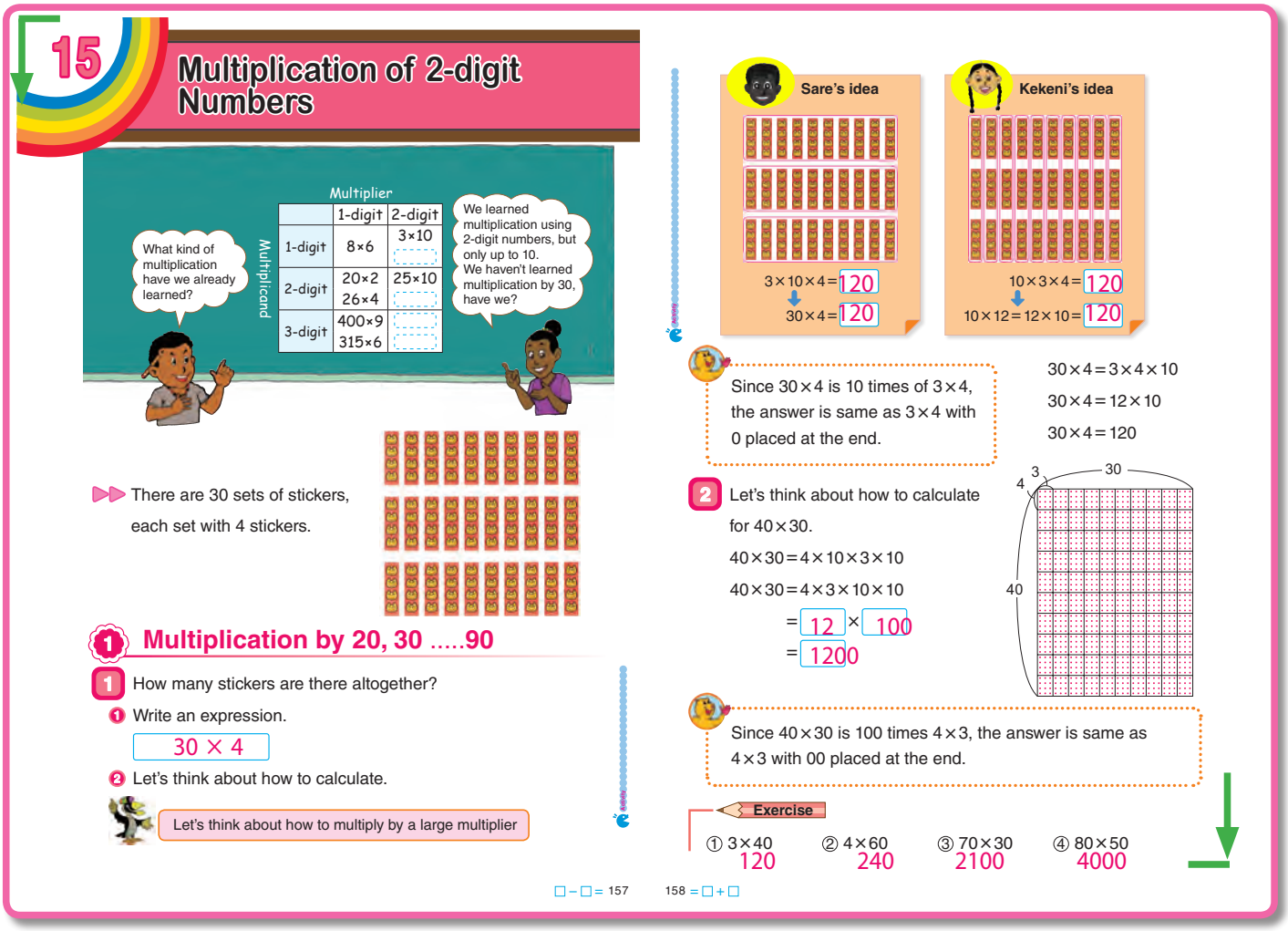
- Chart of Task 1 and 2

Assessment

- Think about how to calculate (10, 20, …90)×(10, 20, …90) based on (1-digit)×(10, 20, …90). F
- Do the exercises correctly. S

• Teacher's Notes •

Mental Calculation was discussed in unit 5. The calculation starts from the superior place value to the ones. In this lesson the mental calculation is expanded to 2-digit by 2-digit, encourage the students to apply their prior knowledge in this lesson.



Lesson Flow

1 ① Read the given problem and understand the situation.

T Read the word problem and think of what we have to find.
T What do we have to find?
S Total number of stickers.

2 ① Make mathematical expression to find total number of stickers.

T What is the mathematical expression to find total number of stickers?
S 30×4

3 ② Think about how to calculate 30×4.

T Explain Sare's idea.
S He finds the number of sticker by row.
T What about Kekeni's idea?
S She finds the number of sticker by column.
T Introduce the main task.

4 Summarise how to calculate 4×30.

T Summarise the 4×30 by using the explanation in the box ( ).
T Let the students notice the common point of Sare and Kekeni is multiplying by 10.
S Understand that the answer is 10 times of 4×3.

5 ④ Think about how to calculate 40×30.

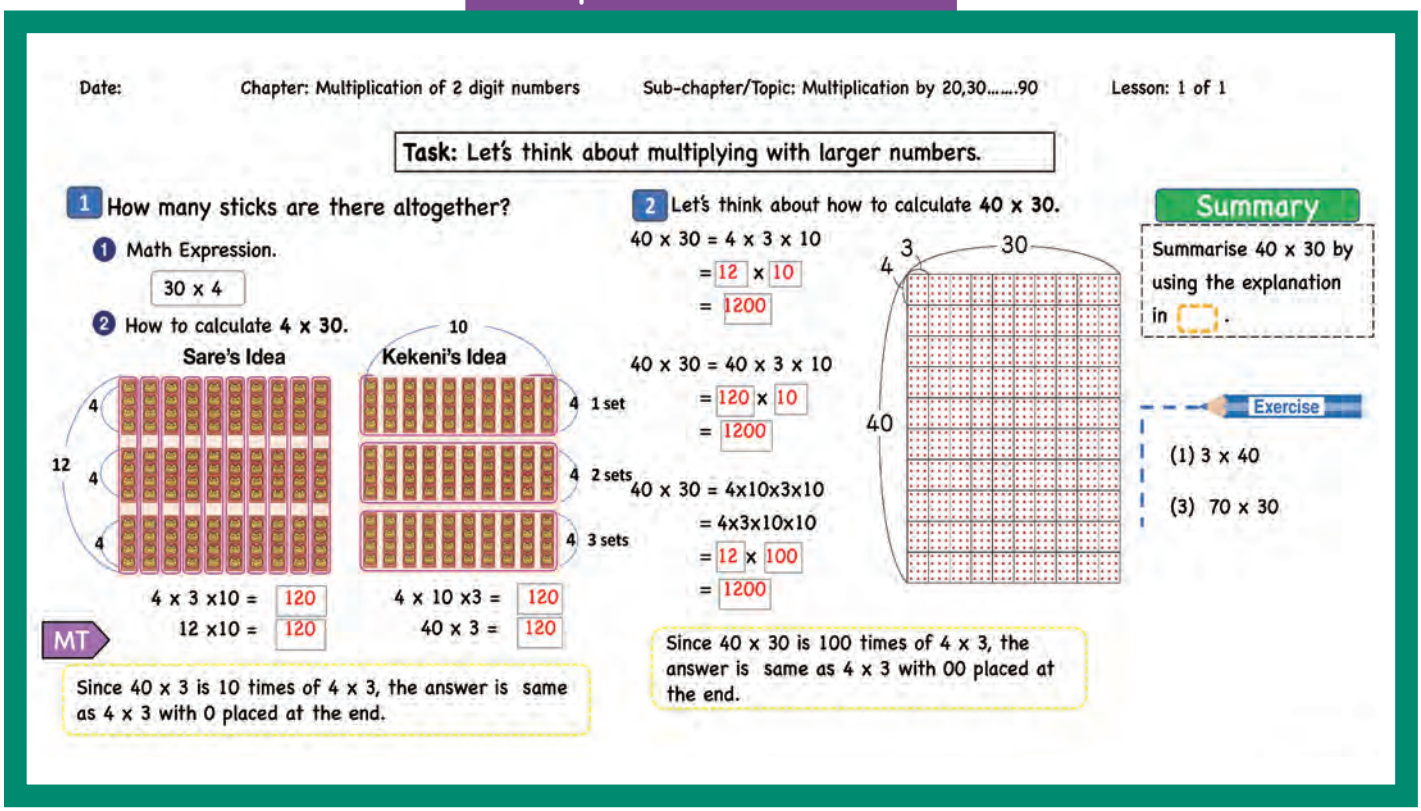
T What is the difference between 4×30 and 40×30?
S 40×30 is 2-digit×2-digit.
T Let the students recognise that calculating 4×3 first and adding two zeros.

6 Summarise how to calculate 40×30.

T Explain the important point in the box ( ).

7 Do the exercise.

Sample Blackboard Plan



Unit 15

Unit: Multiplication of 2-digit Numbers
Sub-unit: 2. How to Calculate(2-digit numbers)×(2-digit numbers)
Lesson 1 of 3 (Double Period)

Textbook Page : p.159
Actual Lesson 107

Sub-unit Objectives

- To find how to calculate (2-digit)×(2-digit) by separating in place value.
- To think about how to calculate (2-digit)×(2-digit) in vertical form.
- To calculate (2-digit)×(2-digit) in vertical form correctly.

Lesson Objectives

- To calculate (2-digit)×(2-digit) by separating in place value.

Prior Knowledge

- Multiplication table (Grade 2)
- (2-digit)×(1-digit) in vertical form
- (10, 20, …90)×(10, 20, …90) (Previous lesson)

Assessment

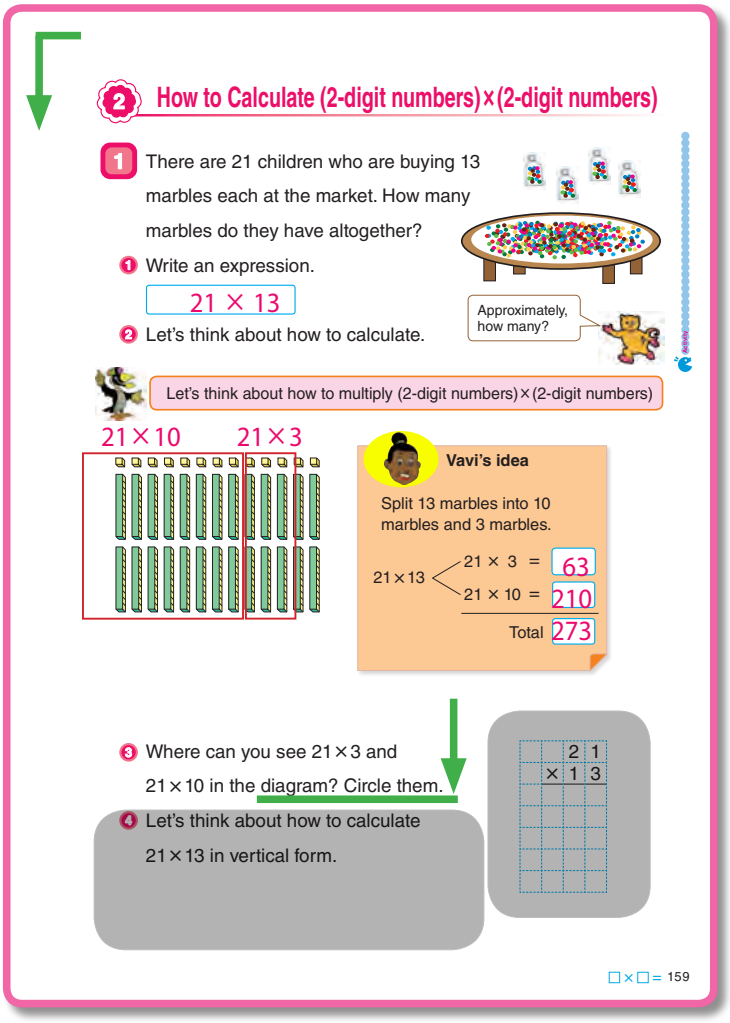
- Think about how to calculate (2-digit)×(2-digit) by separating in place value. F
- Understand how to calculate (2-digit)×(2-digit) by separating in place value. S

Preparation

- Diagram of blocks which is shown in the textbook. (Improvise if necessary) for Black Board

• Teacher's Notes •

Let's think about how to multiply (2-digit)×(2-digit) using the blocks.
Line 13 sets of 21 blocks as shown on the textbook on the board. Allow for students to group the blocks and apply their prior knowledge on multiplication of (2-digit)×(1-digit) to calculate their answer. Guide them to realise that by splitting the blocks into 10 and 3, the calculation does not only become easier, it guides them to use the place values.



Lesson Flow

1 ① ❶ Read the given problem and understand the situation.

T Read the word problem and think of what we have to find.
T What do we have to find?
S Total number of marbles.
T Let's make a math expression.
S 21 × 13
T Let's estimate the answer.
S This is about 20 × 10 so it is around 200.
T Let's think about how to calculate 21 × 13
T Introduce the main task.

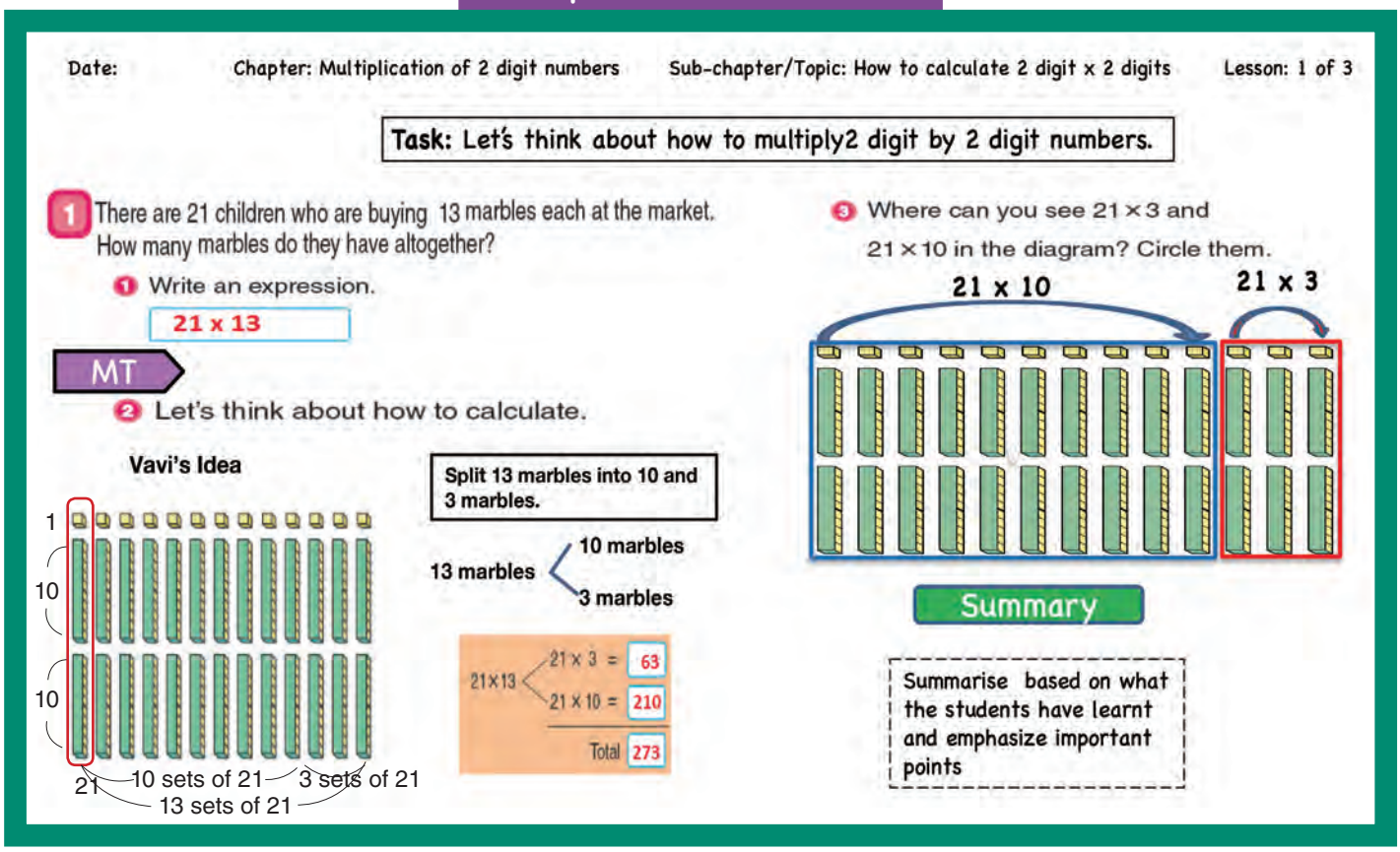
2 ❷ Think about how to calculate 21 × 13.

T Let's consider Vavi's idea. What did she do?
S She separates 13 marbles to 10 and 3. She calculate 21 × 3 and 21 × 10, and add up both answer.

3 ❸ Circle the diagram by 21 × 3 and 21 × 10.

T Let's circle the diagram by 21 × 3 and 21 × 10.
T How many blocks are there in each column?
S 21 blocks.
T How many columns should we circle for 21 × 3?
S 3 columns.
T How many columns should we circle for 21 × 10?
S 10 columns
T 3 column from the right will be 21 × 3 and next 10 rows will be 21 × 10.

Sample Blackboard Plan



Unit 15

Unit: Multiplication of 2-digit Numbers
Sub-unit: 2. How to Calculate(2-digit numbers)×(2-digit numbers)
Lesson 2 of 3 (Single period)

Textbook Page : p.159-160
Actual Lesson 108

Lesson Objectives

- To think about how to calculate (2-digit)×(2-digit) in vertical form.

Prior Knowledge

- How to calculate (2-digit)×(2-digit) (Previous lesson)

Preparation

- Diagram of blocks which is shown in the textbook.
- Use blocks if available.

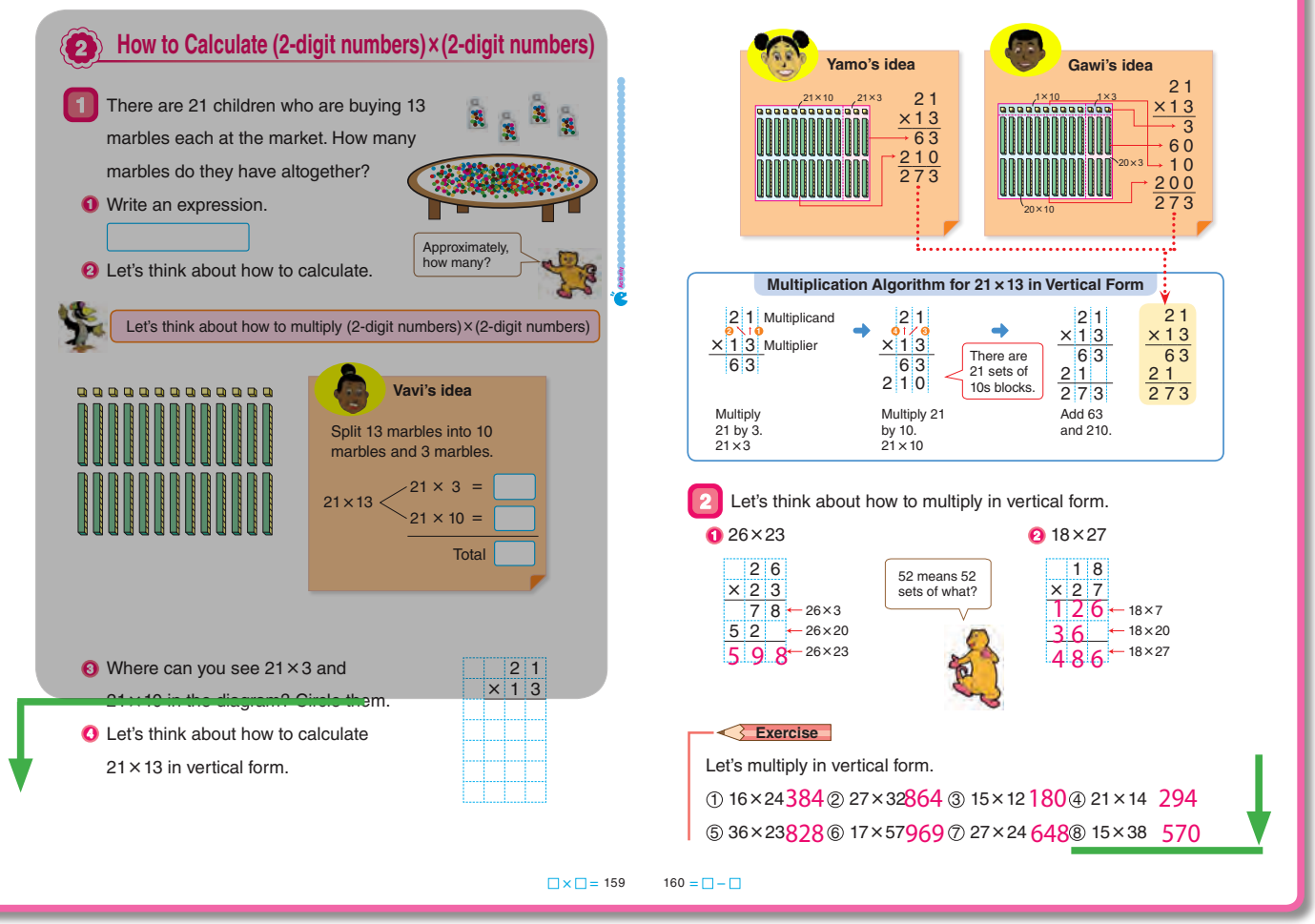
Assessment

- Think about how to calculate (2-digit)×(2-digit) in vertical form. F
- Understand the steps of how to calculate (2-digit)×(2-digit) in vertical form. S

• Teacher's Notes •

How to multiply in vertical form:
1. Keep the numbers in their place values.
2. Multiply from ones to the superior place values.
3. Few students may forget to add the zero to the ones place when multiplying with the sets of ten.
4. The product of (2-digit)×(2-digit) will always be in hundreds.

Example ① 21×13, is 21×3=63 and 21×10=210. ② 26×23, is 26×3=78 and 26×20=520



Lesson Flow

1 Review the previous lesson and understand the today's objective.

T What did we learn in last lesson?
S We learned how to calculate (2-digit)×(2-digit).
T How do we calculate(2-digit)×(2-digit)?
S Separating multiplier by place value, multiply each and add both answers.
T Let's think about how to calculate (2-digit)×(2-digit) in vertical form.
T Introduce the main task.

2 Think about how to calculate 21×13 in vertical form.

T Let's compare Yamo's idea and Gawi's idea.
S Yamo calculates 21×3 and 21×10 and writes in two lines.
S Gawi calculates 21×3 and writes the answer in two lines, and 21×10 and write the answer in two lines.

3 Summarise how to calculate 21×13 in vertical form.

S Explain how to calculate 21×13 step by step following the summary in the textbook.
S Write the summary of the calculation in their exercise books.
S Calculate 21×13 again by themselves in their exercise books.

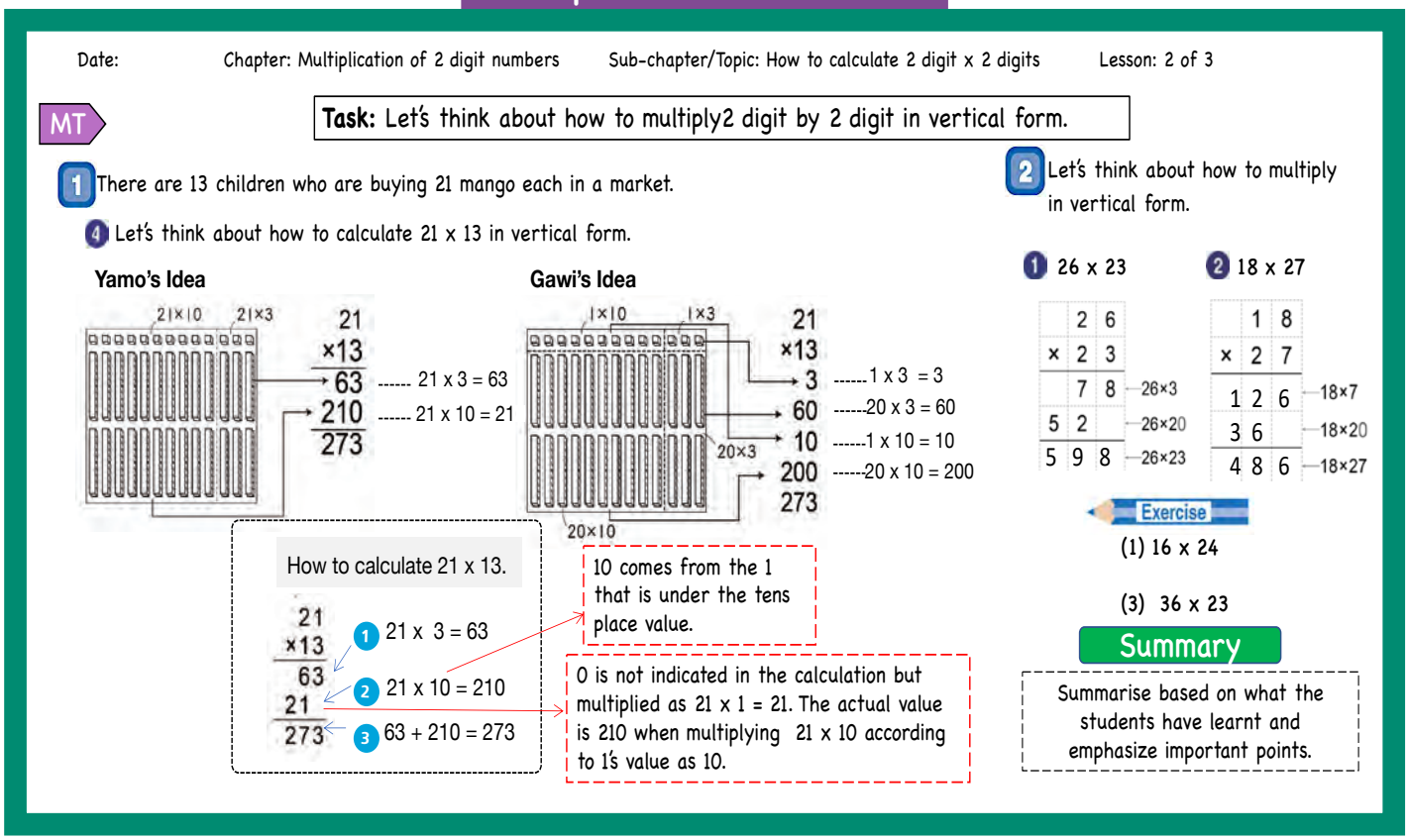
4 ② Calculate 26×23 and 18×27

T Let's calculate 26×23 and 18×27 in vertical form.
S Do the exercises ① and ②.
TN Give some time to students to think individually.
S Present ideas with explanation.
TN Confirm that 52 means 52 sets of 10 which is 520.

5 Complete the exercise.

There are 8 exercises. Ask students who finish early to do more. The rest can be given as a home work.

Sample Blackboard Plan



Unit 15

Unit: Multiplication of 2-digit Numbers
Sub-unit: 3. How to Calculate(2-digit numbers)×(2-digit numbers)
Lesson 3 of 3 (Double period)

Textbook Page : p.161
Actual Lesson 109

Lesson Objectives

- To practice and master the calculation of (2-digit)×(2-digit) in vertical form.

Prior Knowledge

- How to calculate (2-digit)×(2-digit) in vertical form. (Previous lesson)

Preparation

- Refer to the blackboard Plan.

Assessment

- Practice the calculation of (2-digit)×(2-digit) in vertical form. F
- Do the exercise correctly. S

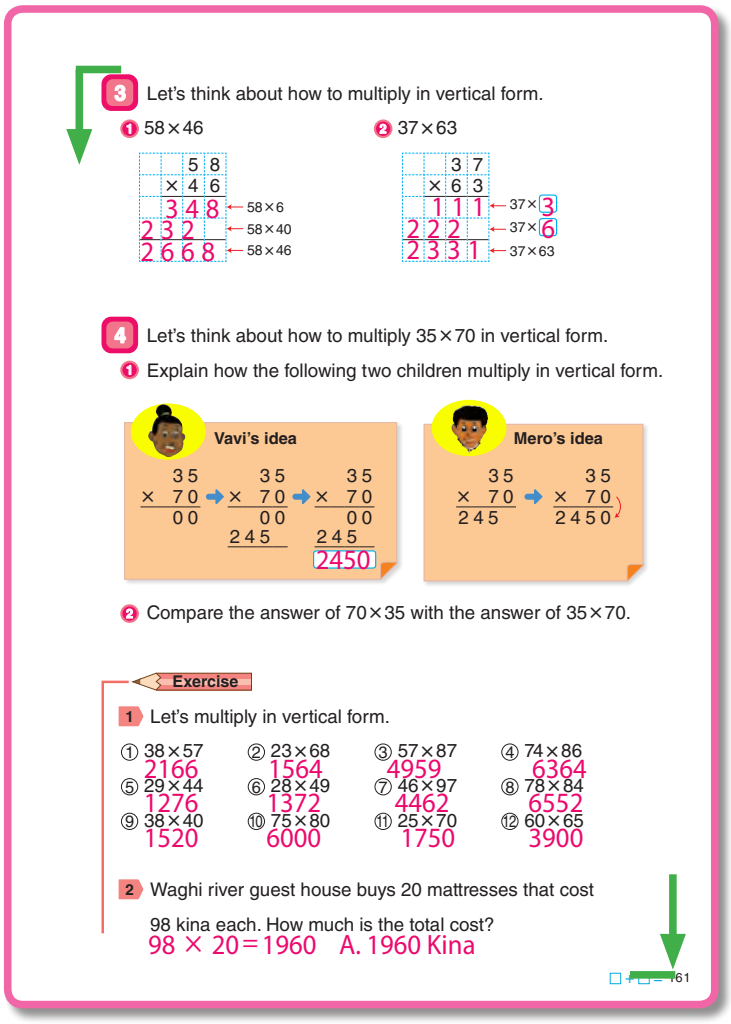
• Teacher's Notes •

Exercise

①~④: Product of Multiplication in ones place becomes 3-digit.

⑤~⑧: Partial multiplication has carrying over.

①~⑫: Ones place of multiplicand is 0.



3 Let's think about how to multiply in vertical form.

① 58×46

	5	8
×	4	6
	3	4	8	← 58×6
2	3	2		← 58×40
2	6	6	8	← 58×46

② 37×63

		3	7
×		6	3
	1	1	1	← 37×3
2	2	2		← 37×6
2	3	3	1	← 37×63

4 Let's think about how to multiply 35×70 in vertical form.

① Explain how the following two children multiply in vertical form.

Vavi's idea

	3	5		3	5		3	5
×	7	0	→ ×	7	0	→ ×	7	0
	0	0			0	0		0	0
				2	4	5	2	4	5
							2	4	5	0

Mero's idea

	3	5		3	5
×	7	0	→ ×	7	0
2	4	5	2	4	5	0

② Compare the answer of 70×35 with the answer of 35×70.

Exercise

1 Let's multiply in vertical form.

① 38×57 2166	② 23×68 1564	③ 57×87 4959	④ 74×86 6364
⑤ 29×44 1276	⑥ 28×49 1372	⑦ 46×97 4462	⑧ 78×84 6552
⑨ 38×40 1520	⑩ 75×80 6000	⑪ 25×70 1750	⑫ 60×65 3900

2 Waghi river guest house buys 20 mattresses that cost 98 kina each. How much is the total cost?

98 × 20 = 1960 A. 1960 Kina

□+□=161

Lesson Flow

1 ③ Calculate 58×23 and 37×63.

T Introduce the main task.
T ①-② Let's calculate 58×46 and 37×63 in vertical form.
TN Give some time to students to think individually.
TN Product of each place value becomes 3-digit.
T Confirm the answer together.

2 ④ Think about how to calculate 35×70.

T ① Let's compare Vavi's idea and Mero's idea.
S Vavi calculated as we learned so she wrote the answer of 5×0 and 3×0 but Mero abbreviated the calculation of 35×0 because answer becomes 0.
T Mero's idea is easier but we must not forget to put 0 in the ones place.

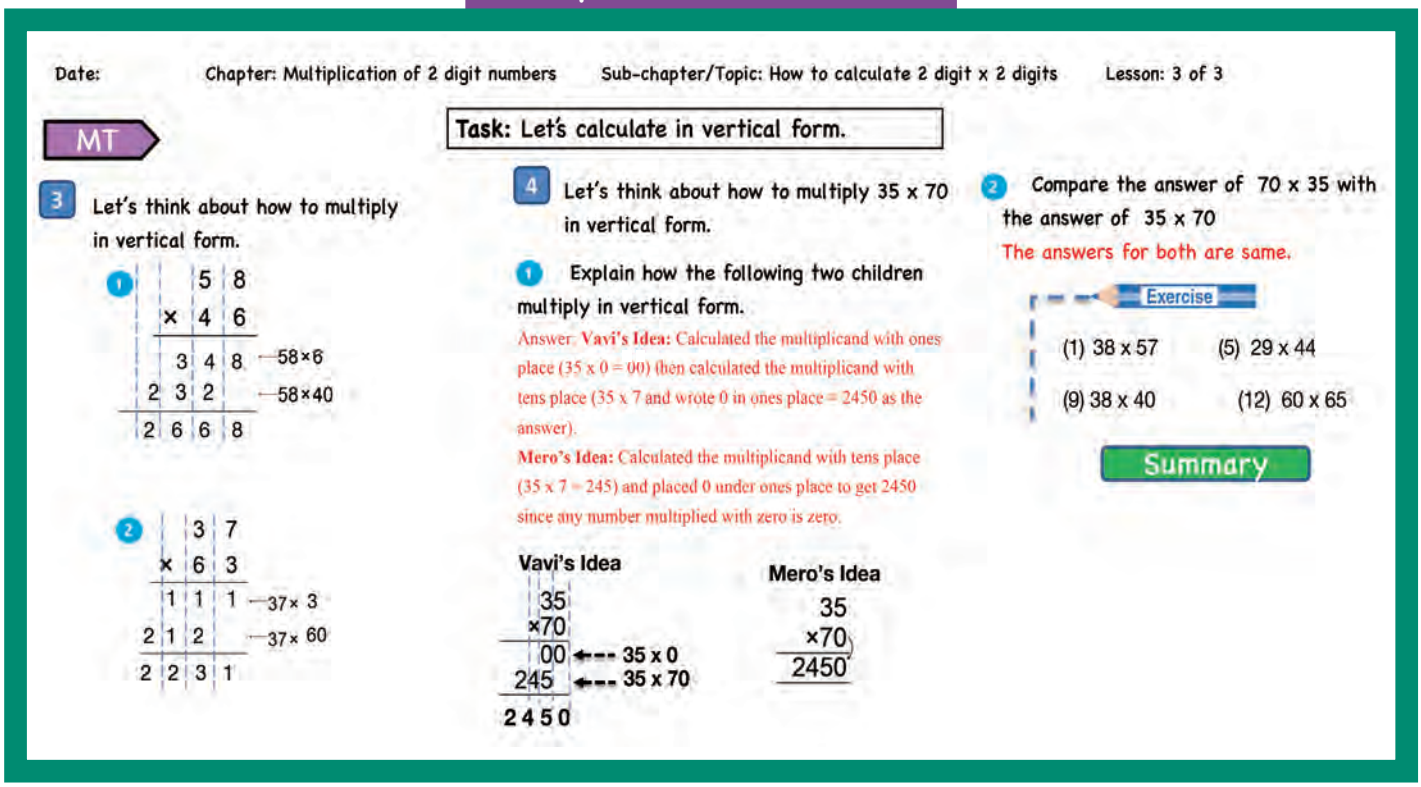
3 ② Compare the answer of 35×70 and 70×35.

S Calculate 35×70 and 70×35 in their exercise book.
T What is the answer?
S Both are 2450.

4 Do the exercise.

T Do the exercises ①, ⑤ and ⑨
TN There are 12 exercises. Ask students who finish early to do more. The rest can be given as a home work.

Sample Blackboard Plan



Unit 15

Unit: Multiplication of 2-digit Numbers
Sub-unit: 3. How to Calculate(2-digit numbers)×(2-digit numbers)
Lesson 1 of 2 lessons (Single period)

Textbook Page : p.162
Actual Lesson 110

Sub-unit Objectives

- To find method of calculation (3-digit)×(2-digit) based on (2-digit)×(2-digit).
- To calculate (3-digit)×(2-digit) in vertical form.
- To do mental calculation of (2-digit)×(1-digit).

Lesson Objectives

- To calculate (3-digit)×(2-digit) separating into place value.
- To calculate (3-digit)×(2-digit) in vertical form.

Prior Knowledge

- How to calculate (2-digit)×(2-digit) in vertical form.

Preparation

- Refer to blackboard plan.

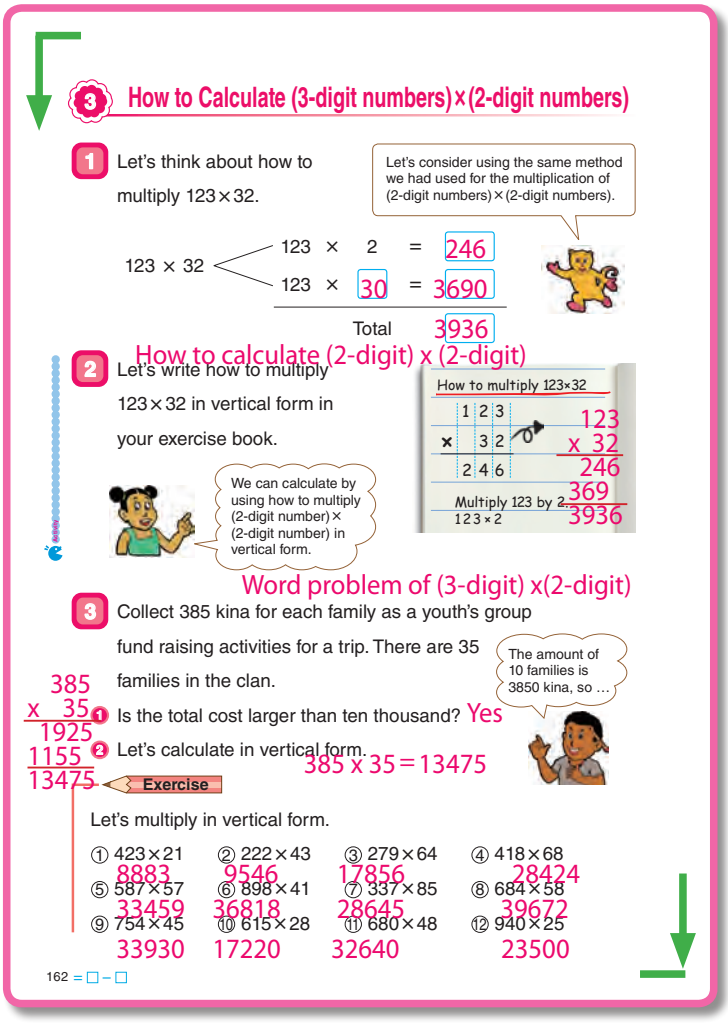
Assessment

- Think about how to calculate (3-digit)×(2-digit) in vertical form. F
- Do exercise correctly. S

• Teacher's Notes •

Exercises

① and ②: Product becomes 4-digit.
③~⑧: Product becomes 5-digit
⑨ and ⑫: Ones place of product becomes 0.
⑪ and ⑫: Ones place of multiplier is 0



3 How to Calculate (3-digit numbers)×(2-digit numbers)

1 Let's think about how to multiply 123×32.

Let's consider using the same method we had used for the multiplication of (2-digit numbers)×(2-digit numbers).

123 × 32
123 × 2 = 246
123 × 30 = 3690
Total 3936

How to calculate (2-digit) x (2-digit)

2 Let's write how to multiply 123×32 in vertical form in your exercise book.

How to multiply 123×32
1 2 3
× 3 2
2 4 6
123 x 32 246 369 3936
Multiply 123 by 2
123×2

We can calculate by using how to multiply (2-digit number)×(2-digit number) in vertical form.

Word problem of (3-digit) x(2-digit)

3 Collect 385 kina for each family as a youth's group fund raising activities for a trip. There are 35 families in the clan.

The amount of 10 families is 3850 kina, so …

385 x 35
1 Is the total cost larger than ten thousand? Yes
1925
2 Let's calculate in vertical form.
1155
13475
385 x 35 = 13475

Exercise

Let's multiply in vertical form.

① 423×21 8883
② 222×43 9546
③ 279×64 17856
④ 418×68 28424
⑤ 587×57 33459
⑥ 898×41 36818
⑦ 337×85 28645
⑧ 684×58 39672
⑨ 754×45 33930
⑩ 615×28 17220
⑪ 680×48 32640
⑫ 940×25 23500

162 = □ − □

Lesson Flow

1 ① Think about how to calculate 123×32.

T How should we calculate when multiplier is 3-digit.
S It is the same as (2-digit)×(2-digit). We calculate 123×2 and 123×30 and add up both products.
TN Emphasise the value of 3.
3 represent 30 since it is in the tens place value. The product should be written with 0 in the ones place.
T Introduce the main task.

2 ② Summarise how to calculate 123×32.

T Let's summarise how to calculate 123×32 in your exercise book referring to the textbook.
S Calculate in their exercise book and confirm the steps by themselves.

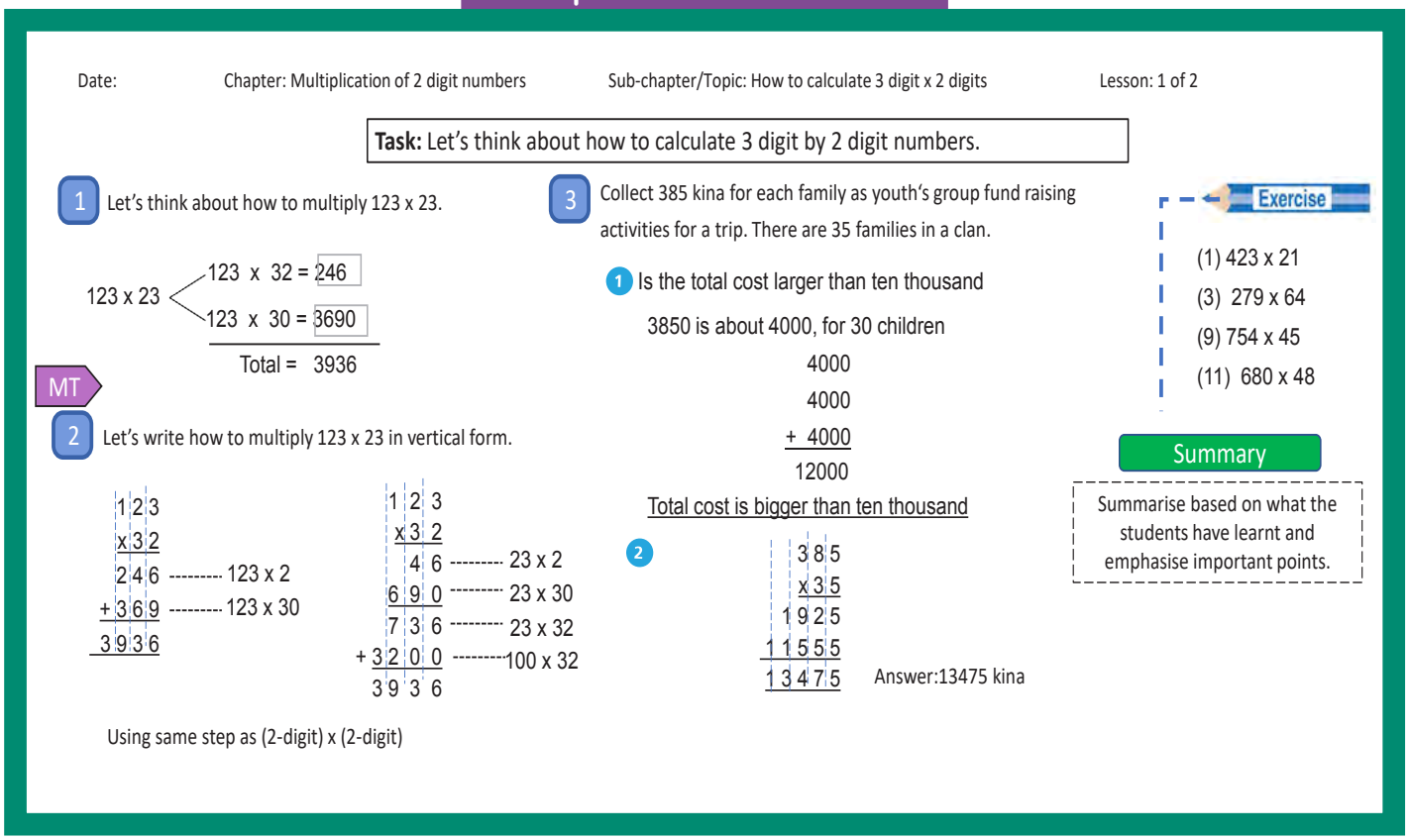
3 ③ Solve the word problem.

S Read and understand the situation.
T What is the mathematical expression?
S 385×35
T Is the answer larger than 10 000?
S Estimate the digit of answer for improving their number sense.
S 385 is around 400. 35 is around 30 or 40. So when multiplying 2 numbers, the answer will be over 10000
S Calculate and find the answer in your exercise book.

4 Do the exercise at the end of the lesson.

S Do the exercise ①, ③, ⑨ and ⑪.
TN There are 12 exercises. Ask students who finish early to do more. The rest can be given as a home work.

Sample Blackboard Plan



Unit 15

Unit: Multiplication of 2-digit Numbers
Sub-unit: 3. How to Calculate(2-digit numbers)×(2-digit numbers)
Lesson 2 of 2 (Single period)

Textbook Page : p.163
Actual Lesson 111

Lesson Objectives

- To calculate (3-digit)×(2-digit) with 0.
- To do mental calculation of (2-digit)×(1-digit).

Prior Knowledge

- How to calculate (3-digit)×(2-digit) in vertical form. (Previous lesson)

Preparation

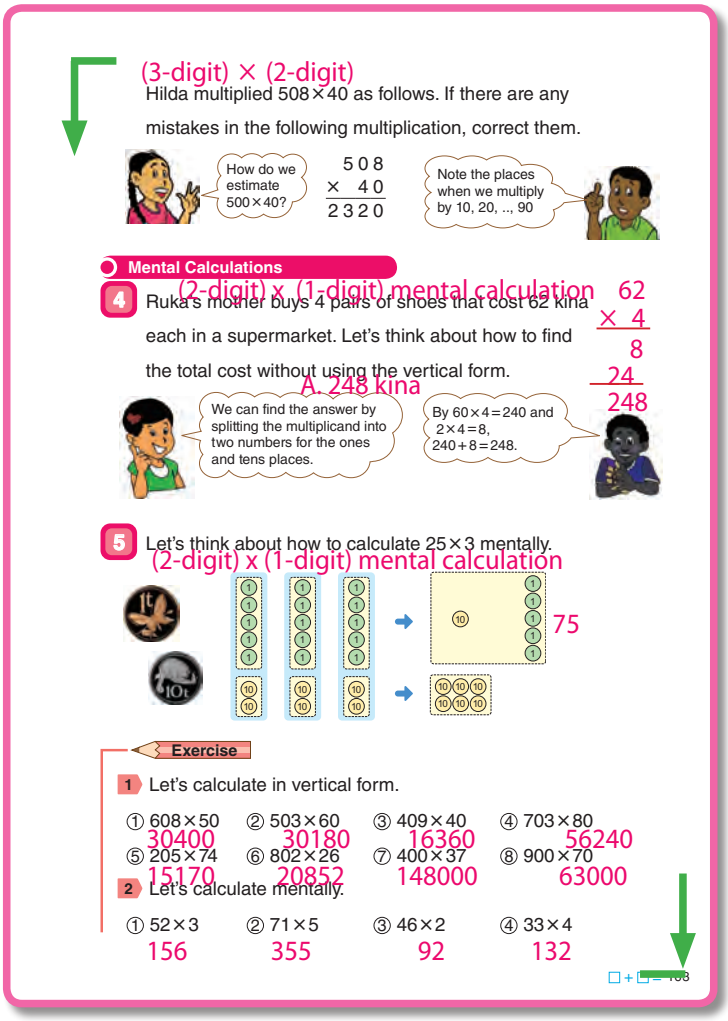
- Refer to the blackboard Plan.

Assessment

- Calculate (3-digit)×(2-digit) with 0. F
- Think about how to do mental calculation of (2-digit)×(1-digit). F
- Do exercise correctly. S

• Teacher's Notes •

Mental calculation is necessary for students to apply when dealing with situations in their daily lives. Encourage students to expand their skill from (2-digit)×(1-digit) by using the splitting method and multiply 0.



Lesson Flow

1 4 Think about how to calculate 508×40.

T Introduce the main task.
T Let's calculate 508×40 being aware of 0.
T The answer will be how many digit ?
S Because it is about 500×40 so answer will be 5-digit.
T Get the students to calculate and find the answer.
S 20320
T What is wrong with Hilda's answer?
S I think she forgot to put 0 after 2.

2 5 Think about how to do mental calculation of 62×4.

T Let students think about 60×4 and 2×4 seperately, then add up both answers.
S 60×4=240 and 2×4=8 so the 240+8=248.
T Get the students to notice that if we separate multiplicand into 2 numbers we can calculate easily by only using the knowledge of the multiplication table.

3 6 Think about how to do mental calculation of 25×3.

T Observe the diagram and think about how it is calculated.
S 25 is separated into 5 and 20. Calculating 5×3=15 and 20×3=60. Adding up both answers.

4 Do the exercise at the end of the lesson.

S Do exercises 1 ①, ⑤, ⑦ and ⑧.
Do exercise 2 ① and ②.
TN Ask students who finish early to do more. The rest can be given as a home work.

Sample Blackboard Plan

Date: Chapter: Multiplication of 2 digit numbers Sub-chapter, Topic: How to calculate 3 digit x 2 digits Lesson: 2 of 2

MT

Task: Let's calculate in vertical form.

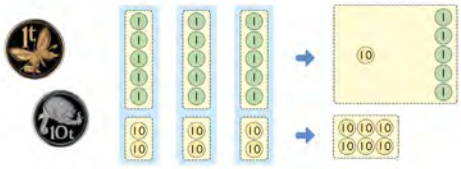
Hilda multiplied 508 x 40 as follows. If there are any mistakes in the following multiplication, correct it..

- When we estimate as 500 x 40 answer is 2000

508
x 40
20320

Calculate being aware of 0

5 Let's think about how to calculate 25 x 3 mentally.



Refer to Textbook utilize the diagram.

- Separate 25 into 20 and 5

5 x 3 = 15
20 x 3 = 60
Total 75

Exercise

(1) 608 x 50 (5) 205 x 74
(7) 400 x 37 (8) 900 x 70

Summary

Summarise based on what the students have learnt and emphasise important points.

4 Ruka's mother buys 4 pairs of shoes that cost 62 kina each in a supermarket. Let's think about how to find the total cost without using the vertical form.

- Separate 62 into 60 and 2

2 x 4 = 8
60 x 4 = 120
Total 128

Unit 15

Unit: Multiplication of 2-digit Numbers
Sub-unit: Exercise and Evaluation
Lesson 1 of 1(Double Period)

Textbook Page : p.164- p.165
Actual Lesson 112

Lesson Objectives

- To deepen understanding of what they learned in this unit.

Prior Knowledge

- All the contents in this unit.

Preparation

- Evaluation sheets for the students.

Assessment

- Enjoy solving exercises deepening understanding of what they learned. F
- Confirm whether they can solve problems correctly and master the concepts. S

• Teacher's Notes •

Use 30 minutes for the exercise and give the evaluation test after that.

Exercises

1 Let's calculate. Pages 158 ~ 159

① 5×20 100	② 60×30 1800	③ 40×50 2000
④ 22×14 308	⑤ 19×31 589	⑥ 27×28 756
⑦ 36×43 1548	⑧ 67×58 3886	⑨ 73×47 3431
⑩ 25×84 2100	⑪ 48×60 2880	⑫ 30×92 2760

2 There are 34 children in Rataera's class. Each child studies 75 minutes after school. How many minutes did they study altogether? Page 162

75 × 34 = 2550
A. 2550 minutes

3 Let's make problems by filling in the ☐ with a number. Page 162

① 321 × 23 = 963 + 642 = 7383

② 986 × 54 = 3944 + 4930 = 53244

164 = □ − □

Problems

1 Summarise how to multiply 45×63.
● Understanding how to calculate in vertical form.

① Add the answers of 45×3 and of 45×60.

② ⓐ is from the multiplication of 45 × 3.

③ ⓑ is from the multiplication of 45 × 60, and it means 270 sets of 10.

```
  45
× 63
 135 ← ⓐ
270  ← ⓑ
2835
```

2 Are the following calculation in vertical form correct? If there are any mistakes in the following multiplications, correct them.
● Multiplying in appropriate ways.

① 54 × 94 = 206 + 4560 = 4766 → 54 × 94 = 216 + 4860 = 5076

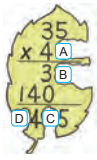
② 408 × 65 = 240 + 2880 = 3120 → 408 × 65 = 2040 + 24480 = 26520

3 You need 43 sheets of papers to make each collection of work. You made 38 collections of work. How many sheets of paper are there altogether?
● Express a problem as an expression and finding the answer.

43 x 38 = 1634 A. 1634 papers

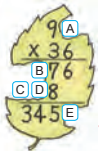
4 Let's write numbers in the spaces below.
● Understanding the structure of multiplication and solving problem.

①



35 × 41 = 35 + 140 = 1435

②



96 × 36 = 576 + 288 = 3456

□ × □ = 165

Lesson Flow

1 ① Practice of multiplication (1-digit)×(2-digit), (2 or 3-digit)×(2-digit)

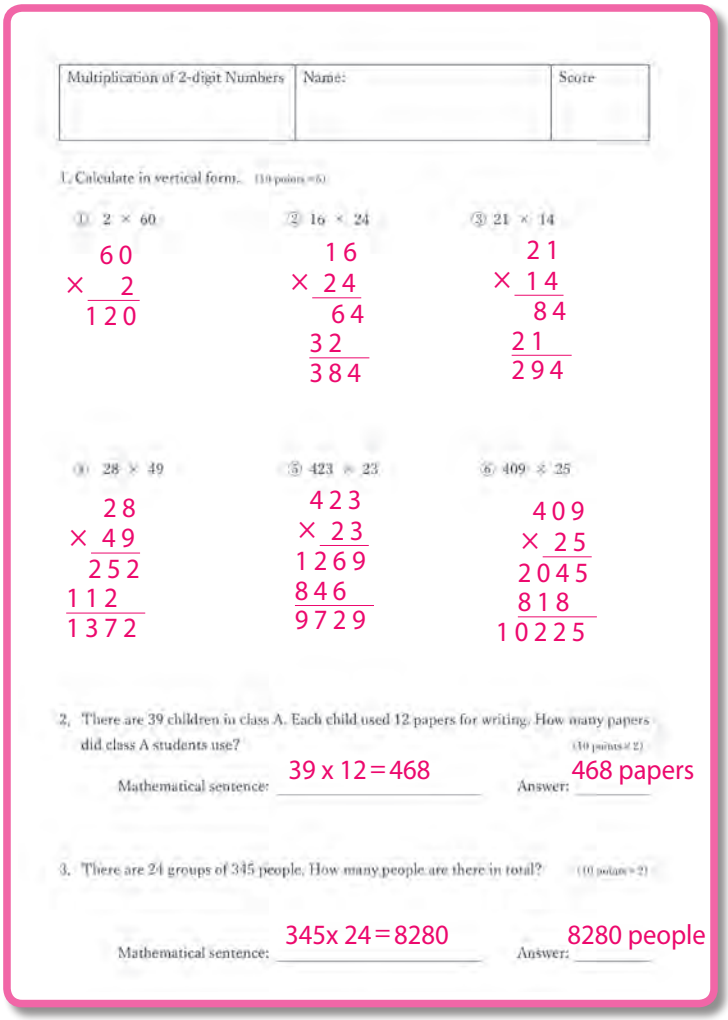
TN ①: (1-digit)×(several tens)
②and ③: (several tens)×(several tens)
④: There is no carrying over in partial multiplication.
⑤ and ⑥: There is carrying over in partial multiplication.
⑦~⑩:Partial multiplication becomes 4-digit.
⑪ and ⑫: (2-digit)×(several tens) and (several tens)×(2-digit).

TN Choose the questions to let students solve in the class. The rest can be homework.

2 ② Solve a word problem.

TN Let students read and understand the situation appropriately before making mathematical expression.

3 ③ Make multiplication in vertical form by inserting number in □.



Multiplication of 2-digit Numbers | Name: | Score

1. Calculate in vertical form. (10 points×6)

① 2 × 60
60 × 2 = 120

② 16 × 24
16 × 24 = 64 + 32 = 384

③ 21 × 14
21 × 14 = 84 + 21 = 294

④ 28 × 49
28 × 49 = 252 + 112 = 1372

⑤ 423 × 23
423 × 23 = 1269 + 846 = 9729

⑥ 409 × 25
409 × 25 = 2045 + 818 = 10225

2. There are 39 children in class A. Each child used 12 papers for writing. How many papers did class A students use? (10 points×2)

Mathematical sentence: 39 x 12=468 Answer: 468 papers

3. There are 24 groups of 345 people. How many people are there in total? (10 points×2)

Mathematical sentence: 345x 24=8280 Answer: 8280 people

TN ①: (3-digit)×(2-digit), both partial multiplication become 3-digit.
②(3-digit)×(2-digit), both partial multiplication become 4-digit.

4 ① Confirm the steps of 45×63.

TN Calculate by separating place value.
45×3=135
45×60=2700
135+2700=2835

5 ② Correct mistakes of calculation.

S Find the mistakes after calculating the operation.

6 ③ Solve a world problem.

TN Let students read the problem and understand the situation correctly before making mathematical expression.

7 ④ Fill in the blank.

TN It is difficult for some students to find the numbers. Explain how to think about the number by focusing on the structure of multiplication in vertical form. For example, concerning A and B, when we look at the product, it is 5, so A becomes automatically 1 and B is 5.

Unit 15

Unit: Multiplication of 2-digit Numbers
Sub-unit: Making Tapes
Lesson 1 of 2 (Single Period)

Textbook Page : p.166
Actual Lesson 113

Sub-unit Objectives

- To deepen understanding of multiplication.
- To understand the multiplication concerning 'times'
- To deepen understanding of division.
- To understand the division concerning 'times'.

Lesson Objectives

- To know about the term 'times' by making a tape.

Prior Knowledge

- Multiplication table (Grade 2)
- Measurement (cm, dL)

Preparation

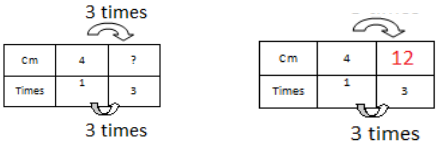
- Ruler and paper tape

Assessment

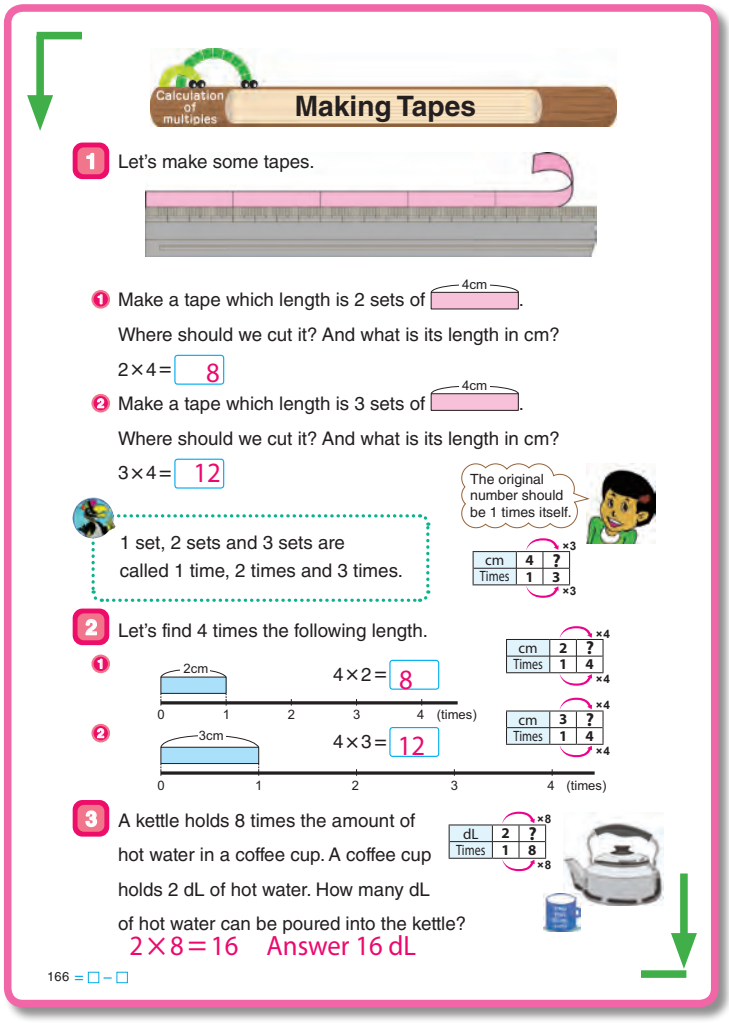
- Think about the meaning of how to calculate number of times correctly. F
- Calculate the number of times correctly S .

• Teacher's Notes •

The tape diagram and the tables are used in the activity to assist the students to see the relationship. The table shows the relationship between two quantities. It is important that the students understand the relationship and apply it. This kind of table will be used in other situations as the students advance.
If 1 unit is 4 cm, how long is 3 units?



Using the table the unit of quantity is in the first column. We base the calculation on 1 unit. When we know 1 unit is 4 cm and 3 units is 1×3 then the length for 3 units is simply 4×3.



Lesson Flow

1 ❶ Read the problem and find the length of 2 sets and 3 sets of a tape.

T Introduce the main task.
T ❶ How long will be 2 sets of 4 cm?
S 2×4=8 8 cm
T ❷ How about 3 sets of 4 cm?
S 3×4=12 12 cm
T Use the paper tapes for the explanation on the board.
T Explain the relationship by using the table (Refer to teacher's note.)

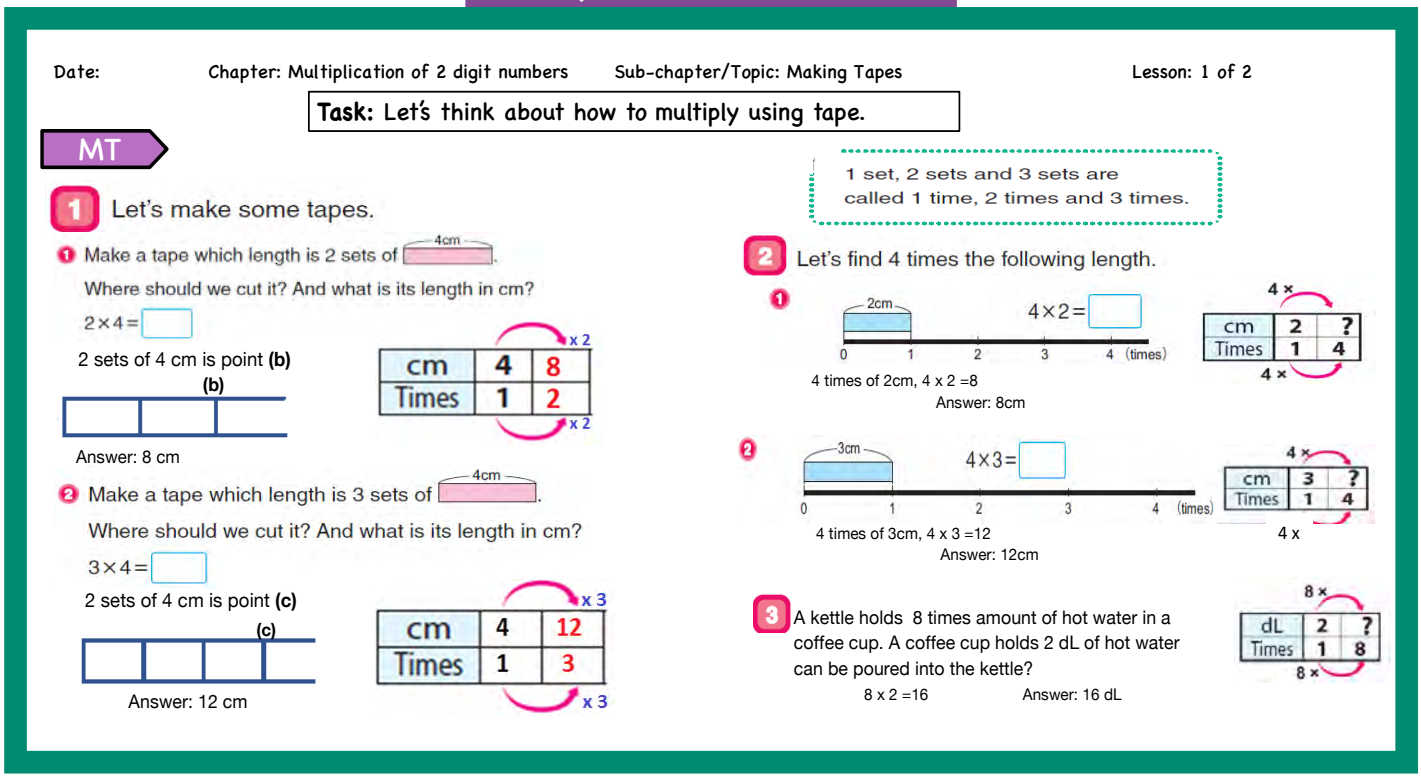
2 ❷ Read the problem, make mathematical expression and find the answer.

TN Use the table to explain.
T ❶ What is 4 multiplied by 2 cm?
S 2×4=8 8cm
T ❷ What is 4 multiplied by 3 cm?
S 3×4=12 12 cm
T Get the students to explain why the answers are different even when both are 4 times.
S Because the base number is different, activity ❶ is 2 cm and activity ❷ is 3 cm.

3 ❸ Read the problem and find the answer by drawing tape diagram and mathematical sentence.

T Let's draw a tape diagram to show the relation of 2 numbers.
T What is the mathematical expression to find the answer?
S 8×2
T Calculate the expression and find the answer.
S 8×2=16 16 dL

Sample Blackboard Plan



Unit 15

Unit: Multiplication of 2-digit Numbers
Sub-unit: Making Tapes
Lesson 2 of 2 (Single Period)

Textbook Page : p.167
Actual Lesson 114

Lesson Objectives

- To solve a situation problem of quotative division by using 'times'.
- To understand the relationship of 2 quantities.

Prior Knowledge

- Meaning of 'times'
- Multiplication table
- Measurement (cm)

Preparation

- Paper tape

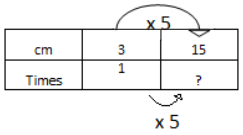
Assessment

- Think about how to solve the situation of quotative division by using times. F
- Solve the problems correctly. S

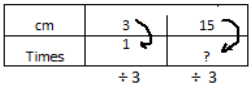
• Teacher's Notes •

The relationship of the table in this lesson is focusing on division based on times.

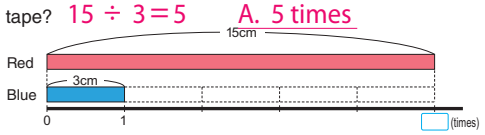
① In this example 3 cm is 1 unit therefore to know how many times 15 is, we can think of a number that we times with 3 to get 15. The same number we multiply with 1.



② In division we think of a number we divide with 3 to get 1. The same number we divide with 15 to get missing number



4 Kila has 15 cm of red tape and 3 cm of blue tape. How many times the length of the blue tape is equal to the length of the red tape? 15 ÷ 3 = 5 A. 5 times

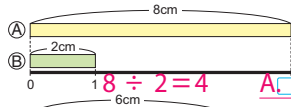


If 3 cm is regarded as 1 unit, 15 cm is 5 units of 3 cm.
This is called "15 cm is 5 times 3 cm".
To obtain the number of units 3 cm is equal to 15 cm, calculate 15 ÷ 3.

cm	3	15	÷3
Times	1	?	

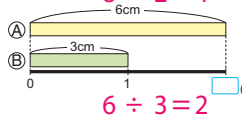
To make 3 to 1, what number should we divide 3 with.

5 How many times of tape Ⓑ is equal to tape Ⓐ ?



8 ÷ 2 = 4 A. 4 times

cm	2	8	÷2
Times	1	?	



6 ÷ 3 = 2 A. 2 times

cm	3	6	÷3
Times	1	?	

6 The big cooking oil container for Rose's aunty holds 24 L of cooking oil. The container for Angi's aunty holds 6 L of cooking oil. How many times the cooking oil for Angi's aunty's container can be held in Rose's aunty's container?

L	6	24	÷6
Times	1	?	

24 ÷ 6 = 4 A. 4 times

Lesson Flow

1 4 Think about the length of Red tape and how many times of the length of Blue.

T Introduce the main task.
T Observe the tape diagram. The length of red tape is how many times of the length of blue tape?
S 5 times
T Explain the relationship of 2 numbers by using the table.
TN Use the important points in the box to explain the relationship.

① ×5

cm	3	15
times	1	?

×5

②

cm	3	15
times	1	?
	÷3	÷3

T What is the mathematical expression to find the answer?
S 15÷3

2 5 Read the problem, make mathematical expression and find the answer.

T Which will be the base amount, A or B?
S B
T Make mathematical expressions and find the answer.
S ① 18÷2=4 4 times
② 6÷3=2 2 times
T Explain the relation of 2 numbers by using 4 cells table.

3 6 Read the problem, make mathematical expression and find the answer.

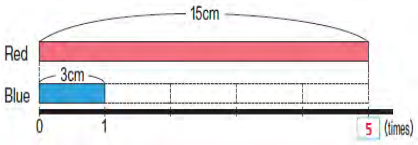
S Read the problem and write a mathematical expression.
T What is the base number?
S 6 L
T What is the mathematical sentence and answer?
S 24÷6=4 4 times
TN Let the students notice that even the length changes to volume, the way of thinking does not change.

Sample Blackboard Plan

Date: Chapter: Multiplication of 2 digit numbers Sub-chapter/Topic: Making Tapes Lesson: 2 of 2

MT

4 Kila has 15 cm of red tape and 3 cm of blue tape.
How many times the length of the blue tape

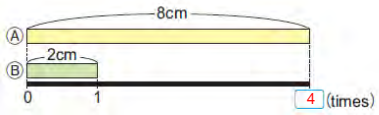


cm	3	15
Times	1	?

15 ÷ 3 = 5
Answer: 5 times

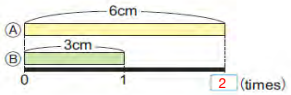
If 3 cm is regarded as 1 unit, 15 cm is 5 units of 3 cm.
This is called "15 cm is 5 times 3 cm.
To obtain the number of units 3 cm
is equal to 15 cm, calculate 15÷3.

5 How many times of tape B is equal to tape A?



cm	2	8
Times	1	?

8 ÷ 2 = 4 Answer: 4 times



cm	3	6
Times	1	?

6 ÷ 3 = 2 Answer: 2 times

6

L	6	24
Times	1	?

24 ÷ 6 = 4
Answer: 4 times

End of Chapter Test: Chapter 15 **Date:**

Multiplication of 2-digit Numbers	Name:	Score

1. Calculate in vertical form. (10 points × 6)

① 2 × 60 ② 16 × 24 ③ 21 × 14

④ 28 × 49 ⑤ 423 × 23 ⑥ 409 × 25

2. There are 39 children in class A. Each child used 12 papers for writing. How many papers did class A students use? (10 points × 2)

Mathematical sentence: _____ Answer: _____

3. There are 24 groups of 345 people. How many people are there in total? (10 points × 2)

Mathematical sentence: _____ Answer: _____

Chapter 16 Weight

1. Unit Objectives

- Explore how to compare weights through direct comparison, indirect comparison and arbitrary unit. (3.2.2a)
- To understand the meaning of unit weight. (3.2.2b)
- To measure the weight. (3.2.2b)
- To know the unit of gram, kilogram and tonne. (3.2.2b)
- To measure the weight appropriately by choosing their scale. (3.2.2c)
- To calculate weight using appropriate unit (3.2.2c)

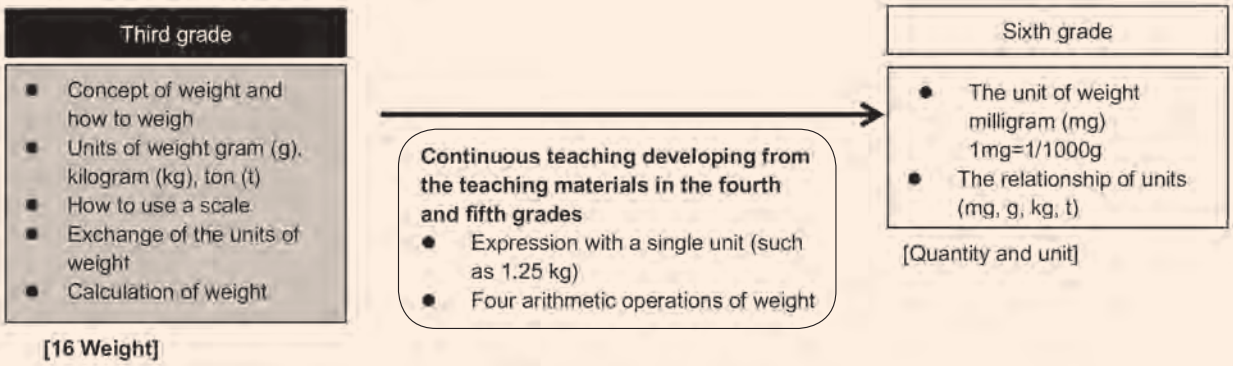
2. Teaching Overview

Students learnt length, volume and time already. Weight is slightly complicated for students since it is invisible, meaning that large things are not necessarily heavy, but in proportional relationship with volume such that bigger things are always heavy in case they are all made of the same material. Therefore, they firstly study the difference between weight and volume. The textbook intends that students will focus on relationship between weight and shapes, its size and materials. In the learning of quantities, the common ways of teaching/learning is; 1. Direct Comparison, 2. Indirect Comparison, 3. Measuring using certain (non-universal) units and 4. Universal units. Students should also feel and understand the conservation of mass despite of shapes and additional properties. They should learn these things through experiences without being imparted.

How to Represent Weight : Students measure 1 kg using several things such as 20 toea coins or any other things found in daily life. As they weigh several things of 1 kg repeatedly, they will gradually obtain the sense of 1 kg.

Calculation of Weight : Some students may have original misconception that addition of weight does not work out. The additional property of weight works out under the conservation of mass, meaning that weight does not change even if they change shapes or locations. Students are advised to understand it through experiences.

3. Related Learning Contents



Unit 16

Unit: Weight
Sub-unit: 1. How to Represent Weight
Lesson 1 of 7 (Double Period)

Textbook Page : p.168~p.169
Actual Lesson 115

Sub-unit Objectives

- To understand the concept of weight.
- To understand the unit of gram, kilogram and tonne.
- To measure the weight of things by using appropriate instruments.

Lesson Objectives

- To think about how to measure different things.
- To compare the weight of different things by using balance.

Prior Knowledge

- Measurements of lengths.

Preparation

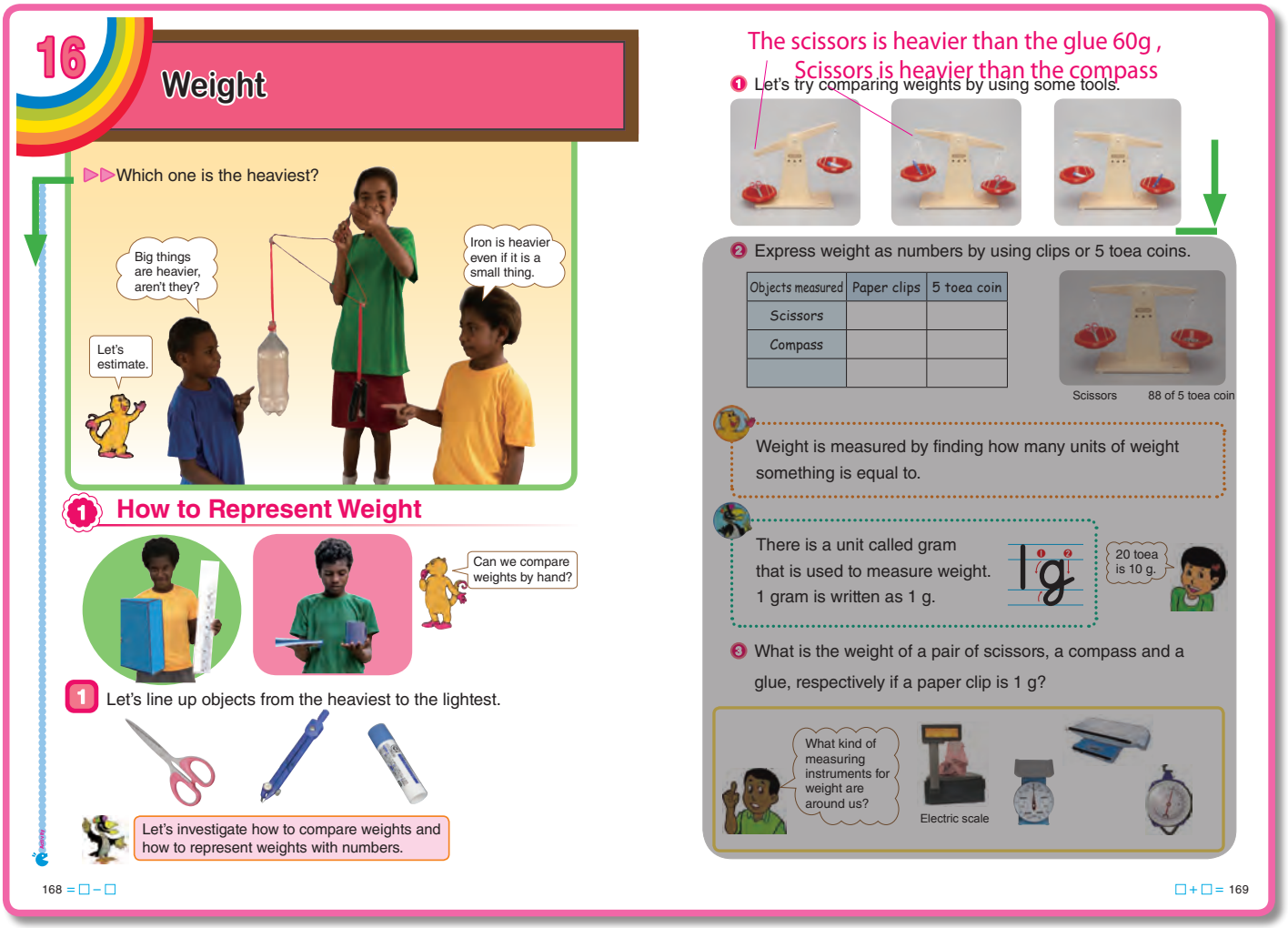
- Prepare balance
- Any available objects for comparison (eg. Scissors, glue stick, stones etc.)

Assessment

- Think about how to compare weights of different objects. F
- Understand that we can weigh objects using a Balance S

• Teacher's Notes •

Teacher may use either of the balance below or improvise for the lesson.
Hanger can be used as balance, simply tie two strings to each end of the hanger and let it hang on the door handle where students can come and tie their objects to the bands to compare.
Teacher can use the balance if available or use the pictures in the textbook.



Lesson Flow

1 Compare weight of various objects using a balance (Direct Comparison).

T Introduce the main task.
T Present various objects.
S Compare various objects using their hands and compare with other students.
T What can you say about the comparisons of objects?
S They are not exact/same weights.

2 1 Think about how to compare the weights of different things correctly with the balance.

T How can we compare exactly?
S We can use the balance to compare exactly.
TN Demonstrate how to use the balance.

3 Compare weight of materials using balance.

S Compare weight of scissors and glue stick, scissors and compass. Then compass with glue stick.
TN Use any available objects.
S Summarise which is heavier.
TN Ask students about what they have learned.
T How can we compare, if we cannot compare two things directly?

Sample Blackboard Plan

Date: Chapter Name: Weight Topic: How to represent weight Lesson Number: 1 of 7

Main Task: Let's think about how to compare weight of various objects.

MT

1 Let's compare the weight of different things using hands.
- Stones
- Eraser
- Pencil case
- Pencil
- Books
- Others

Students Ideas
Share their experience of comparing.

1 Let's compare using prepared balance
- Scissors and Compass
- Compass and Glue Stick
- Scissors and Glue Stick

Which is Heavier?	Heavier Object
Scissors or Compass	Compass
Compass or Glue Stick	Compass
Scissors or Glue Stick	Glue stick

Summary:
- Weight is how heavy an object is.
- We can compare weight by comparing using hands or by using balance.

Unit 16

Unit: Weight
Sub-unit: 1. How to Represent Weight
Lesson 2 of 7 (Double Period)

Textbook Page : p.169
Actual Lesson 116

Lesson Objectives

- To know that there is a standard unit for weight.
- To understand how to write and read the unit (1g) gram.

Prior Knowledge

- Measuring lengths
- Using a Balance to compare weight.

Preparation

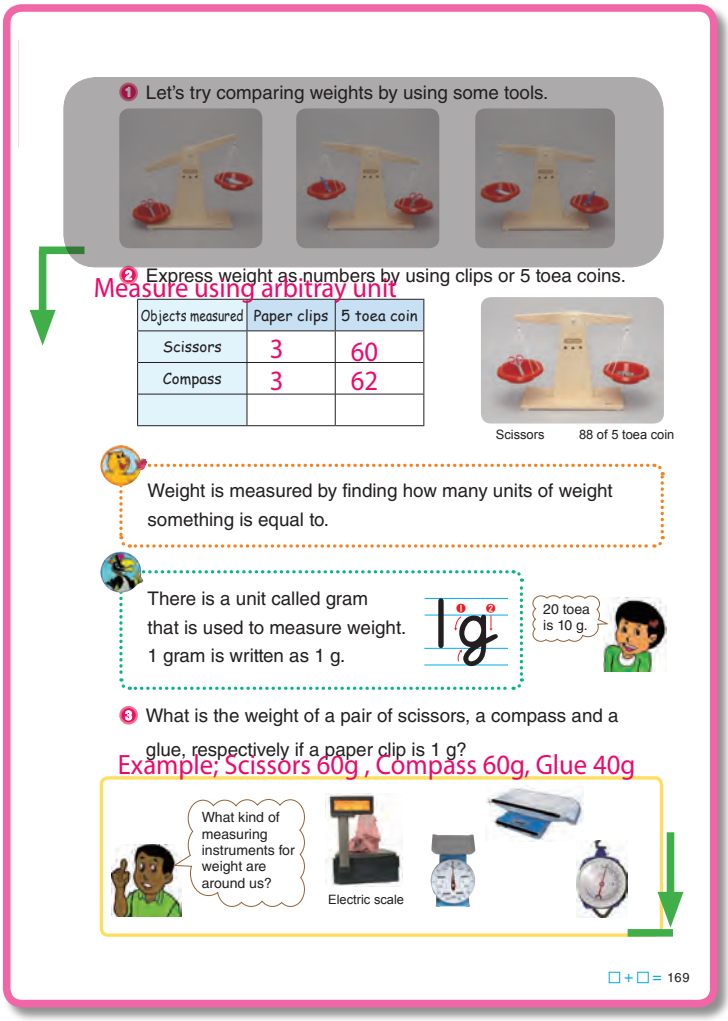
- Balance
- Scissors, glue stick and compass.
- Paper clips
- 5 toea coins

Assessment

- Compare weights of different objects with paper clips. F
- Understand that we can read and write weights using same unit (gram). S

• Teacher's Notes •

The metal paper clips or 5 toea coins that weigh have the weight close to 1 gram and can be used in this lesson.
The number of paper clips that balance the scissors, compass or glue stick gives the weight of the object respectively.



Lesson Flow

1 ❷ Let's think about how to show the weight of things.

T Introduce the main task.
T If we cannot compare two things directly, how can we compare?
S We need the same unit to show weight.
T What kind of unit can we use?"
T Direct students attention to the use of paper clips or 5 toea coins to measure weights of scissors, compass and glue stick.
TN Any object of the same weight can be used as on arbitrary unit.
Example: paper clips only.
S We need the same thing so we need paper clips or 5 toea coins to show each weight.
T Demonstrates how to use paper clips or 5 toea coins to measure the weight of a pair of scissors, compass and glue stick.
S Investigate the weight of materials using paper clips or 5 toea coins. Write the number of paper clips or 5 toea coins into the table.
S Understand that when using an object like paper clip weight of each object can be measured.
T Explain the important point in the box .

2 Know about the unit of gram.

T Explain the important point in the box .

3 ❸ Show the weight of scissors, compass and glue using grams.

S Change the 'paper clip' as a unit to 'gram'.
TN Assume that paper clip is 1 g.

Sample Blackboard Plan

Date:

Topic: How to represent weight

Lesson Number: 2 of 7

Main Task: To think about how to represent weight of objects.

MT

Review

Which is Heavier?	Heavier Object
Scissors or Compass	Compass
Compass or Glue Stick	Compass
Scissors or Glue Stick	Glue stick

❷ Let's think about how to show weight of things.

Students Ideas
Illustrate the answer

Objects measured	paper clips or 5 toeas
Scissors	
Compass	
Glue	
Stapler	

Important Point

There is a universal unit called gram that is used to measure weight.
1 gram is written as 1 g.

❸ If the paper clip is 1 g. What will be the weight in grams?

Objects measured	paper clip	In gram
Scissors	60	60
Compass	62	62
Glue	45	45
Stapler	220	220

Summary:

There is a unit called gram that is used to measure weight.
1 gram is written as 1 g.

Unit 16

Unit: Weight
Sub-unit: 1. How to Represent Weight
Lesson 3 of 7 (Single Period)

Textbook Page : p.170
Actual Lesson 117

Lesson Objectives

- To know that there is a standard measuring tool for measuring weight.
- To measure various things using a measuring tool.

Prior Knowledge

- Using Balance to compare weight.
- Measuring weight scale (1 g). (Previous lesson)

Preparation

- Scale (If available)

Assessment

- Compare weights of different objects using the scale. F
- Understand how to read the scales in gram. S

• Teacher's Notes •

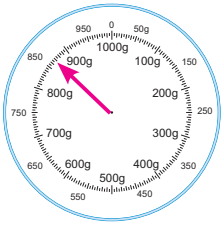
The scale can be borrowed from the clinic. Teacher can use the textbook image if the scale is not available.

2 How to read the scale

A scale is used to measure weight.

Measure the weight of the following objects by using the scale.

1. Up to how many grams can we measure on the above scale? 1000 g
2. How many grams does the smallest unit express? 5 g
3. How many grams is the weight of the pencil case? And how many grams is the weight of the book? 270 g
4. The weight of the plate of avocados is 875 g.
   Draw a needle on the scale shown on the right of this weight.



170 = □ − □

Lesson Flow

1 Review previous lesson.

T Introduce the main task.

2 ❷ Observe a measuring tool.

T Show students a measuring tool and ask, “What is this?”
S It is something used to measure objects.
T Use different objects to measure weights. Allow for investigation.
T Asks following questions as guide;
❶ “Up to how many g can we measure on the above scale?”
❷ “How many g does the smallest unit express?”
❸ “How many g is the weight of a pencil case? And how many g is the weight of a book?”
S Investigate by placing objects on the measuring tool and give the readings.
S Present their answers to activity ❶ - ❸

3 ❹ Find the weight of avocado.

T Demonstrate weight of avocado’s case and show weight on the board by drawing the needle on the scale as shown in the textbook.
S Draw an arrow to show the weight of avocado.

Sample Blackboard Plan

Date: Topic: How to represent weight Lesson Number: 3 of 7

Main Task: Let’s think about how to read the scale.

Review
What tool did we use to compare weight?

Students Ideas

Answer: Balance
What other measuring tools can we use?

Students Ideas

Answer: Scale.

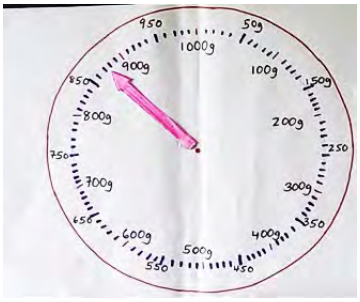
MT

2 Let’s use a scale to measure weight of objects.

Work on ❶ - ❹

Students Ideas
Explain their answers for ❶ - ❹

Answers
❶ 1000g
❷ 5g
❸ 270



❹ The weight of the plate of avocados is 875g.

Summary:
We read the scale the same way as we read the clock.
The small scales add up to give the bigger scales.

Unit 16

Unit: Weight
Sub-unit: 1. How to Represent Weight
Lesson 4 of 7 (Double Period)

Textbook Page : p.171
Actual Lesson 118

Lesson Objectives

- To know the unit of kilogram and tonne as a unit of measurement.
- To measure the weight using kilogram.

Prior Knowledge

- Measurements unit (1 g)

Preparation

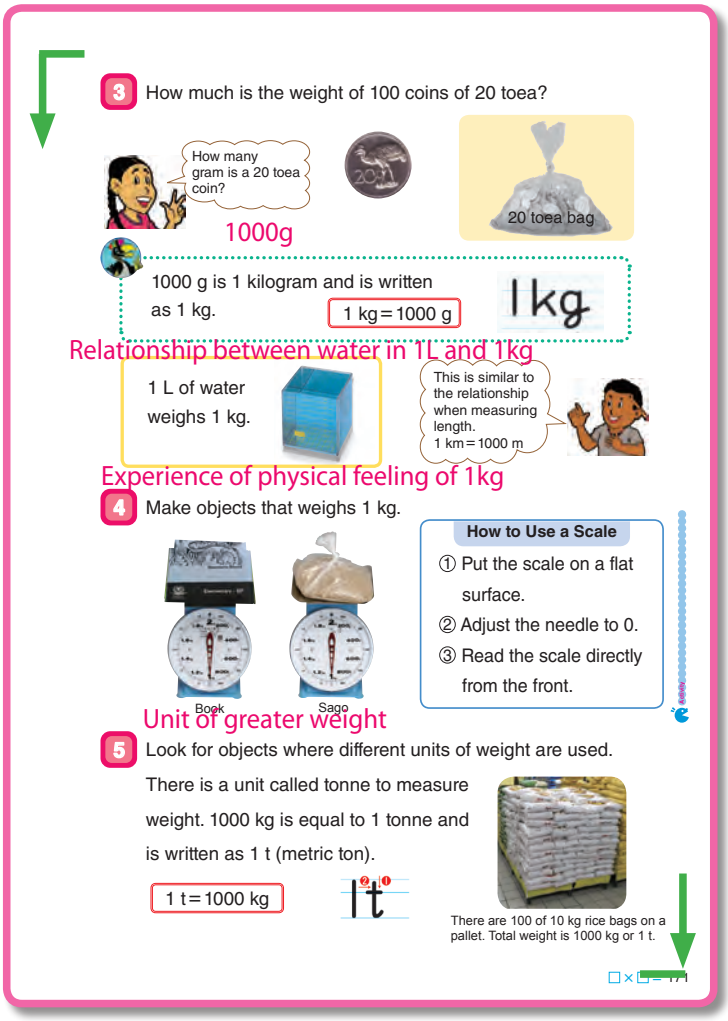
- Scale
- Objects weighing 1 kg or more than 1 kg.
- 1 L of water
- Picture of an object that weighs 1 t, eg; car, ship or 100 bags of 10 kg rice on pallet.

Assessment

- Compare weights of different objects around their classroom that weighs more than 1 kg and weigh them. F
- Understand the unit of kilogram (1 kg) and tonne (1 t). S

• Teacher's Notes •

Teacher should provide items of 1 kg for the task 4.
Example: 1 L Coke, 2 bottles of 500 mL, 1 kg rice or sugar, ets.



Lesson Flow

1 3 Identify the unit of kilogram.

T Introduce the main task.
T The weight of the 20 toea coin is 10 g. How much is the weight of 100 coins of 20 toea?
S 1000 g. Because 10 × 100 = 1000.
T Explain the important point in the box .

2 4 Think about how to measure 1 kg objects using the scale.

T Confirm how to use the scale with class.
S Measure materials around the classroom and find 1 kg materials.
S Hold the 1 kg material by hand and feel the weight of the objects.

3 5 Identify the unit of tonne.

T Show students example or pictures of a ship, a car or 100 rice bags weighing 10 kg to understand that 1000 kg = 1 tonne.
S Name other objects around their surroundings that weigh more than 1 tonne.
Example: PMV bus, Truck, Big rock, Tree, 4 bags of 250 kg coffee and a pallet of 20 kg rice bags etc.

Sample Blackboard Plan

Date:

Topic: How to represent weight

Lesson Number: 4 of 7

Main Task: Let's think about units greater than gram.

MT

The weight of a 20 toea coin is 10 grams.

3 How much is the weight of 100 coins of 20 toea?

100 (coins) x 10 (g) = 1000
Answer: 1 000 grams.

1000 g is called 1 kilogram.
written as 1 kg 1kg = 1000 g

4 Make objects that weights 1 Kg.
How to use the scale.
1. Put the scale on a flat surface.
2. Adjust the needle to 0.
3. Read the scale from the front directly.

1kg rice, 1 kg sugar, 1L Coke,
2 bottles of 500ml and so on.

5 There is a unit called tonne to measure weight.
1000 kg is equal to 1 tonne and is written as 1 t (metric ton)

1t = 1000 kg

There are 100 of 10kg rice bags on a pallet. Total weight is 1000kg or 1t.

Unit 16

Unit: Weight
Sub-unit: 1. How to Represent Weight
Lesson 5 of 7 (Double Period)

Textbook Page : p.172
Actual Lesson 119

Lesson Objectives

- To understand the structure of a kg scale and read the scale accurately.

Preparation

- Scale (If possible)

Prior Knowledge

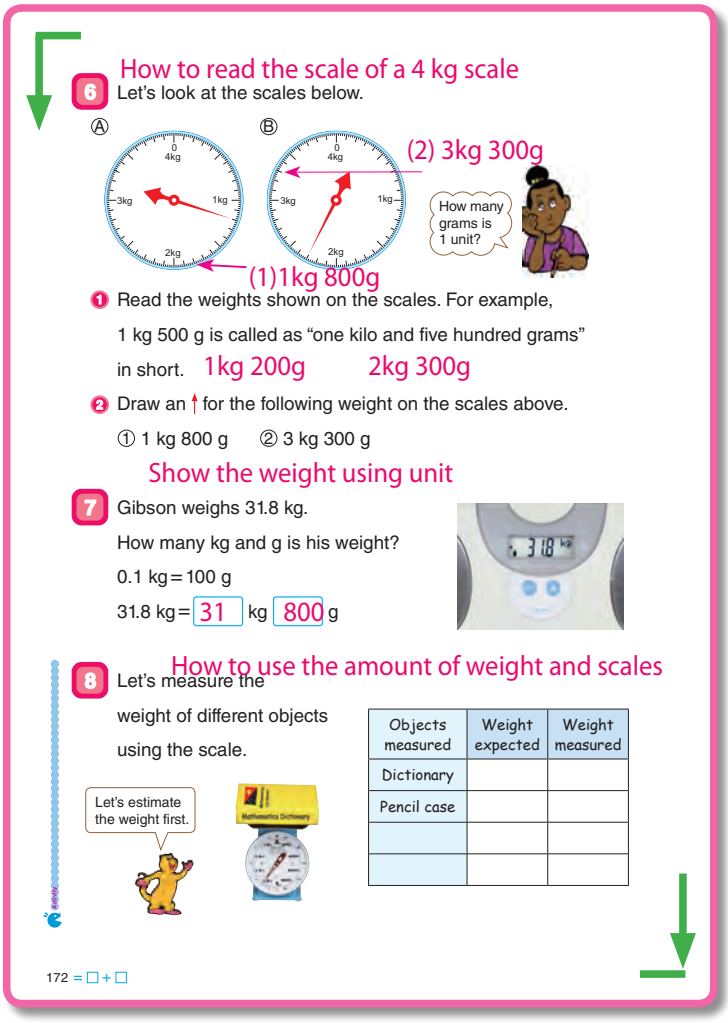
- Measurement units 1 g, 1 kg and 1 t

Assessment

- Measure various things using scale. F
- Read scale unit of kilogram and gram correctly. S

• Teacher's Notes •

When reading the scale;
Firstly find out the unit scale by dividing the gram by scale division. For example, 100 g divide by 5 scale division is 20 g. Therefore, 1 unit scale is 20 g.
Then notice where the needle stops, read the scale.



How to read the scale of a 4 kg scale

6 Let's look at the scales below.

Ⓐ Ⓑ

(2) 3kg 300g

How many grams is 1 unit?

(1)1kg 800g

1 Read the weights shown on the scales. For example, 1 kg 500 g is called as "one kilo and five hundred grams" in short. 1kg 200g 2kg 300g

2 Draw an ↑ for the following weight on the scales above.
① 1 kg 800 g ② 3 kg 300 g

Show the weight using unit

7 Gibson weighs 31.8 kg.
How many kg and g is his weight?
0.1 kg = 100 g
31.8 kg = 31 kg 800 g

How to use the amount of weight and scales

8 Let's measure the weight of different objects using the scale.

Let's estimate the weight first.

Objects measured	Weight expected	Weight measured
Dictionary		
Pencil case		

172 = □ + □

Lesson Flow

1 6 Read the scale in the textbook.

T Introduce the main task.
T Ask students to read the intervals on the scale. “How many unit of interval is represented by the scale?”
S 20 g and 100 g
TN Assist students on how to find a unit scale (Refer to TN)
S Solve activity 1 and 2.

2 7 Read the scale 31.8 kg.

S Convert the scale to kilogram and gram.
T Confirm that 1 kg = 1000 g, so 0.1 kg = 100 g
S Share answers with friends.

3 8 Measure the weight of various objects using scale.

T Allow students to predict the weight before measuring.
TN Predicting the weight improves students’ knowledge and sense of weight.
S Measure the weight and write the result in the table.
S Share the result.
TN If the scale is available then this task can be conducted.

Sample Blackboard Plan

Date:

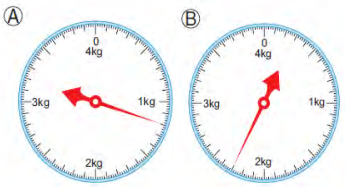
Topic: How to represent weight

Lesson Number: 5 of 7

Main Task : Let’s read and measure weight using a scale.

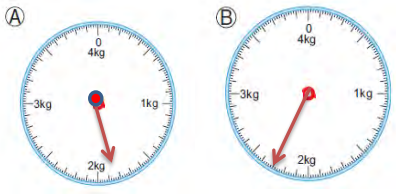
MT

6 Let’s look at the scale below.



1 Read the weights shown on the scale.
A. One kilo and two hundred grams.
B. Two kilo and three hundred grams.

2 Draw an arrow for the following weight on the scales above. 1kg 800 g and 2 kg 300 g



1kg 800 g

2kg 300 g

7 Gibson weighs 31.8 kg How many kg and g is his weight?
0.1 kg = 100 g

31.8 kg = 31 kg 800 g

Answer: 31 kilo and 800 grams.

8 Let’s measure weight of different objects using the scale.

Objects	Estimated Weight.	Weight measured
Dictionary		
Purse		
Pencil case		

Students Ideas
Fill in the Table
Predict first then measure

Summary:
When reading the scale:
Firstly find the unit scale
Then read the scale by intervals.

Unit 16

Unit: Weight
Sub-unit: 1. How to Represent Weight
Lesson 6 of 7 (Double Period)

Textbook Page : p.173
Actual Lesson 120

Lesson Objectives

- To predict the weight of objects.
- To choose scale when measuring in terms of lengths, weight and volume. Finding the common relationship compared to other unit of measurements.

Prior Knowledge

- Measurements unit 1 g, 1 kg and 1 t

Preparation

- Scale (If possible)

Assessment

- Differentiate unit of measurements to measure depending on the predicted weight. F
- Think about the relationship in lengths, weight and volume. F
- Understand the relationship in lengths, weight and volume. S

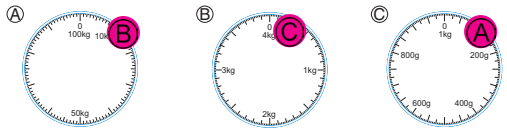
• Teacher's Notes •

There are various types of scales used to measure different weights. For example;
A. Small digital scale measures up to 200 g
B. Kitchen scales measures up to 1 kg.
C. Bathroom scale measures up to 100 kg.

Select appropriate scale

9 Identify the appropriate scale for the following items.

1 Watermelon　2 Textbook　3 Your weight



Find the rule of the unit

Units of Quantities

10 We have learned the units of length, amount of water and weight. There are units of quantities as follows.

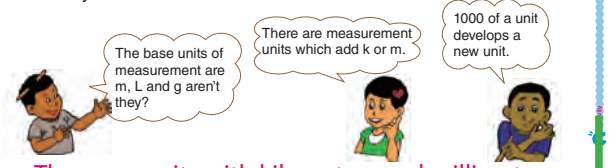
Length	mm, cm, m, km
Weight	g, kg, t
Amount of water	mL, dL, L

1 Fill in the ☐ with a number.

1 m = 1000 mm　　1 L = 1000 mL

1 km = 1000 m　　1 kg = 1000 g

2 Let's discuss what you found. Then write down your answer in your exercise books.



There are units with kilometres and millimetres k and m which have 1000 relationships

Lesson Flow

1 9 Predict the weight of items and choose the scale to measure.

T Introduce main task.
S Choose the appropriate scale to measure the items in the textbook.
T About how many kilograms is the watermelon, a textbook and your weight?
T Which unit of scale can be used for each item?
S Choose appropriate scale for each item.
TN Weights measured differ depending on the type of scale used (Refer to TN)

2 10 Confirm the relationship of weight with other units.

S 1 Solve the activity.
S 2 Notice and discuss the relationship of the units.
T How many metres are there in 1 kilometre?
S 1000 m.
T How many kilograms are there in 1 tonne?
S 1000 kg
T How many millilitres are there in 1 litre?
S 1000 ml
T What do you notice about the units?
S The relationship between the unit is:
- The base units of measurement are m, L, and g
- There are measurement units which add k or m
- 1000 of a unit develops a new unit.

Sample Blackboard Plan

Date: Topic: How to represent weight Lesson Number: 6 of 7

Main Task: Let's identify the correct scale.

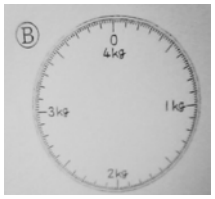
MT

Review:
1. What unit of scale is used to measure a pen? Answer: Gram
2. What unit of scale is used to measure a vehicle? Answer: tonne

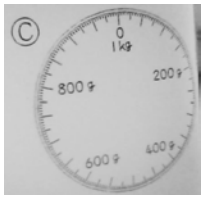
9 Match the items to the scale.

Students Ideas
Discuss their answer

Your weight



Watermelon



Textbook

10 Let's study the units of quantities.

Length:	mm	cm	m	km
Weight:	g	kg	t	
Amount of water:	mm	dl	L	

1 1 km = 1000m 1 kg = 1000g
1 m = 1000mm 1 L = 1000ml

2 Students Ideas
Discuss their answer

- K (Kilo) , m (metre) are new units develop from 1000.
- m, L and g are the base unit.

Summary:

The weights measured differ depending on types of scale.

Unit 16

Unit: Weight
Sub-unit: 1. How to Represent Weight
Lesson 7 of 7 (Double Period)

Textbook Page : p.174
Actual Lesson 121

Lesson Objectives

- To understand that an object may have the same volume but different weight.
- To understand that the weight remains the same even when the shape of the object changes.

Prior Knowledge

- Relationship in Measurements (Previous lesson)

Preparation

- Weighing scales (If available)
- Block of timber, rubber, iron or aluminum with same size. (Two of these materials can do for the investigation purpose).

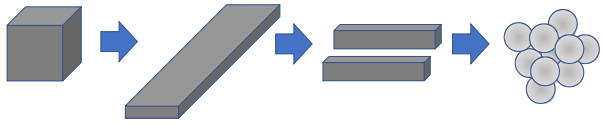
Assessment

- Compare the weight of different material of blocks. F
- Compare the weight changing its shape. F
- Conclude the findings. S

• Teacher's Notes •

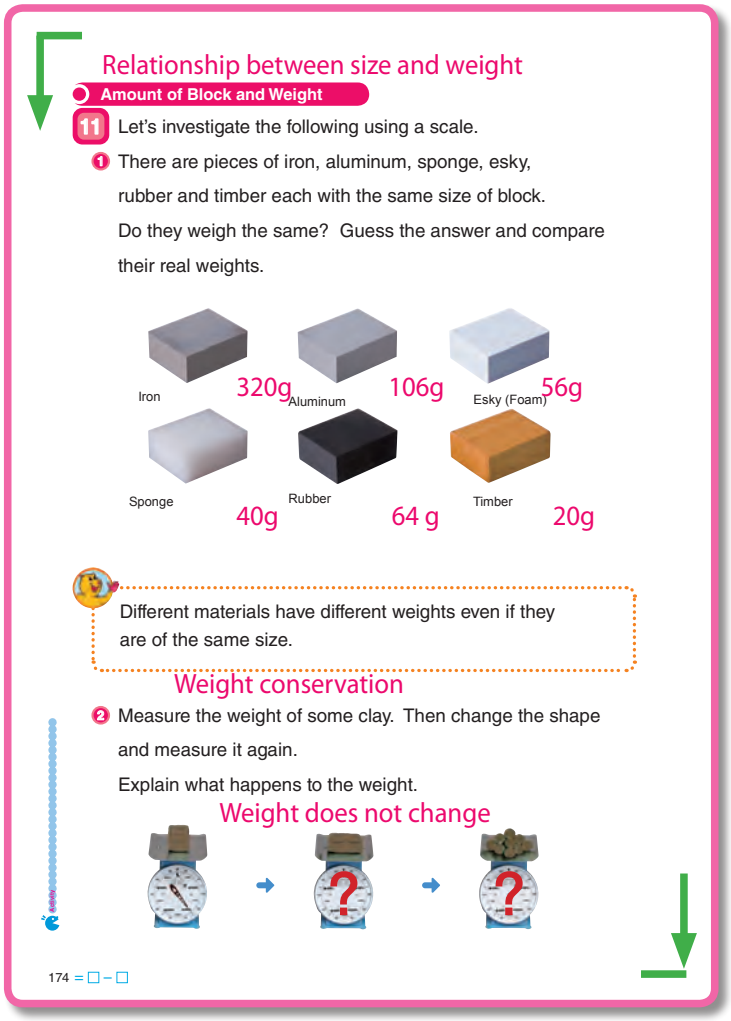
For activity 2 Use the same amount of clay and measure to get the weight.
Change the shape of the clay and weigh. The first shape as flat square shape, the second shape as 2 long solid stripes and the third shape as small round shapes.

Example



400g 400g 400g 400g

Weigh the shapes and let students to observe to discover for themselves the weights they have.
The important point is the shape changes however the **weight does not change**.



Relationship between size and weight

Amount of Block and Weight

11 Let's investigate the following using a scale.

1 There are pieces of iron, aluminum, sponge, esky, rubber and timber each with the same size of block.
Do they weigh the same? Guess the answer and compare their real weights.

Iron 320g
Aluminum 106g
Esky (Foam) 56g
Sponge 40g
Rubber 64 g
Timber 20g

Different materials have different weights even if they are of the same size.

Weight conservation

2 Measure the weight of some clay. Then change the shape and measure it again.
Explain what happens to the weight.

Weight does not change

174 = □ – □

Lesson Flow

1 11 ❶ Investigate the weight of materials with different weight and same volume.

T Introduce the main task.
T Ask the students to observe the pictures of the different materials and discuss the question “Do they have the same weight?”
S Discuss and share their opinion.
T Give weight of the objects to the students to see if they are correct with their answers.
S Understand that weight is different depending on the material even though the volume is the same.
T Explain the summary box.

2 ❷ Compare the weight of clay when changing the shapes.

TN (Refer to TN)
S Predict the weight when shapes are change before weighing it.
S Share their opinions and reasons.
T Weigh the clay after changing its shape.
S Conclude that even when shapes are changed, the weight remains the same.

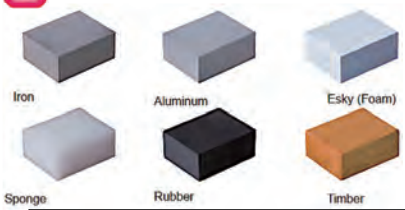
Sample Blackboard Plan

Date: Topic: How to represent weight Lesson Number: 7 of 7

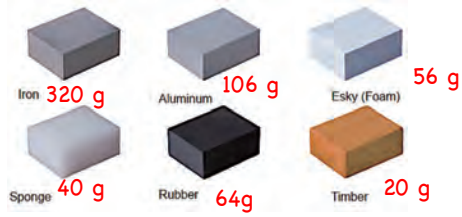
Main Task: Let’s find out the relationship between size and weight.

MT

11 ❶ Do they have the same weight?



Students Ideas. Discuss their answer for ❶



Important Point

❷ Measure the weight of some clay and change the shape and measure it again. What happens to the weight?

Shape of the clay.	Estimated Weight	Weight Weighed.
1. Flat square shape.	420g / 430g	400g
2. 2 rectangle stripe solid shape.	410g / 415g	400g
3. Small round shape.	380g / 390g	400g

Summary:

When the shape of an object changes the weight remains the same.

We may sit, stand or bend knees on scale but our weight will remain the same.

Unit 16

Unit: Weight
Sub-unit: 2. Calculation of Weight
Lesson 1 of 1 (Double Period)

Textbook Page : p.175
Actual Lesson 122

Sub-unit Objectives

- To add and subtract weight considering the situation.

Lesson Objectives

- To add and subtract weight according to the situation.

Prior Knowledge

- Relationship in Measurements.

Preparation

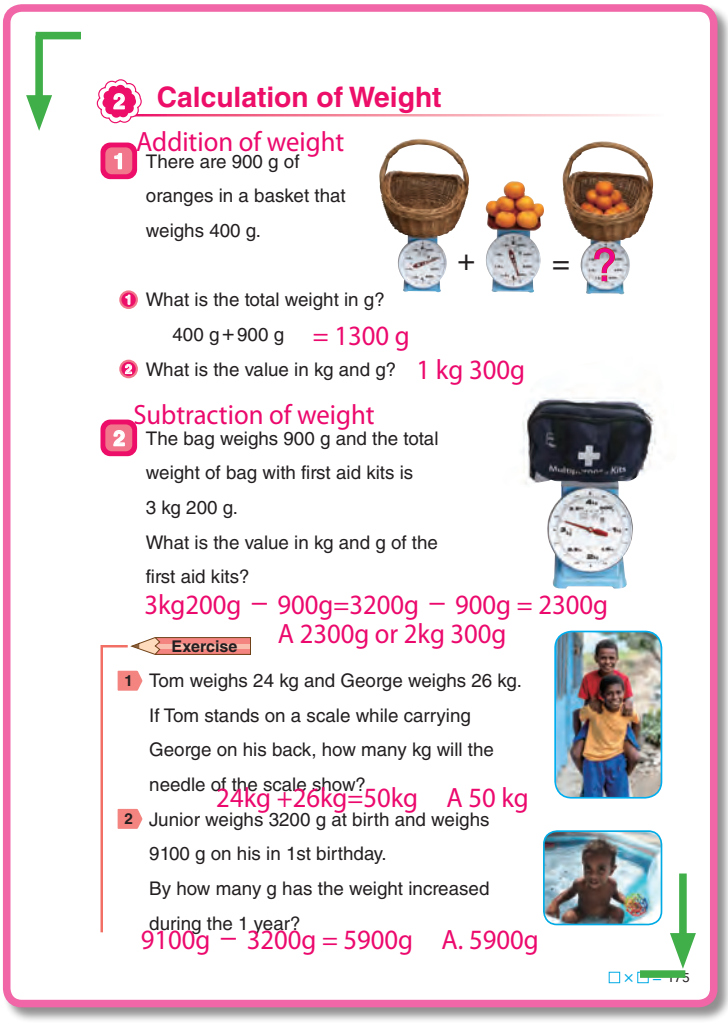
- Refer to the blackboard plan.

Assessment

- Add and subtract weights. F
- Do the exercise Correctly. S

• Teacher's Notes •

The focus of this lesson is for the students to understand that weight can be added or subtracted depending on different situations. When there are two items put together their weight can be added, when one item is removed from another their weight can be subtracted.



2 Calculation of Weight

1 Addition of weight

There are 900 g of oranges in a basket that weighs 400 g.

1 What is the total weight in g?

400 g + 900 g = 1300 g

2 What is the value in kg and g? 1 kg 300g

2 Subtraction of weight

The bag weighs 900 g and the total weight of bag with first aid kits is 3 kg 200 g.

What is the value in kg and g of the first aid kits?

3kg200g − 900g=3200g − 900g = 2300g

A 2300g or 2kg 300g

Exercise

1 Tom weighs 24 kg and George weighs 26 kg. If Tom stands on a scale while carrying George on his back, how many kg will the needle of the scale show?

24kg +26kg=50kg A 50 kg

2 Junior weighs 3200 g at birth and weighs 9100 g on his in 1st birthday. By how many g has the weight increased during the 1 year?

9100g − 3200g = 5900g A. 5900g

Lesson Flow

1 ① Solve the task.

T Introduce the main task.
S ① Make mathematical expression and solve it.
S ② Convert the gram to kilogram.
TN Confirm that 1 kg = 1000 g

2 ② Solve the task.

T Confirm that 'Total weight − Weight of bag = Weight of the content'.
S Make mathematical expression and solve it.
T Adjust the unit for the calculation.

3 Do the exercise.

Sample Blackboard Plan

Date: Topic: Calculation of weight Lesson Number: 1 of 1

Main Task: Let's Calculate Weight.

MT

1 There are 900 g of oranges in a basket that weighs 400 g.

① Total weight

400 + 900 = 1 300

weights bag oranges

Answer: The total weight of the basket and the oranges is 1 300 g.

② What is the value in kg and g?
Answer: 1kg 300 g

2 The bag weighs 900g and the total weight of bag with first aid kit is 3kg 200g. What is the value in kg and g of the bag and the first aid kit?

3 kg 200 g − 900 g

$$\begin{array}{r} 3\ 200 \\ -\ \ 900 \\ \hline 2\ \ 300 \end{array}$$

2 kg 300 g

Answer: The value of the first aid kit is 2 kg 300 g

Summary:

We can add weight and subtract weight.

Exercise:

1. Tom + George = Total weight.
   26 + 24 = 50

Total weight: 50 kg

2. 9 100 − 3 200 = 5 900

Increased weight: 5 900 g

Unit 16

Unit: Weight
Sub-unit: Exercise and Evaluation
Lesson 1 of 1 (Double Period)

Textbook Page : p.176
Actual Lesson 123

Lesson Objectives

- To deepen the understanding of things learned already.

Prior Knowledge

- All the contents in this unit.

Preparation

- Evaluation sheet for the students

Assessment

- Solve the exercises correctly. F S.

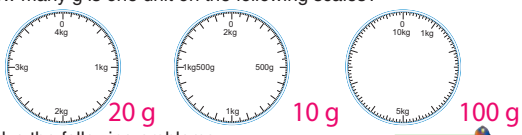
Exercise

1 Solve the following problems. Pages 173,175

① When we add 1 kg of sand and 2 kg of sand, how many kg are there altogether? And how many g are there?
3 kg or 3000 grams

② When we add 2 L of water and 3 L of water, how many L are there altogether? And how many kg are there? 5 L and 5 kg

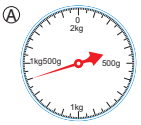
2 How many g is one unit on the following scales? Page 173



20 g　10 g　100 g

3 Solve the following problems. Page 172

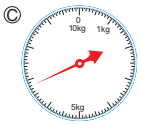
① How many g and kg does each of the following scales Ⓐ ~ Ⓒ show? How many kg are there?

Ⓐ 

1 kg 400 g
1400 g

Ⓑ 

2 kg 700 g
2700 g

Ⓒ 

6 kg 800 g
6800 g

② On the number line, mark ↓ where Ⓐ, Ⓑ and Ⓒ are.

Let's calculate. Grade 3 Do you remember?

① 84×65 5460　② 56×90 5040　③ 457×42 19194　④ 209×70 14630

176 = □ + □

Weight	Name:	Score

1. Fill in the blanks. (5 points × 6)

① 1 kg = 1000 g　② 1 t = 1000 kg　③ 3000 g = 3 kg
④ 5000 kg = 5 t　⑤ 3 t = 3000 kg　⑥ 10 kg = 100000 g

2. Read the scale. (5 points × 2)

540 g

410 g

3. Fill in the missing units (5 points × 2)

① Vavi's weight : 28 kg
② Weight of a heavy truck : 10 t

4. Calculate. (5 points × 6)

① 500 g + 400 g = 900 g　② 1kg800g + 200 g = 2 kg　③ 1kg 800g - 300g = 2 kg 100 g
④ 700 g - 200 g = 500 g　⑤ 1kg - 600g = 400 g　⑥ 1kg200g - 500g = 700 g

5. A 200 g pencil case was placed into a bag and the weight was measured at 1kg 500g. What is the weight of the bag alone? (10 points × 2)

Mathematical sentence: 1 kg 500 g − 200 g = 1 kg 300 g　Answer: 1 kg 300 g

Lesson Flow

1 ① Confirm the relationship among unit.

S ① Confirm that 1 kg is equal to 1000 g.
S ② 1 L of water is equal to 1 kg.

2 ② Confirm one unit of each scale.

S Think of one unit of each scale considering certain units is divided by how many unit.

3 ③ Confirm how to read a scale.

TN Let students notice that each scale has a different unit.
S Confirm that 1000 g is equal to 1 kg.

End of Chapter Test: Chapter 16 **Date:**

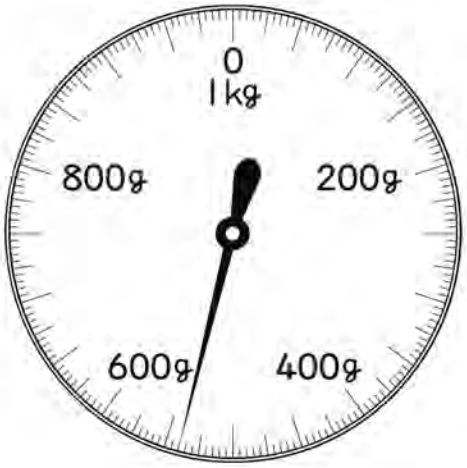
Weight	Name:	Score

1. Fill in the blanks. (5 points × 6)

① 1 kg = _____ g ② 1 t = _____ kg ③ 3000 g = _____ kg

④ 5000 kg = _____ t ⑤ 3 t = _____ kg ⑥ 10 kg = _____ g

2. Read the scale. (5 points ×2)



_____ g

_____ g

3. Fill in the missing units (5 points × 2)

① Vavi's weight : 28 _____

② Weight of a heavy truck : 10 _____

4. Calculate. (5 points × 6)

① 500 g + 400 g ② 1kg800g + 200 g ③ 1kg 800g + 300g

④ 700 g - 200 g ⑤ 1kg − 600g ⑥ 1kg200g - 500g

5. A 200 g pencil case was placed into a bag and the weight was measured at 1kg 500g. What is the weight of the bag alone? (10 points × 2)

Mathematical sentence: _____ Answer: _____

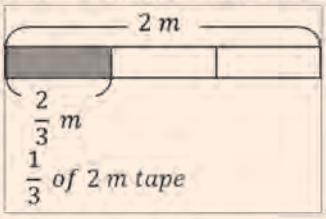
Chapter 17 Fractions

1. Unit Objectives

- To understand, explain and represent the meaning of fractions using the idea of unit fraction. (3.1.7a)
- Use fraction to show remaining part or one part of a whole. (3.1.7b)
- To know that fraction consists of sum of unit fraction and explain the structure of fraction in size and relationship. (3.1.7b)
- To calculate addition and subtraction of fractions. (3.1.8 a, b, c and d)
- To represent 0.1 or 1/10 on the number line. (3.1.7c)

2. Teaching Overview

There may be some confusions of teaching and learning fractions for both teachers and students. One of the common confusions is the confusion between fractions as quantities and ratio to whole part (see the diagram). Therefore, it is advisable for students to discuss a lot about the meaning of fractions with diagrams such as number lines, diagrams of liquid in containers, or tape diagrams so that they will help students to understand addition or size of fractions and the meanings.

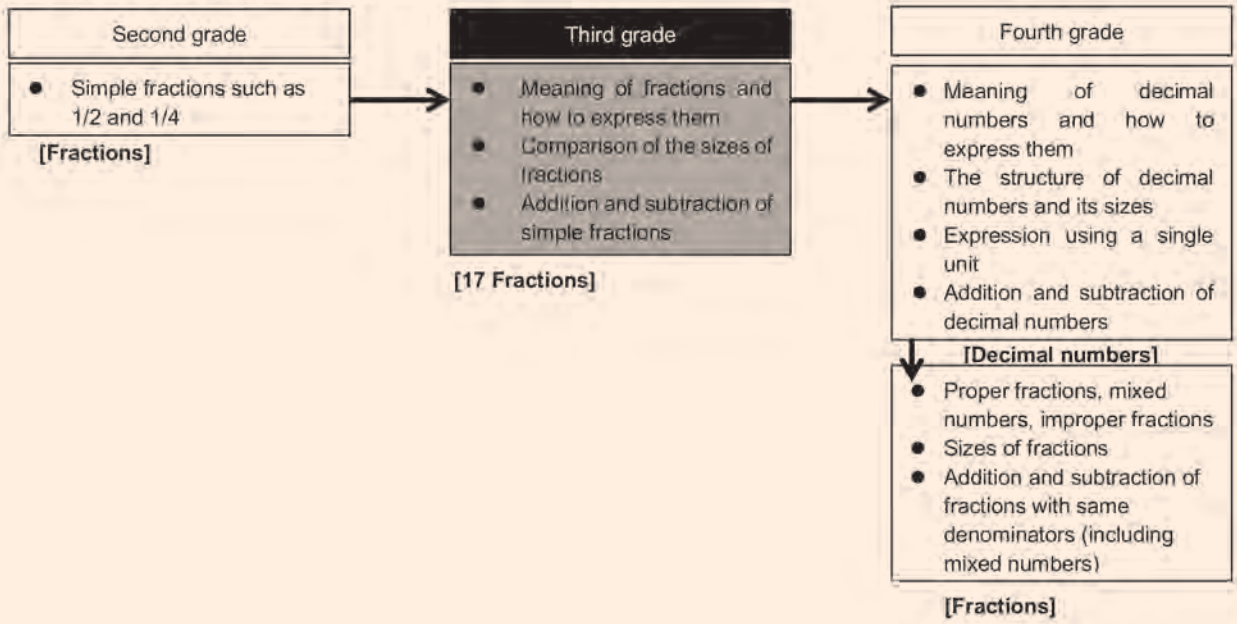


Fractions : Fractions are introduced as "odd sum" for students to start thinking about the necessity of expressing and comparing the amounts. Fractions are made of a number of unit fractions such that $\frac{3}{4}$ are made up with 3 of $\frac{1}{4}$. Note that they should understand that a unit fraction is a part of whole divided into equal portions. This is why 4 of $\frac{1}{4}$ do not make 1.

The Structure of Fractions : Students should understand sizes of fractions in relation to number lines. This will be the foundation of understanding the relationship among whole numbers, fractions and decimals.

Addition and Subtraction of Fractions : Note that teachers should avoid imparting how to calculate only, but students should understand why they add or subtract numerators only with the same denominators. Students should be encouraged to explain by themselves by drawing diagrams and explain verbally.

3. Related Learning Contents



Unit 17

Unit: Fractions
Sub-unit: 1. Fractions
Lesson 1 of 3 (Double Period)

Textbook Page : p.177~p.178
Actual Lesson 124

Sub-unit Objectives

- To think about how to express the remaining part and show it using the unit fraction idea.
- To understand the remaining part can be expressed using unit fraction.
- To understand the terms numerator and the denominator in fraction.

Lesson Objectives

- To identify how to represent the given quantities in fractions.
- To represent the size of objects less than 1 and the remaining part.
- To show representation of meaning of unit fraction.

Prior Knowledge

- Learned representing parts of whole fractions in the fractions $\frac{1}{2}$ and $\frac{1}{4}$. (Elementary)

Preparation

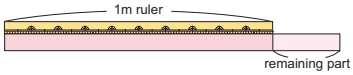
- 1 m tape or ruler, 1 m paper strip, A paper strip equivalent to the height of the board, markers, Scissors.

Assessment

- Think about ways on how to express a remaining part. F
- Appreciate and participate actively in measuring the sizes less than 1 using unit fractions. F
- Explain ways of measuring sizes of objects less than 1 metre using the idea of unit fraction. S
- Do the exercises correctly. S

17 Fractions

There is a 1 m tape. Let's measure the lengths of different objects by using the 1 m tape.
The length is 1 m and a remaining part. How can we represent the remaining part in metres?

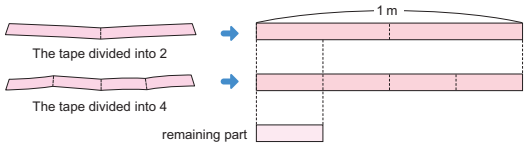


The length of the remaining part is less than 1 m, isn't it?

1 Fractions

How to represent the remaining part

1 Divide a 1 m tape into 2 and 4 equal parts respectively.



Let's compare the lengths of the divided parts respectively with the length of the remaining part.

Let's think about how to represent the given quantities in fractions.

The length of remaining part is equal to one part that is made by dividing 1 m into 4 equal parts.

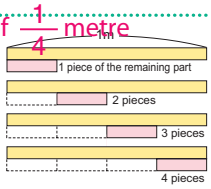
We learned that one part of a thing that is divided into 4 equal parts is expressed as $\frac{1}{4}$ of a thing in grade 2.

The length of one part made by dividing 1 m into 4 equal parts is called "one fourth of a metre" or "one quarter metre" and is written as $\frac{1}{4}$ m.

$\frac{1}{4}$ ③ ① ②

The meaning of 2 pieces of $\frac{1}{4}$ metre

2 How many pieces of the remaining part are equal to 1 m?

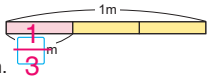


4 pieces of the length of the remaining part are equal to 1 m. The length of one part is obtained by dividing 1 m into 4 equal parts. The length of the remaining part is $\frac{1}{4}$ m.

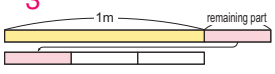
Exercise

How many metres are there?

① The length of one part is made by dividing 1 m into 3 equal parts is $\frac{1}{3}$ m.



② The length of the remaining part for which 3 pieces are equal to 1 m is $\frac{1}{3}$ m.



③ The length of one part that is made by dividing 1 m into 5 equal parts is $\frac{1}{5}$ m.

④ The length of the remaining part for which 2 pieces are equal to 1 m is $\frac{1}{5}$ m.

□ × □ = 177 178 = □ − □

Lesson Flow

1 Measure the left height of the black board with 1 m strip of paper.

T Ask the students to work in groups to measure the left height of the black board.

S Measure the height with a metre strip paper and try to think of how to represent the remaining part.

TN Purpose of this exercise is that students realise that there is a remaining part.

2 1 Divide 1 m tape into 2 and 4 equal parts respectively.

S Compare the length of each divided part to the remaining part and make connections using the unit fraction idea to determine the length of the remaining part.

TN Confirm the idea by letting the children divide a 1m tape into 2 and 4 parts equally.

S 1 part of 4 parts is equal to the remaining part, so the remaning part can be represented $\frac{1}{4}$ m

TN Confirm the answer and express it in words and also in figures. (eg. $\frac{1}{4}$ is one fourth metre.)

T Read and explain the important point to the class

T Introduce the main task.

3 2 Representation of how many pieces of the remaining part is equal to the length of 1m.

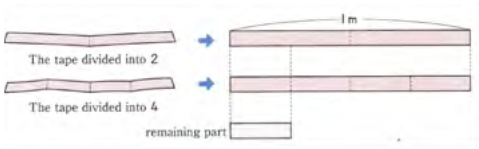
S Find out the number of pieces of the remaining part that make 1 m using the paper strip.

T Confirm the students answer.

4 Do the exercise.

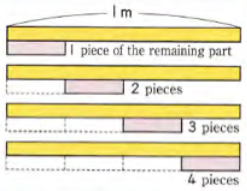
S Complete the exercises and summarise what they learned.

• Teacher's Notes •



The remaining part does not fit exactly into the tape that is divided into 2 equal parts. It fits exactly into the tape that is divided into 4 equal parts.

The length of the remaining part is $\frac{1}{4}$ m. $\frac{1}{4}$m is the fraction unit for the whole of $\frac{4}{4}$m.



Four pieces of the remaining parts is equal to the length of 1 m.

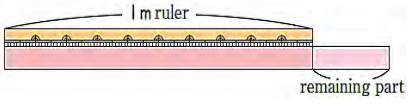
The fraction unit for the whole of 2/2m is 1/2m. | The fraction unit for the whole of 3/3m is 1/3m. | The fraction unit for the whole of 4/4m is 1/4m. | The fraction unit for the whole of 5/5m is 1/5m.

Sample Blackboard Plan

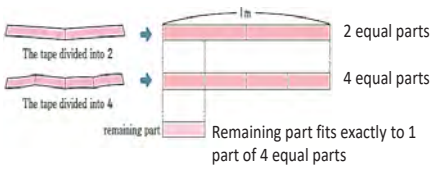
Date: Chapter: Fractions Sub-chapter/Topic: Fractions Lesson: 1 of 3

Task: Let's think about how to represent quantities as fractions.

Height of the Blackboard



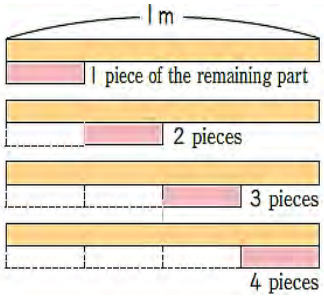
1 Let's divide a 1m tape into 2 and 4 equal parts.



MT

The length of one part made by dividing 1m into 4 equal parts is called "one fourth of a meter" or "one quarter meter" and is written as $\frac{1}{4}$ m.

2



4 pieces of the length of the remaining part are equal to 1m. The length of 1 part is obtained by dividing 1m into 4 equal parts. The length of the remaining part is $\frac{1}{4}$

The fraction unit of $\frac{4}{4}$m is $\frac{1}{4}$m

Exercise

(Refer to TM for Questions and Answers)

Summary

Unit 17

Unit: Fractions
Sub-unit: 1. Fractions
Lesson 2 of 3 (Single Period)

Textbook Page : p.179~p.180
Actual Lesson 125

Lesson Objectives

- To identify and undersand how fractions are represented.

Prior Knowledge

- How to represent remaining part using fraction. (Previous lesson)

Preparation

- Beaker, colour strips, ruler, markers

Assessment

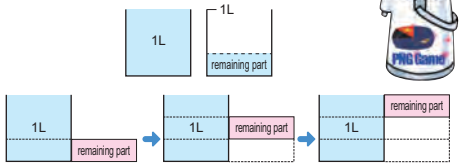
- Undersand how fractions are represented. F S
- Use the idea of unit fraction to identify and locate fractions. F

• Teacher's Notes •

Use other clear containers if there is no beaker. Make sure the container is transparent, divided equally into 3 parts and labelled in thirds.

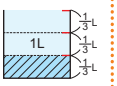
Expression of volume by fraction

3 The amount of water in the thermos bottle is 1 L and more. How much more in L?



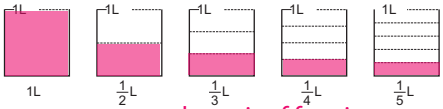
3 remaining parts make 1 L.

The amount for which 3 remaining parts are equal to 1 L is equal to the amount of one part. The amount is obtained by dividing 1 L into 3 equal parts. The amount is $\frac{1}{3}$ L.



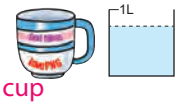
The size of the unit fraction

4 Colour in the portion of the amounts.

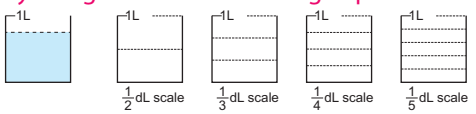


How to represent the unit of fraction

5 How many dL is the amount of water in the cup? Which measuring cup should we use to find?

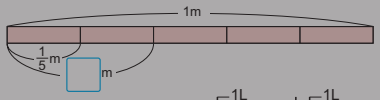


$\frac{4}{5}$ dL by using the third measuring cup

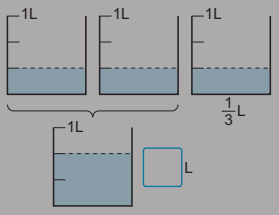


The amount of 3 sets of $\frac{1}{4}$ dL is called "three fourth of a decilitre" and is written as "$\frac{3}{4}$ dL."

6 When a 1 m tape is divided into 5 equal parts, how many metres are the length of 2 parts?



7 When a 1 L of milk is divided among 3 children equally, how many litres are there for 2 children?



Numbers such as $\frac{1}{3}$, $\frac{3}{4}$ and $\frac{2}{5}$ are called fractions. **The number below the bar** is called **denominator** and **the number above the bar** is called **numerator**.

$\frac{3}{4}$ ···numerator
···denominator

The denominator represents the number of equal parts of the original quantities, such as 1 m and 1 L, and the numerator represents the number of the collected parts.

□ + □ = 179　　180 = □ × □

Lesson Flow

1 **Review the previous lesson.**

2 **3 Discuss and find how many more L is equal to 1L of water in the thermos bottle.**

T How much of the remaining parts are equal to 1L?
S Discuss the question and share their ideas.
T Confirm their ideas by referring to the text book and explain the important point in the [ ]
T Introduce the main task.

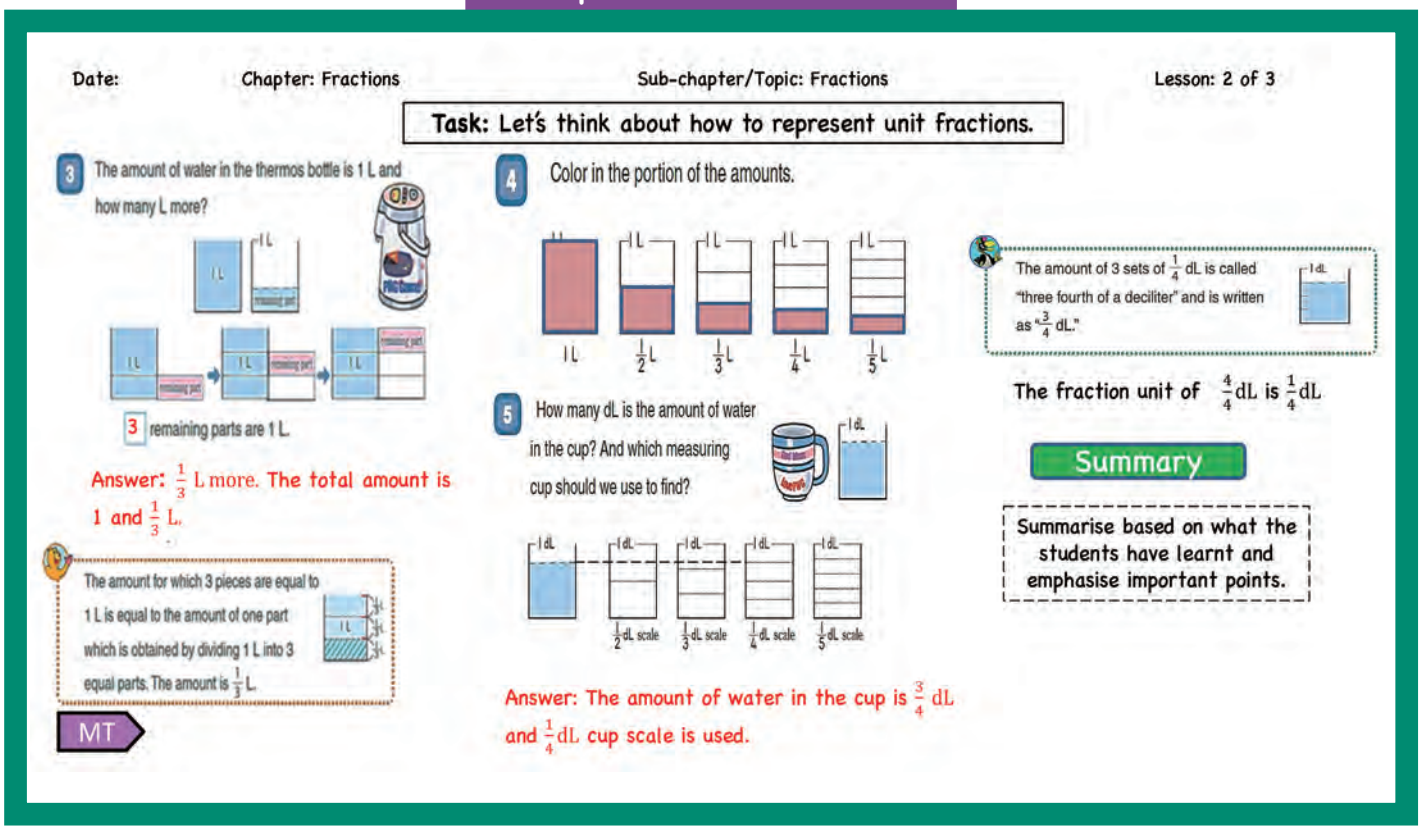
3 **4 Colour in the portion of the amounts.**

T Explain to the student that the amount of portion will be coloured is the size of the unit fraction in Litres.
S Use the prior knowledge of the unit fraction in meters to colour the portion of the size of the unit fraction in Litres.

4 **5 How to represent the unit of fraction.**

T Ask students to read question 5 to express their ideas and opinions.
S Answer the question and share their ideas and opinions to their friends.
T Confirms the students' ideas and opinions by using a ruler and place it horizontally from the 1dL shaded in blue right across to $\frac{1}{2}$ dL scale to $\frac{1}{5}$ dL. Draw a light line across to see which unit fraction aligns or fits exactly. Then it becomes the measuring cup.
S Identify $\frac{1}{4}$ dL is the measuring cup to be used as confirmed by the teacher.
T Read the important point in the [ ] with explanation.

Sample Blackboard Plan



Unit 17

Unit: Fractions
Sub-unit: 1. Fractions
Lesson 3 of 3 (Single Periods)

Textbook Page : p.180-p.181
Actual Lesson 126

Lesson Objectives

- To define and identify the position of the numerator and the denominator.
- To express how many times of the unit faction in length.

Prior Knowledge

- Concept of unit fraction (Previous lesson)

Preparation

- Charts and diagrams

Assessment

- Identify and locate denominator and numerator. F
- Do the exercise correctly. S

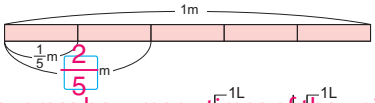
• Teacher's Notes •

- Use other clear containers if there is no beaker. Make sure the container is transparent, divided equally into 3 parts and labelled in thirds.

The amount of 3 sets of $\frac{1}{4}$ dL is called "three fourth of a decilitre" and is written as "$\frac{3}{4}$ dL."

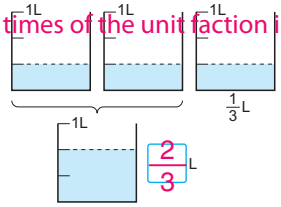
6 When a 1 m tape is divided into 5 equal parts, how many metres are the length of 2 parts?

To express how many times of the unit faction in length



7 When a 1 L of milk is divided among 3 children equally, how many litres are there for 2 children?

To express how many times of the unit faction in volume



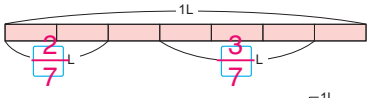
Numbers such as $\frac{1}{3}$, $\frac{3}{4}$ and $\frac{2}{5}$ are called fractions. **The number below the bar** is called **denominator** and **the number above the bar** is called **numerator**.

$\frac{3}{4}$ ···numerator
···denominator

The denominator represents the number of equal parts of the original quantities, such as 1 m and 1 L, and the numerator represents the number of the collected parts.

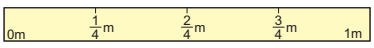
Exercise

1 Let's represent fractions.



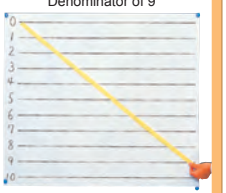
2 Let's colour in the portion of $\frac{4}{5}$ dL.

Measuring Different Things Using Fractions



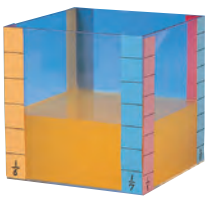
① Let's make a ruler to measure fractions by dividing a 1 m tape into equal sections. Make a ruler to measure fractions with denominators of 3, 5, 6, 7, 9 and 10 and then measure the lengths of different objects.

How to Make a Ruler with Denominator of 9



② Let's make a 1 L measuring cup to measure fractions by constructing a scale of fractions.

How to Construct a Fraction Scale of Which the Denominator Is 7



Lesson Flow

1 Review of previous lesson.

T Introduce the main task.

2 6 Express how many times of the unit fraction in length.

S Express how many metres in 1 m tape is being divided into 5 equal parts when the length is 2 parts in unit fraction.

3 7 Express how many times of the unit fraction in volume.

S Express how many litres are there for 2 children when 1 L of milk is divided among 3 children in unit fraction.

T Explain to the students what a numerator and a denominator is in the main important points in [ ] and [ ].

4 Complete the exercise.

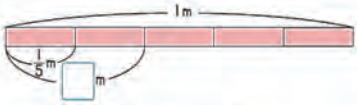
Sample Blackboard Plan

Date: Chapter: Fractions Sub-chapter/Topic: Fractions Lesson: 3 of 3

Task: Let's express fractions in length and volume.

MT

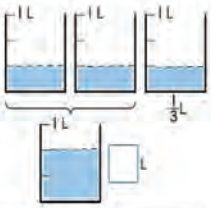
6 When a 1 m tape is divided into 5 equal parts, how many meters are the length of 2 parts?



Amount is 1 and 1/3 L

Answer: 2/5 m

7 When a 1 L of milk is divided among 3 children equally, how many liters are there for 2 children?



Numbers such as $\frac{1}{3}$, $\frac{3}{4}$ and $\frac{2}{5}$ are called fractions. The number below the bar is called denominator and the number above the bar is called numerator.

$\frac{3}{4}$ (3 ... numerator, 4 ... denominator)

The denominator represents the number of equal parts of the original quantities, such as 1 m and 1 L, and the numerator represents the number of the collected parts.

Exercise

(Refer to TM for Question and Answers)

Summary

Summarise based on what the students have learnt and emphasise important points.

Unit 17

Unit: Fractions
Sub-unit: 2. Structure of Fractions
Lesson 1 of 1 (Double Period)

Textbook Page : p.182
Actual Lesson 127

Sub-unit Objectives

- To understand the structures of the fractions based on the unit fractions.
- To understand the relationship between fractions and decimals.

Lesson Objectives

- To understand the structure of fraction based on unit fraction.
- To compare the size of the fractions.

Prior Knowledge

- Colour the size of the fraction unit with the given portion.
- The sets of fraction unit.
- Definition and position of the words numerator and denominator with fraction examples.

Preparation

- Refer to the blackboard plan.

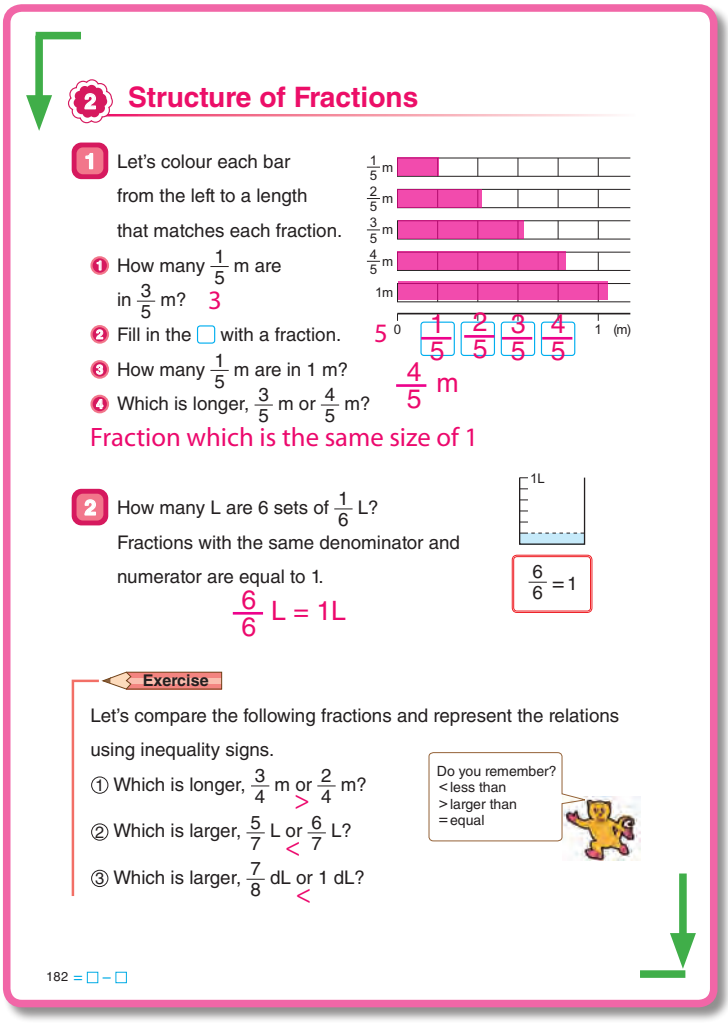
Assessment

- Know how to compare and find relationship among fractions with same denominators. F
- Be eager to compare and find relationship among fractions with the same denominator. F
- Compare and find relationship with fractions less than 1 using unit idea. F
- Do the exercises correctly. S

• Teacher's Notes •

Fractions whose numerators are 1, such as $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{1}{5}$ are unit fractions. Fractions can be thought of as multiples of the unit fractions. For example, $\frac{2}{3}$ is twice the size of $\frac{1}{3}$ and smaller than 1.

3 times the unit fraction of $\frac{1}{3}$ is $\frac{3}{3}$ which is also equal 1.



2 Structure of Fractions

1 Let's colour each bar from the left to a length that matches each fraction.

① How many $\frac{1}{5}$ m are in $\frac{3}{5}$ m? 3

② Fill in the □ with a fraction. $\frac{4}{5}$ m

③ How many $\frac{1}{5}$ m are in 1 m? 5

④ Which is longer, $\frac{3}{5}$ m or $\frac{4}{5}$ m?

Fraction which is the same size of 1

2 How many L are 6 sets of $\frac{1}{6}$ L?

Fractions with the same denominator and numerator are equal to 1.

$\frac{6}{6}$ L = 1L

$\frac{6}{6} = 1$

Exercise

Let's compare the following fractions and represent the relations using inequality signs.

① Which is longer, $\frac{3}{4}$ m or $\frac{2}{4}$ m? >

② Which is larger, $\frac{5}{7}$ L or $\frac{6}{7}$ L? <

③ Which is larger, $\frac{7}{8}$ dL or 1 dL? <

Do you remember?
< less than
> larger than
= equal

182 = □ – □

Lesson Flow

1 ① Use the diagram to colour the given lengths that matches each fraction.

T Ask the students to use the diagram to show given lengths by colouring each fraction. Advice the students to colour only and not to write or fill in the ☐ at the bottom of the diagram.
S Colour the given lengths in fraction using the diagram.
T Introduce the main task.

2 ① Read and write the answers.

TN ① ② ③ Explain to the students that idea of unit fraction is used.
④ Comparison of the size of the fraction

3 ② Fraction which is the same size of 1.

T How many litres are coloured?
S $\frac{1}{6}$ L
T What is the unit fraction?
S $\frac{1}{6}$ L
S Use the diagram to explain their ideas or answers to the question" How many L are 6 sets of $\frac{1}{6}$ L?
T Confirm the students' ideas and answers by giving the explanation: Fractions whose numerators and denominators are the same are equal to 1.

4 Do the exercise.

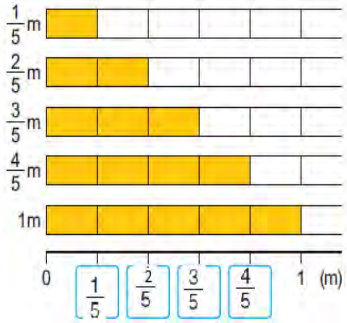
TN Refer to TN

Sample Blackboard Plan

Date: Chapter: Fractions Sub-chapter/Topic: Structure of Fractions Lesson: 1 of 1

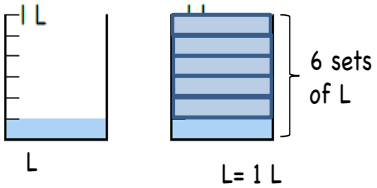
Task: Let's compare fractions and represent them.

① Colour each bar from the left to a length that matches each fraction.



MT
① How many $\frac{1}{5}$ m are in $\frac{3}{5}$ m ? Answer: 3
② Fill the ☐ with a fraction.
③ How many $\frac{1}{5}$ m are in 1 m? Answer: 5
④ Which is longer, $\frac{3}{5}$ m or $\frac{4}{5}$ m ? $\frac{4}{5}$

② How many L are 6 sets of $\frac{1}{6}$ L?



Answer: 1 L

Fractions with the same denominator and numerator are equal to 1.

$\frac{6}{6} = 1$

Exercise

Let's compare the following fractions and represent the relations using inequality signs.

① Which is longer, $\frac{3}{4}$ m or $\frac{2}{4}$ m?
② Which is larger, $\frac{5}{7}$ L or $\frac{6}{7}$ L?
③ Which is larger, $\frac{7}{8}$ dL or 1 dL?

(1) $\frac{3}{4} > \frac{2}{4}$
(2) $\frac{5}{7} < \frac{6}{7}$
(3) $1 = \frac{8}{8}$ $\frac{7}{8} < \frac{8}{8}$

Summary

When comparing fractions with the same denominator. Compare the numerator, the Faction with the large number is greater or more.

Unit 17

Unit: Fractions
Sub-unit: 3. Addition and Subtraction of Fractions
Lesson 1 of 1 (Single Period)

Textbook Page : p.183
Actual Lesson 128

Sub-unit Objectives

- To understand simple calculation of addition and subtraction of proper fractions (less than 1) with the same denominators.

Lesson Objectives

- To explain addition and subtraction of fractions using the idea of unit fraction.
- To calculate simple addition and subtraction of fractions with the same denominator.

Prior Knowledge

- The size and the unit of fraction by colouring the portion of the given fractions.
- How to represent the fraction unit. Eg. 2 sets of $\frac{1}{5}$ L is $\frac{1}{5}$ L.
- The structure of fraction.

Preparation

- Diagrams of 1 and 2

Assessment

- Add and subtract simple fractions whose denominators are same. F
- Do the exercises correctly. S

• Teacher's Notes •

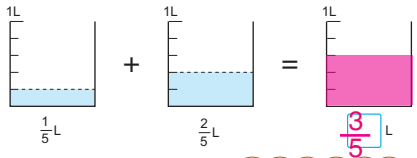
Pose following questions to confirm important point.

1. What is observed or noticed from the denominators in addition and subtraction of the fractions?
2. What is done with the **numerators** in **addition** of fraction when the denominators are same?
3. What is done with the numerators in subtraction of fraction when the denominators are same?
4. In addition and subtraction of fractions when the denominators are same keep the denominator and add or subtract the numerators.

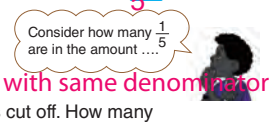
3 Addition and Subtraction of Fractions

Addition of fraction with same denominator

1 Elijah drank $\frac{1}{5}$ L of milk yesterday and $\frac{2}{5}$ L of milk today.
How many litres did he drink altogether?



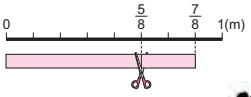
$\frac{1}{5}+\frac{2}{5}=\frac{3}{5}$

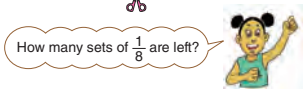


Subtraction of fraction with same denominator

2 From a $\frac{7}{8}$ m tape, $\frac{5}{8}$ m was cut off. How many metres are left?

$\frac{7}{8}-\frac{5}{8}=\frac{2}{8}$





Exercise

1 Let's represent a calculation $\frac{2}{6}+\frac{3}{6}$ below.

2 Let's calculate.

① $\frac{2}{7}+\frac{4}{7}$ $\frac{6}{7}$ ② $\frac{3}{4}-\frac{1}{4}$ $\frac{2}{4}=\frac{1}{2}$ ③ $\frac{4}{5}-\frac{2}{5}$ $\frac{2}{5}$

Lesson Flow

1 ① Read and understand the addition problem.

T Ask the students to observe the diagram and solve the mathematical expression.
S Explain the situation using diagram.
S Colour the answer and fill in the box.
TN Students realise that when adding fractions with the same denominators, add the numerators and keep the denominators.
T Introduce the main task.

2 ② Read and understand the subtraction problem.

T Ask the students to observe the diagram and solve the mathematical expression.
S Explain the situation using diagram.
S Find the answer and fill in the box.
TN Students realise that when subtracting fractions with same denominators, subtract the numerators and keep the denominators.

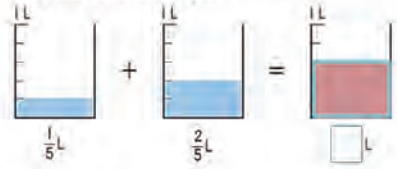
3 Do the exercise.

Sample Blackboard Plan

Date: Chapter: Fractions Sub-chapter/Topic: Addition and Subtraction of Fractions Lesson: 1 of 1

Task: Let's think about adding and subtracting fractions.

1 Elijah drank $\frac{1}{5}$ L of milk yesterday and $\frac{2}{5}$ L of milk today. How many liters did he drink altogether?



How many are in the amount?

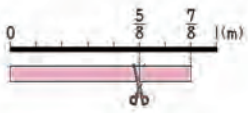
1/5 + 2/5 = 3/5

1/5 is 1 set of 1/5
2/5 is 2 sets of 1/5
1 + 2 is 3
3 sets of 1/5 is 3/5

MT

2 From a $\frac{7}{8}$ m tape, $\frac{5}{8}$ m was cut off. How many meters are left.

$\frac{7}{8} - \frac{5}{8} = \square$



7/8 - 5/8 = 2/8

7/8 is 7 sets of 1/8
5/8 is 5 sets of 1/8
7 - 5 is 2
2 sets of 1/8 is 2/8
Which is 1/4 by dividing numerator and denominator with 2

Exercise

(Refer to TM for Question and Answers)

Summary

When the denominators are same in the addition and subtraction of fractions keep the denominators and add or subtract the numerators.

Unit 17

Unit: Fractions
Sub-unit: Exercise and Evaluation
Lesson 1 of 1 (Double Period)

Textbook Page : p.184~p.185
Actual Lesson 129

Lesson Objectives

- To deepen the understanding of what they learned in this unit.

Prior Knowledge

- Whole contents of the unit.

Assessment

- Solve the exercises correctly. F S

• Teacher's Notes •

Use 30 minutes for the exercise and give the evaluation test after that.

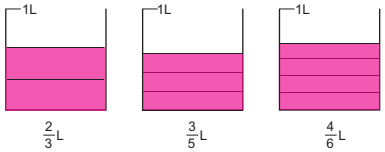
Exercise

1 Fill in the ☐ with a number. Page 182

① $\frac{3}{5}$ dL is [3] sets of $\frac{1}{5}$ dL. ② [$\frac{5}{6}$] m is 5 sets of $\frac{1}{6}$ m.

③ [3] sets of $\frac{1}{8}$ L is $\frac{3}{8}$ L. ④ 5 sets of $\frac{1}{5}$ cm is [1] cm.

2 Let's colour the portion for the following numbers. Pages 179 ~ 181



3 Which is bigger? Fill in the ☐ with inequality signs. Page 182

① $\frac{2}{3}$ [>] $\frac{1}{3}$ ② $\frac{5}{8}$ [<] $\frac{7}{8}$ ③ 1 [>] $\frac{3}{4}$

4 Let's calculate. Page 183

① $\frac{1}{4}+\frac{3}{4}$ 1 ② $\frac{2}{8}+\frac{4}{8}$ $\frac{6}{8}$ ③ $\frac{5}{6}-\frac{4}{6}$ $\frac{1}{6}$ ④ $1-\frac{1}{3}$ $\frac{2}{3}$

Let's calculate. Grade 3 Do you remember?

① 24÷6 4 ② 35÷7 5 ③ 9÷1 9 ④ 0÷7 0

⑤ 12÷5 2 r 2 ⑥ 40÷9 4 r 4 ⑦ 31÷4 7 r 3 ⑧ 66÷8 8 r 2

Problems

1 A 1 m tape was divided into 6 equal parts, and we took 4 pieces of those parts. Let's represent the section that was taken by fractions.
● Understanding means of fractions. $\frac{4}{6}$ $\frac{2}{3}$

2 Fill in the ☐ with a number.
● Understanding the system of fractions.

① 3 sets of $\frac{1}{4}$ m is [$\frac{3}{4}$] m. ② [4] sets of $\frac{1}{7}$ L is $\frac{4}{7}$ L.

③ 4 sets of [$\frac{1}{10}$] m is $\frac{4}{10}$ m. ④ [4] sets of $\frac{1}{4}$ dL is 1dL.

3 Let's make an expression of the answer $\frac{7}{8}$ by filling in the ☐ with number.
● Understanding the addition of fractions.

[$\frac{5}{8}$] + [$\frac{2}{8}$] = $\frac{7}{8}$

4 There are 5 cards from 1 to 5 as shown below.
Let's make fractions with the denominator 5 using these cards as numerator.
● Understanding the size and the structure of fractions.

[1] [2] [3] [4] [5] $\frac{\square}{5}$

① Make a fraction for which 3 sets are equal to $\frac{3}{5}$. $\frac{1}{5}$

② Make a fraction that is equal to 1. $\frac{5}{5}$

③ Make fractions that are smaller than $\frac{4}{5}$. $\frac{3}{5}$, $\frac{2}{5}$, $\frac{1}{5}$

④ Make fractions that are larger than $\frac{3}{5}$ and smaller than 1. $\frac{4}{5}$

184 = ☐ − ☐ ☐ × ☐ = 185

Lesson Flow

1 ① **Understand the structure of the fraction.**

2 ② **Colour the portion with the numbers.**

TN Confirm the meaning of denominator and numerator before colouring.

3 ③ **Compare the fractions using inequality signs.**

TN Let students compare considering each pair of fraction.

4 ④ **Calculate addition and subtraction of fractions.**

TN Not only confirming the answer but the meaning of calculation by drawing picture.

5 ① **Understand the meaning of fraction.**

TN Let students draw a tape diagram to understand the meaning.

6 ② **Understand the structure of fraction.**

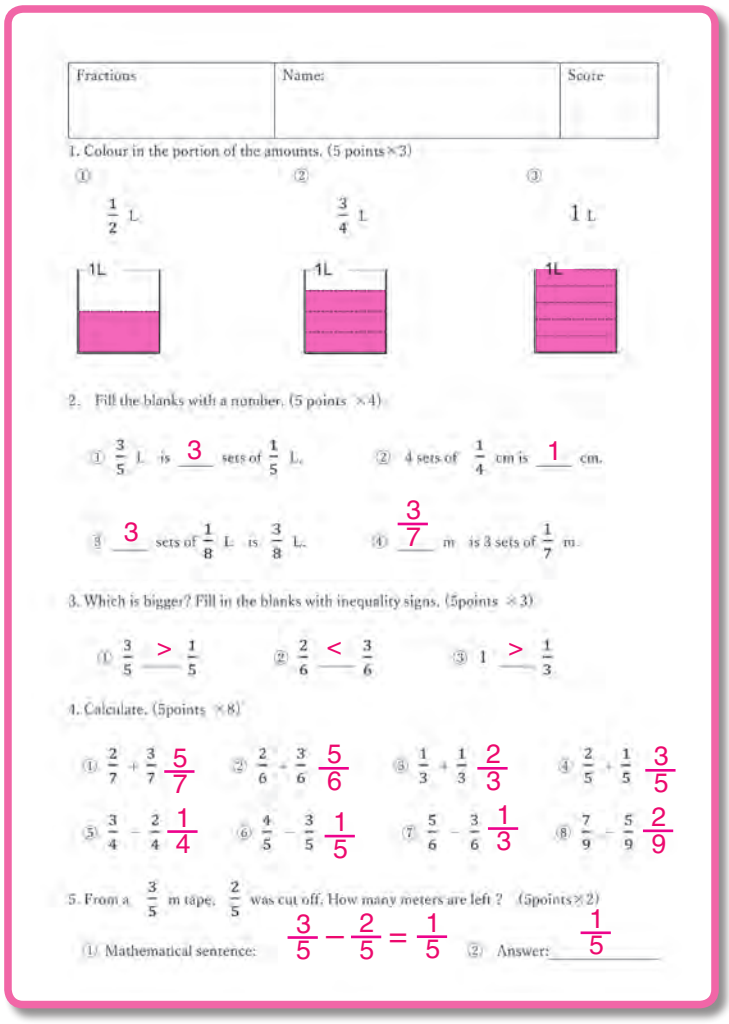
TN Assist students who do not understand by drawing figure or number line.

7 ③ **Understand the structure of addition and subtraction of fraction.**

TN Let students understand that in addition of fractions when the denominators are same keep the denominator and add the numerators.

8 ④ **Understand the size and structure of fraction.**

TN Let students explain the reason in each question using tape diagaram.



Fractions	Name:	Score

1. Colour in the portion of the amounts. (5 points×3)

① $\frac{1}{2}$ L ② $\frac{3}{4}$ L ③ 1 L

2. Fill the blanks with a number. (5 points ×4)

① $\frac{3}{5}$ L is 3 sets of $\frac{1}{5}$ L. ② 4 sets of $\frac{1}{4}$ cm is 1 cm.

③ 3 sets of $\frac{1}{8}$ L is $\frac{3}{8}$ L. ④ $\frac{3}{7}$ m is 3 sets of $\frac{1}{7}$ m.

3. Which is bigger? Fill in the blanks with inequality signs. (5points ×3)

① $\frac{3}{5}$ > $\frac{1}{5}$ ② $\frac{2}{6}$ < $\frac{3}{6}$ ③ 1 > $\frac{1}{3}$

4. Calculate. (5points ×8)

① $\frac{2}{7}+\frac{3}{7}=\frac{5}{7}$ ② $\frac{2}{6}+\frac{3}{6}=\frac{5}{6}$ ③ $\frac{1}{3}+\frac{1}{3}=\frac{2}{3}$ ④ $\frac{2}{5}+\frac{1}{5}=\frac{3}{5}$

⑤ $\frac{3}{4}-\frac{2}{4}=\frac{1}{4}$ ⑥ $\frac{4}{5}-\frac{3}{5}=\frac{1}{5}$ ⑦ $\frac{5}{6}-\frac{3}{6}=\frac{1}{3}$ ⑧ $\frac{7}{9}-\frac{5}{9}=\frac{2}{9}$

5. From a $\frac{3}{5}$ m tape, $\frac{2}{5}$ was cut off. How many meters are left? (5points×2)

① Mathematical sentence: $\frac{3}{5}-\frac{2}{5}=\frac{1}{5}$ ② Answer: $\frac{1}{5}$

End of Chapter Test: Chapter 17 **Date:**

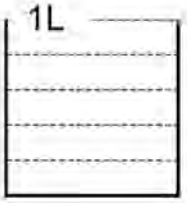
Fractions	Name:	Score

1. Colour in the portion of the amounts. (5 points×3)

① $\frac{1}{2}$ L

② $\frac{3}{4}$ L

③ 1 L



2. Fill the blanks with a number. (5 points ×4)

① $\frac{3}{5}$ L is ____ sets of $\frac{1}{5}$ L.

② 4 sets of $\frac{1}{4}$ cm is ____ cm.

③ ____ sets of $\frac{1}{8}$ L is $\frac{3}{8}$ L.

④ ____ m is 3 sets of $\frac{1}{7}$ m.

3. Which is bigger? Fill in the blanks with inequality signs. (5points ×3)

① $\frac{3}{5}$ ____ $\frac{1}{5}$

② $\frac{2}{6}$ ____ $\frac{3}{6}$

③ 1 ____ $\frac{1}{3}$

4. Calculate. (5points ×8)

① $\frac{2}{7} + \frac{3}{7}$

② $\frac{2}{6} + \frac{3}{6}$

③ $\frac{1}{3} + \frac{1}{3}$

④ $\frac{2}{5} + \frac{1}{5}$

⑤ $\frac{3}{4} - \frac{2}{4}$

⑥ $\frac{4}{5} - \frac{3}{5}$

⑦ $\frac{5}{6} - \frac{3}{6}$

⑧ $\frac{7}{9} - \frac{5}{9}$

5. From a $\frac{3}{5}$ m tape, $\frac{2}{5}$ was cut off. How many meters are left ? (5points×2)

① Mathematical sentence:

② Answer:_____

Chapter 18 Math Sentences Using the □

1. Unit Objectives

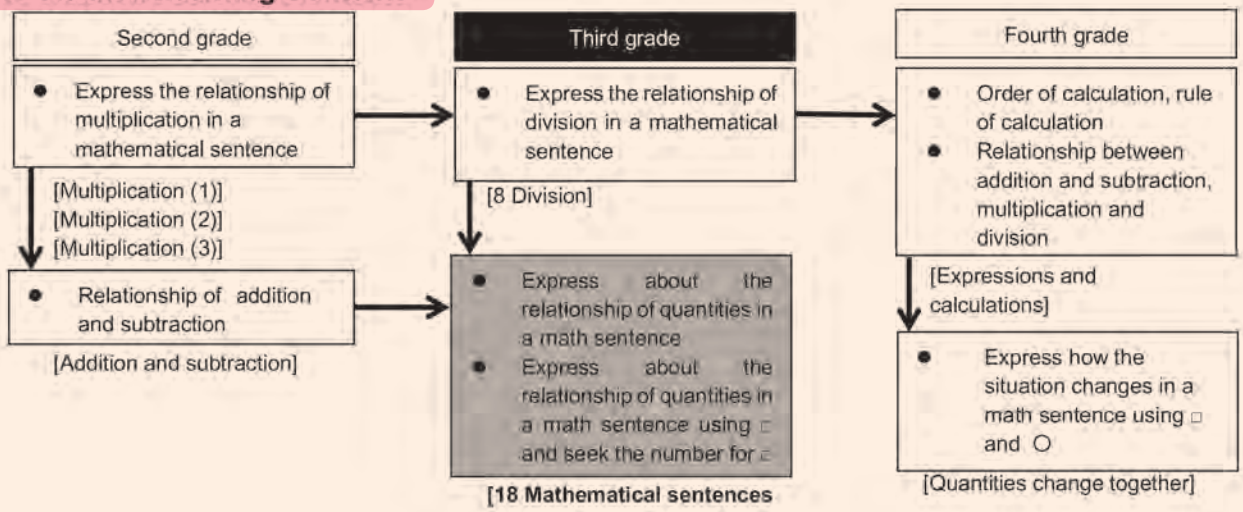
- To understand math sentences which represent mathematical relations. (3.4.1a)
- To make math sentences to represent mathematical relations. (3.4.1a)
- To make math sentence using □ and find the number which enters in □. (3.4.1b and c)

2. Teaching Overview

Students often forget the operations after getting the answer. It may result that the meaning of operations or relations of numbers making the answer could be forgotten. In this unit, students think about meanings and relations of numbers through mathematical sentences. In earlier learning of mathematics, students have thought of meaning of mathematical sentences with concrete numbers. Here, they think about the meaning and number relations represented as mathematical sentences with □ or ○ which are not concrete numbers but generalised. It helps students to understand the meaning of structure or composition of mathematical sentences.

Maths Sentences of Addition and Multiplication : Students are to come up with a mathematical sentence with words based on a given situation. They change the mathematical sentence with □ or ○. They should also understand that □ or ○ represents any numbers, and also they could be a only number if there are more given conditions or numbers.

3. Related Learning Contents



Unit 18

Unit: Math Sentences Using the □
Sub-unit: 1. Math Sentences of Addition
Lesson 1 of 2 lessons (Double Period)

Textbook Page : p.186~p.187
Actual Lesson 130

Sub-unit Objectives

- To make math sentence with words.
- To make math sentence using ☐ and find the number which enters in ☐.

Lesson Objectives

- To make math sentence of addition or multiplication using given information.

Prior Knowledge

- Multiplication (Grade 2 and 3)
- Addition and subtraction (Grade 2 and 3)

Preparation

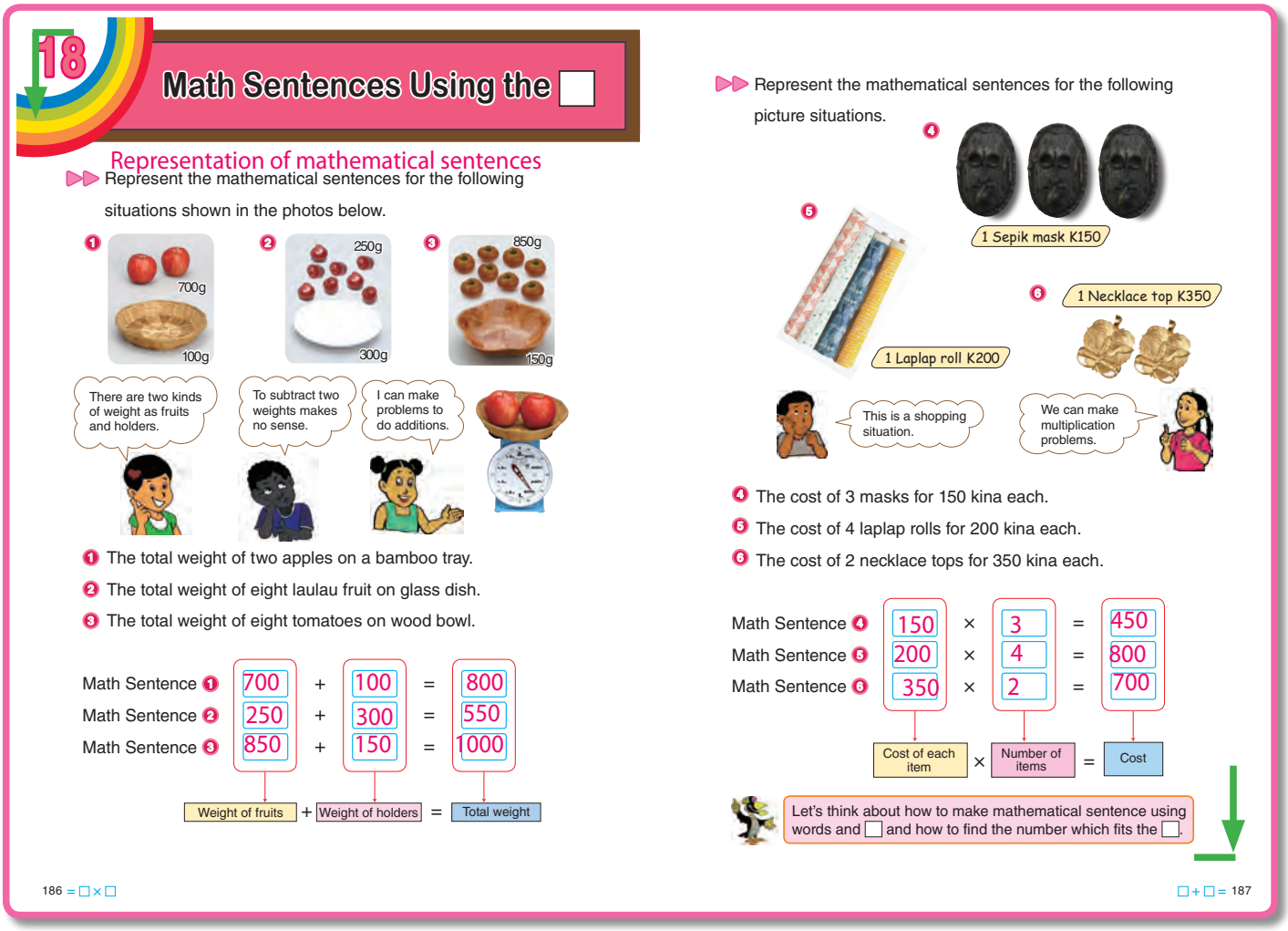
- Board Preparation

Assessment

- Make math sentence using a given information. F
- Understand how to make math sentence using given information. S

• Teacher's Notes •

Students had been working with math expression with numbers to find their answers. This time they will think about what numbers to fill in the ☐ in order to represent the mathematics problems.



Lesson Flow

1 ▶▶ Think about how to make mathematical sentence of addition using photos.

T Introduce the main task.
T Let students observe photo ❶ and make a mathematical sentence.
T What kind of math sentence can you make?
S The total weight of 2 apples in the bamboo tray. 700 + 100 = 800
T What about ❷ and ❸?
S ❷ The total weight of eight laulaus on the glass dish. 250 + 300 = 550
❸ The total weight of eight tomatoes on the wooden bowl. 850 + 150 = 1000

2 Compare the three situations.

T What is common among all three mathematical sentences?
S Adding weight of fruits and weight of case.
S When representing mathematical sentence, it is going to be 'weight of fruits' + 'weight of holder' = 'total weight'.

3 Think about how to make mathematical sentence of multiplication using pictures.

T Let students observe drawing ❹ and make a mathematical sentence.
T What kind of mathematical sentence can you make?
S The cost of 3 sepik mask for 150 kina each. 3 × 150 = 450
T Let students think about the other two drawings in ❺ and ❻.

4 Compare the three situations.

T What is common among all three mathematical sentences?
S Multiplying cost of each material by the number of materials.
T When representing in mathematical sentence, it is going to be 'cost of each item' + 'number of items' = 'total cost'

Sample Blackboard Plan

Date: Chapter: Math Sentences Sub-chapter/Topic: Math sentence of addition Lesson: 1 of 2

Task: Let's represent mathematical sentences.

MT

Represent the mathematical sentences for each situation

❶ The total weight of two apples with the bamboo tray.
❷ The total weight of eight laulau fruit on the glass plate.
❸ The total weight of eight tomatoes in the wooden bowl.

Math Sentence ❶	700	+	100	=	800
Math Sentence ❷	250	+	300	=	550
Math Sentence ❸	850	+	150	=	1000
	Weight of fruits	+	Weight of case	=	Total weight

❹ The cost of 3 masks for 150 kina each.
❺ The cost of 4 lalap rolls for 200 kina each.
❻ The cost of 2 necklace tops for 350 kina each.

Math Sentence ❹	150	×	3	=	450
Math Sentence ❺	200	×	4	=	800
Math Sentence ❻	350	×	2	=	700
	Cost of each thing	×	Number of things	=	Cost

1

Represent the mathematical sentences for the following picture situations.

Summary

Summarise based on what the students have learnt and emphasise important points.

Unit 18

Unit: Math Sentences Using the □
Sub-unit: 1. Math Sentences of Addition
Lesson 2 of 2 (Double Period)

Textbook Page : p.188~p.189
Actual Lesson 131

Lesson Objectives

- To make math sentence of addition using □ for the unknown number.
- To understand how to find the unknown number that fits in the □.

Prior Knowledge

- Making math sentences to represent mathematical relations(Previous lesson).

Preparation

- Refer to the blackboard plan for diagram.

Assessment

- Make math sentence using □ and think about how to find the unknown number for the □. F
- Do the exercise correctly. S

• Teacher's Notes •

Using diagram representation and mathematical sentence with words makes it easier to identify what is unknown and what is known before they find the missing number for the □.

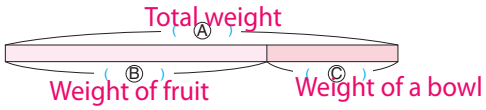
1 Math Sentences of Addition

1 Mathematical sentences involving addition

1 Let's think about the following problem.

There are 900 g of mandarins in a bowl. The bowl weighs 300 g. What is the weight of mandarins in g?

1 Let's complete the diagram below by filling in the ( ) with words. Weight of mandarins | Weight of a bowl | Total weight



2 Let's complete the mathematical sentence with words from the diagram 1.

Weight of fruit + Weight of bowl = Total weight

3 Let's represent the unknown number in the mathematical sentence by using □.

□ + 300 = 900

4 Let's think about how to find the number in the □.

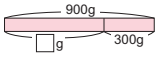
Kekeni's idea

To find the number which fits □ + 300 = 900, put numbers, 100, 200, … into □.

100 + 300 < 900
200 + 300 < 900
⋮
600 + 300 = 900

Naiko's idea

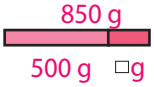
Consider how to use the diagram.



□ + 300 = 900
□ = 900 − 300
= 600

2 Solving unknown in mathematical sentences involving addition

2 The weight of a 500 g avocado on the plate is 850 g. What is the weight of the plate in g ? Let's draw the diagram or write a mathematical sentence for the weight of the plate by using □ g and find □.



500 + □ = 850
□ = 850 − 500
□ = 350
Answer: 350 g

Exercise

The weight of 400 g bananas in the basket is 600 g. What is the weight of the basket in g? Let's draw the diagram or write mathematical sentence for the weight of the basket by using □ g and find □.

Answer: 200 g

188 = □ − □

□ × □ = 189

Lesson Flow

1 ❶❶❷ Make mathematical sentence using words.

T ❶ Let students complete the diagram by filling in the word in A, B and C

TN Explain the relation of weight of fruit, weight of bowl and total weight by using the tape diagram.

T ❷ Let's make a math sentence based on the information of tape diagram.

S Weight of mandarins + Weight of bowl = Total weight.

T Introduce the main task.

2 ❸ Making mathematical sentence using □ for unknown number.

T Which one is unknown?

S Weight of Mandarins

T Let's make mathematical sentence using □ for unknown number.

S □ + 300 = 900

3 ❸❹ Think about how to find the □.

T How can we find the number which should be in □?

S Inserting the number 100, 200,300 …. one by one, and when we write 600 the answer becomes 900 (Kekeni's idea) .

S When observing the tape diagram, total weight is 900 g. A number which subtract 300 from 900 will be □. (Naiko's idea)

TN Let students think about how to find □ by observing the tape diagram. Naiko's idea will be the basis for next steps.

4 ❷ Draw a tape diagram, make mathematical sentence using □ and find the number which can go in □.

T Ask students, total weight, weight of fruit and unknown weight.

S Total weight is 850 g, weight of avocado is 500 g but the weight of bowl is unknown.

T Let's draw a tape diagram and write a math sentence.

S Solve mathematical sentence.

S Understand that the Total weight – weight of avocado = weight of bowl.

5 Do the exercise.

TN
- Confirm that it is easy to make math sentence when you draw a tape diagram correctly.
- When the mathematical sentence is addition, you have to do subtraction to find the answer.
- When the mathematical sentence is subtraction, you have to do addition to find the answer.

Sample Blackboard Plan

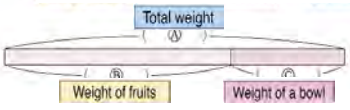
Date: Chapter: Math Sentences Sub-chapter/Topic: Math sentence of addition Lesson: 2 of 2

Task: Let's find the unknown in an addition sentence.

1

There are 900g of mandarins in a bowl that weighs 300g. What is the weight of mandarins in g ?

❶ Let's complete the diagram below by filling the ( ) with words.



❷ Let's complete the mathematical sentence with words from the diagram ❶.

Weight of fruits + Weight of a bowl = Total weight

MT

❸ Let's represent the unknown number in the mathematical sentence by using □.

□ + 300 = 900

❹ Let's think about how to find the number in the □.

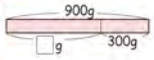
Kekeni's idea

To find the number which fits □ + 300 = 900, put numbers, 100, 200, … into □.

100 + 300 < 900
200 + 300 < 900
⋮
600 + 300 = 900

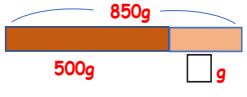
Naiko's idea

Consider how to use the diagram.



□ + 300 = 900
□ = 900 − 300

2 The weight of a 500g avocado on the plate is 850g. What is the weight of the plate in g ? Let's draw the diagram or write mathematical sentence for the weight of the plate by using □ g and find □.



500 + □ = 850
□ = 850 − 500
□ = 350
Answer: 350g

Exercise

(Refer to TM for Question and Answers)

Summary

Unit 18

Unit: Math Sentences Using the □
Sub-unit: 2. Math Sentences of Multiplication
Lesson 1 of 1(Double Period)

Textbook Page : p.190~p.191
Actual Lesson 132

Sub-unit Objectives

- To make math sentence with words.
- To make math sentence of multiplication using ☐ and find the number for the ☐.

Lesson Objectives

- To make math sentence of multiplication using ☐ for the unknown number.
- To understand how to find the unknown number for the ☐.

Prior Knowledge

- Mathematical relations (First lesson of the unit).

Preparation

- Diagrams according to board plan

Assessment

- Make mathematical sentence using ☐ and think about how to find the number which enters in ☐. F
- Do the exercise correctly. S

• Teacher's Notes •

It may be difficult for some students to find the unknown or □. Ambai's idea may be comfortable for them. However, Sare's idea is the basis for next steps for finding the unknown □.

2 Math Sentences of Multiplication

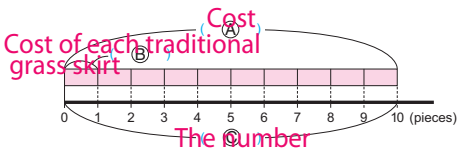
1 Mathematical sentences involving multiplication

Let's think about how to solve the following problem.

We bought 10 traditional grass skirts and paid 500 kina.
What is the cost of one traditional grass skirt?

1. Let's complete the diagram below by filling in the ( ) with words.

Cost of each traditional grass skirt
The number
Cost



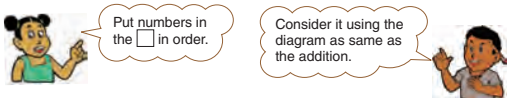
2. Let's complete the mathematical sentence with words from the diagram.

The number × Cost of each grass skirt = Cost

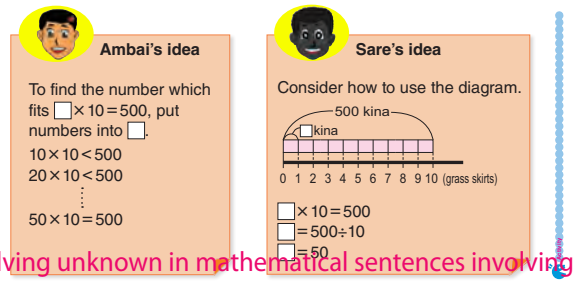
3. Let's represent the unknown number in a mathematical sentence by using □.

10 × 50 = 500

4. Let's think about how to find the number in the □.



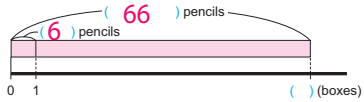
190 = □ × □



Solving unknown in mathematical sentences involving multiplication

2. You divide 66 pencils into 6 pencils to each box.
How many boxes of 6 pencils can you fill?

1. Let's draw the diagram by representing the unknown number by using □.



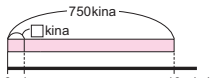
2. Let's make mathematical sentences with words and by using □.

11 × Number of pencils in each box = 66
11 × 6 = 66

3. Let's find the number which fits the □ by using various ways.

Exercise

The cost of 10 m tug rope for ship is 750 kina. Write a mathematical sentence by using □ to find the cost of 1 m tug rope.



Answer. K75

□ + □ = 19

Lesson Flow

1 ❶❶❷ Make mathematical sentence using words.

T ❶ Let students complete the diagram by filling the word in A, B and C

TN Explain the relation of three things by using tape diagram.

T ❷ Let students make math sentence based on the information of tape diagram.

S The number of grass skirts × Cost of each grass skirts = Total cost.

T Introduce the main task.

2 ❸ Making mathematical sentence using □ for unknown number.

T Which one is unknown?

S Cost of each grass skirts

T Let's make mathematical sentence using □ for unknown number.

S 10 × □ = 500

3 ❸❹ Think about how to find the □.

T How should we find the number which fits in □?

S Inserting the number 10, 20,30 …. one by one, and when we insert 50 the answer become 500 (Ambai's idea) .

T When observing the tape diagram, total cost is 500 kina. A number which they bought is 10, so a number which 500 is divided by 10 will be □. (Sare's idea)

TN Let students think about how to find □ by observing tape diagram. Sare's idea will be the basis for next steps.

4 ❷ Draw a tape diagram, make mathematical sentence using □ and find the number which can go in □.

T ❶ Ask students about the total number of pencils, the number of pencils in each box and the unknown number.

S Total number of pencil is 66, 6 pencils in each box but we do not know how many boxes.

T ❷ Let's draw a tape diagram and write a mathematical sentence.

S □ × 6 = 66

T Solve math sentence.

□ = 66 ÷ 6 = 11

T ❸ Let students understand that the number of boxes × the number of pencils in each box = total number of pencils

S □ × 6 =

5 Do the exercise.

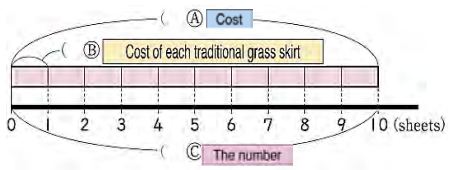
Sample Blackboard Plan

Date: Chapter: Mathematical Sentences Sub-chapter/Topic: Math sentence of Multiplication Lesson: 1 of 1

Task: Let's find the unknown in a multiplication sentence.

1 We bought 10 traditional grass skirts, and paid 500 kina. What is the cost of one traditional grass skirt ?

❶ Let's complete the diagram below by filling the ( ) with words.



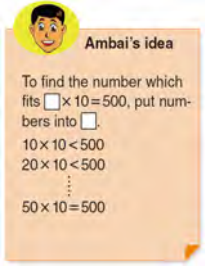
❷ Let's complete the mathematical sentence with words from the diagram.

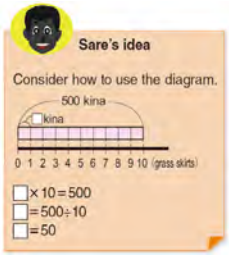
Number × Cost of each = Cost

❸ Let's represent the unknown number in mathematical sentence by using □.

10 × ? = 500

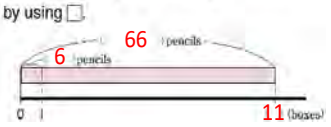
❹ Let's think about how to find the number in the □.





2 You divide 66 pencils into 6 pencils to each box. How many boxes of 6 pencils can you fill?

❶ Let's draw the diagram by representing the unknown number by using □.



❷ Let's make mathematical sentences with words and by using □.

11 × Number of pencils in each box = 66

11 × 6 = 66

❸ Let's find the number which fits the □ by using various ways.

Exercise

(Refer to TM for Question and Answers)

MT

Summary

Unit 18

Unit: Math Sentences Using the □
Sub-unit: Exercise and Evaluation
Lesson 1 of 1 (Double Period)

Textbook Page : p.192
Actual Lesson 133

Sub-unit Objectives

- To deepen the understanding what they learned in the unit.
- To master the skill for solving problems of math sentence using □.

Lesson Objectives

- To deepen the understanding what they learned in the unit.
- To master the skills for solving problems of math sentence using □.

Prior Knowledge

- All the contents in this unit

Preparation

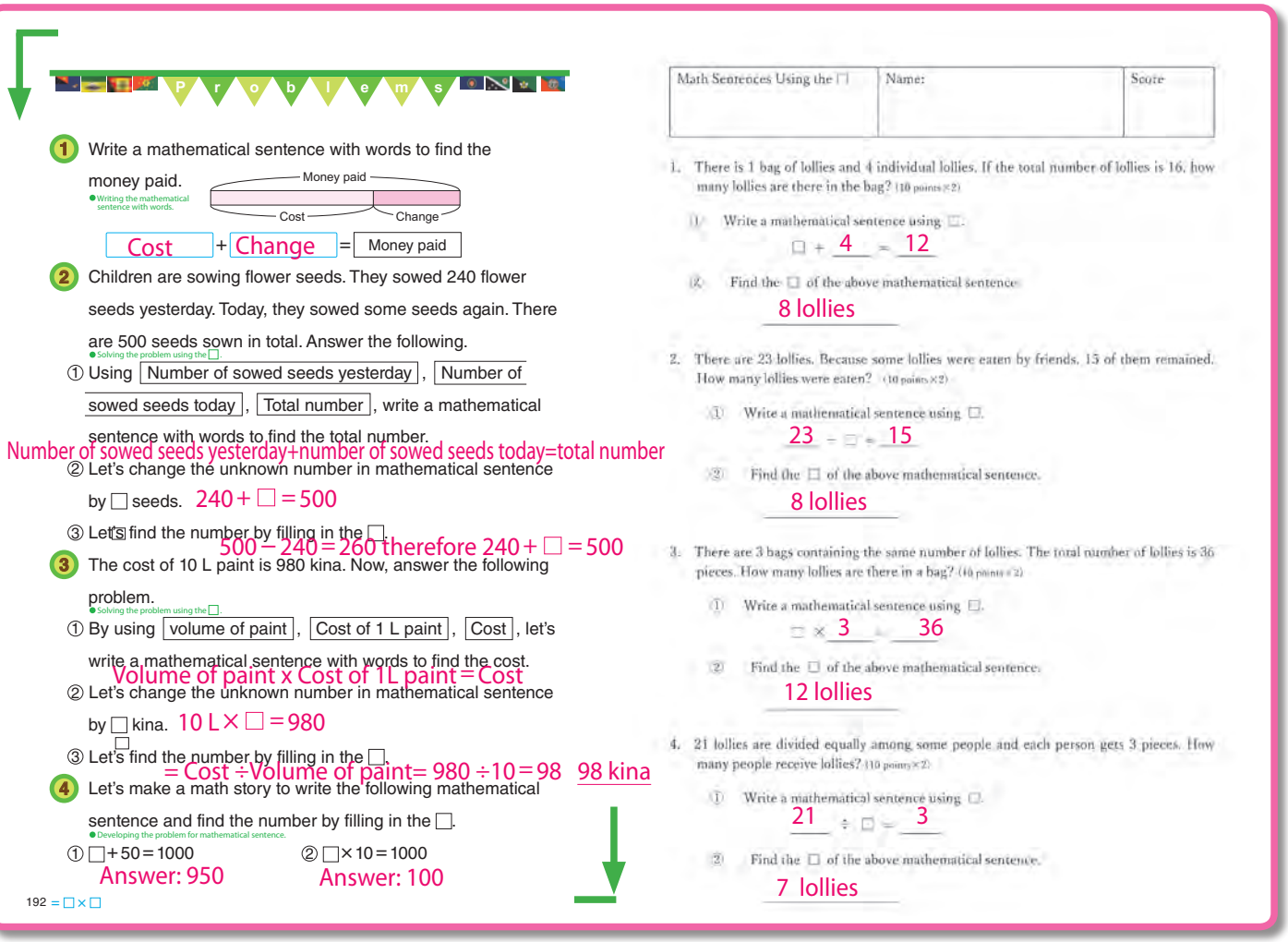
- Evaluation sheet for the students

Assessment

- Solve the problems correctly confirming what they learned in the unit. F S

• Teacher's Notes •

Use 30 minutes for the exercise and give the evaluation test after that.



Problems

1. Write a mathematical sentence with words to find the money paid.
   Writing the mathematical sentence with words.
   Money paid / Cost / Change
   Cost + Change = Money paid
2. Children are sowing flower seeds. They sowed 240 flower seeds yesterday. Today, they sowed some seeds again. There are 500 seeds sown in total. Answer the following.
   Solving the problem using the □.
   ① Using Number of sowed seeds yesterday, Number of sowed seeds today, Total number, write a mathematical sentence with words to find the total number.
   Number of sowed seeds yesterday+number of sowed seeds today=total number
   ② Let's change the unknown number in mathematical sentence by □ seeds. 240 + □ = 500
   ③ Let's find the number by filling in the □.
   500 − 240 = 260 therefore 240 + □ = 500
3. The cost of 10 L paint is 980 kina. Now, answer the following problem.
   Solving the problem using the □.
   ① By using volume of paint, Cost of 1 L paint, Cost, let's write a mathematical sentence with words to find the cost.
   Volume of paint x Cost of 1L paint = Cost
   ② Let's change the unknown number in mathematical sentence by □ kina. 10 L × □ = 980
   ③ Let's find the number by filling in the □.
   = Cost ÷ Volume of paint = 980 ÷ 10 = 98 98 kina
4. Let's make a math story to write the following mathematical sentence and find the number by filling in the □.
   Developing the problem for mathematical sentence.
   ① □ + 50 = 1000 Answer: 950
   ② □ × 10 = 1000 Answer: 100

192 = □ × □

Math Sentences Using the □ | Name: | Score

1. There is 1 bag of lollies and 4 individual lollies. If the total number of lollies is 16, how many lollies are there in the bag? (10 points × 2)
   ① Write a mathematical sentence using □.
   □ + 4 = 12
   ② Find the □ of the above mathematical sentence.
   8 lollies
2. There are 23 lollies. Because some lollies were eaten by friends, 15 of them remained. How many lollies were eaten? (10 points × 2)
   ① Write a mathematical sentence using □.
   23 − □ = 15
   ② Find the □ of the above mathematical sentence.
   8 lollies
3. There are 3 bags containing the same number of lollies. The total number of lollies is 36 pieces. How many lollies are there in a bag? (10 points × 2)
   ① Write a mathematical sentence using □.
   □ × 3 = 36
   ② Find the □ of the above mathematical sentence.
   12 lollies
4. 21 lollies are divided equally among some people and each person gets 3 pieces. How many people receive lollies? (10 points × 2)
   ① Write a mathematical sentence using □.
   21 ÷ □ = 3
   ② Find the □ of the above mathematical sentence.
   7 lollies

Lesson Flow

1 **① Make mathematical sentence by words.**

T Let students make mathematical sentence by filling the word in boxes.

2 **② Make mathematical sentence using □ for unknown number and find the number which can go in □.**

T ① Let's make mathematical sentence using words.
S Number of seeds sowed yesterday + Number of seeds sowed today = Total number
TN Let students draw tape diagram to understand mathematical relations.
TN ② ③Let students make mathematical sentence and find the answer.

3 **③ Make mathematical sentence using □ for unknown number and find the number which can go in □.**

T ① Let's make mathematical sentence using words.
S Volume of paint × Cost of 1 L paint = Total cost.
TN Let students draw tape diagram to understand mathematical relations.
TN ② ③Let students make mathematical sentence and find the answer.

4 **④ Make word problem for the mathematical sentence.**

TN Let students work individually or in pairs and assist the students who face difficulties.
T Let students share with friends and solve together.
S Write word problem.

End of Chapter Test: Chapter 18 **Date:**

Math Sentences Using the □	Name:	Score

1. There is 1 bag of lollies and 4 individual lollies. If the total number of lollies is 16, how many lollies are there in the bag? (10 points × 2)

   ① Write a mathematical sentence using □.

   □ + ____ = ____

   ② Find the □ of the above mathematical sentence.

   ____

2. There are 23 lollies. Because some lollies were eaten by friends, 15 of them remained. How many lollies were eaten? (10 points × 2)

   ① Write a mathematical sentence using □.

   ____ − □ = ____

   ② Find the □ of the above mathematical sentence.

   ____

3. There are 3 bags containing the same number of lollies. The total number of lollies is 36 pieces. How many lollies are there in a bag? (10 points × 2)

   ① Write a mathematical sentence using □.

   □ × ____ = ____

   ② Find the □ of the above mathematical sentence.

   ____

4. 21 lollies are divided equally among some people and each person gets 3 pieces. How many people receive lollies? (10 points × 2)

   ① Write a mathematical sentence using □.

   ____ ÷ □ = ____

   ② Find the □ of the above mathematical sentence.

   ____

Chapter 19 Using Money in Our Life

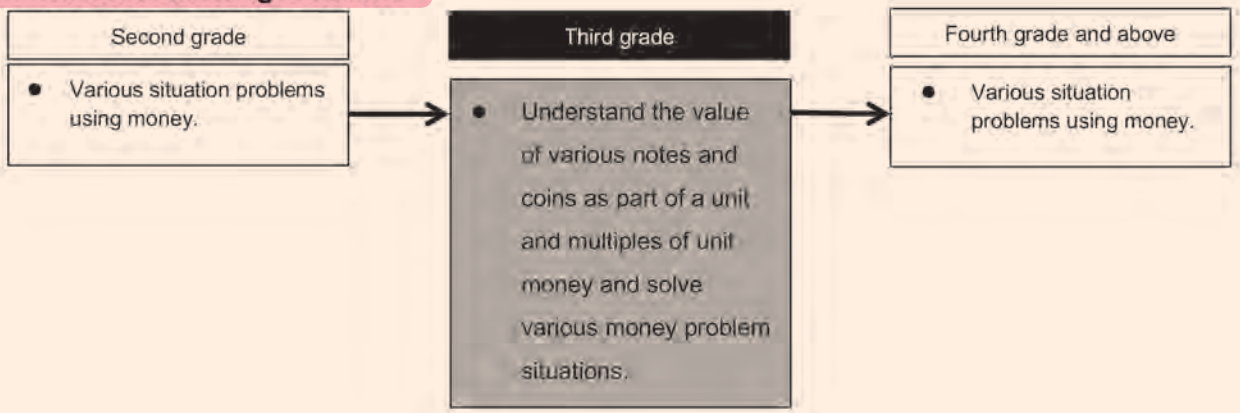
1. Unit Objectives

- Understand the value of various notes and coins as part of a unit and multiples of unit money.(3.2.4 a and c)
- Solve various money problem situations.(3.2.4 b, d and e)

2. Teaching Overview

In Papua New Guinea the currency for money is kina and toea. Everyone uses kina and toea for survival to sustain their daily needs and wants. In this unit, students will realise and understand the importance of the value of money in various notes and coins as part of a unit and further expressed in multiples of a unit money. It helps the students to appreciate and utilise money to solve many problems or situations daily with respect to their cultural heritage.

3. Related Learning Contents



Unit 19

Unit: Using Money in Our Life
Sub-unit: 1. Price and Coins
Lesson 1 of 2 (Double Period)

Textbook Page :
P.193-p.195
Actual Lesson 134

Sub-unit Objectives

- Explain the value of one Kina coin by using various other coins.
- Compare various prices of items.
- Solve various situation problems.

Prior Knowledge

- 4 basic mathematics operations.
- Basic knowledge about money(Elementary)

Lesson Objectives

- Represent the value of one Kina coin by using various other coins.
- Compare various prices of items.
- Solve various situation problems using 4 basic mathematics operations.

Preparation

- Picture of coins, real coins(if possible)

Assessment

- Enjoy thinking about various situation of using money. F
- Solve various problems considering different ways. S

• Teacher's Notes •

When introducing PNG coins, explain to students that our coins value begins with 5 toea. That 5 toea has its value to buy and sell goods.

19 Using Money in Our Life

Let's ask questions with friends.

1 Price and Coins

1 Price and Coins

How to read the prices using kina and toea.

Let's read the following prices.

1 kina is written as K1.00 for the price. The price K3.95 is read as three-kina and ninety-five toea. The price 50 t is read just 50 toea. 1 kina is equal to 100 toea. Therefore, 3.95 kina is equal to 395 toea.

How to read the prices.

2 Let's read orally and fill in the box.

① The price of one small coffee packet is 50t. It is [50] toea.
It is one 50 toea coin. It is [2] coins of 20 toea and [1] coin of 10 toea.
The price of two mini coffee packets is [100] toea.
It is 1 kina.

② The price of a bottle of water is K1.50. It is [150] toea.

③ The price of a dozen for pencils is K3.99. It is [399] toea.

Exercise

Read the following price and arrange them in order.

① Ice cream K2.00, Apple K1.50, Orange K2.60,
Chocolate K1.99 and Juice K2.95.

1. Arrange them from the highest price to the lowest.
Juice, Orange, Ice cream, Chocolate and Apple
2. Arrange them from the lowest price to the highest.
Apple, Chocolate, Ice cream, Orange and Juice

② Arrange the following from lowest price.
Lolly 30 toea, Milk 2 kina, Chocolate 95 toea,
Snack 1 kina and Bubble Gum 5 toea.
Gum, Lolly, Chocolate, Snack, Milk

Papua New Guinea Coins

There are 5 types of coins in Papua New Guinea. Discuss what kind of characteristics each coin has.
Example: 1 kina coin has a hole. The size is getting bigger while the value increases.

□ − □ = 193 194 = □ + □

Lesson Flow

1 ① Read the price of various materials.

T Introduce the main task.
S Read the prices shown in the texbook.
T Confirm especially how to read K15.95 and K3.99
T Ask students the meaning of 15 and 95.
S 15 means 15 kina and 95 means 95 toea.
T Read and explain ＿＿＿＿＿＿.

2 ② Solve the problems.

S Solve activities ① ② ③
T Confirm that 1 kina is equal to 100 toea

3 Complete the excercise.

S Complete (1). (2) can be given as homework.

4 ③ Solve the problem.

S ① Explain and understand 4 ideas in the textbook.
S ② Discuss which idea students prefer and the reason why.
S Understand there are various conbination of coins to make certain toea.
T/S Summarise the important point in the box ＿＿＿＿＿＿.

Sample Blackboard Plan

Due to limited space, Sample blackboard plan is placed on page 305.

Which Coin Do you use

3 James saved his money in the box for one year. Now, he has a number of every coin in his box and goes shopping.
① For paying a small coffee packet of 50 toea, which coins should he use for paying and explain why?
② Whose idea do you prefer?

Gawi's idea
Count by five
5, 10, 15, 20, 25, 30, 35, 40, 45, 50
10 coins of 5 toea

Ambai's idea
□ coins of 10 toea are 5×10
10 20 30 40 50 toea

Mero's idea
If we only use 20 toea coins, I use 3 coins of 20 toea and receive the change by 10 toea.
3×20=60

Yamo's idea
If I pay by a 1 kina coin,50 toea subtract from 1 kina.
The change is 50 toea.
It is 2 coins of 20 toea and a 10 toea coin.

Vavi's idea
□ coins of 5 toeas are 10×5.

Which operation do you prefer?

To know the value of a number of the same currency, we use multiplication such as: 20 coins of five toea is 20×5=100 toea.
Its value is 1 kina. Five toea coin used as a unit for counting.
(Number of the Coin)×(Value of the Coin)=(Total Value)

For using coins, we use the several conversions such as:
2 coins of 5 toea convert to a 10 toea coin.
4 coins of 5 toea convert to a 20 toea coin.
20 coins of 5 toea convert to a 1 kina coin.

How Much in Total

4 At a market, you find the prices in the table below.
① Fill in the table.
② When you buy a bottle of water and a coffee packet each, how much in total?

Item	Price	In Kina	In Toea
Bottle of water	K1.50	1.5 kina	
Coffee Packet	K0.50		
Dozen Pencil	K3.99		

1.50+0.50?
How can we add?

K1.5 means 1 kina and 50 toea and 0.50 kina means 50 toea, right?

□×□=195　196=□×□

Unit 19

Unit: Using Money in Our Life
Sub-unit: 1. Price and Coins
Lesson 2 of 2 (Double Period)

Textbook Page : p.196 - p.198
Actual Lesson 135

Lesson Objectives

- To understand how to add the prices.
- To understand the relationship among price, given money and change.

Prior Knowledge

- Types of coins
- Combination of coins to make certain amount.

Preparation

- Picture of coins.

Assessment

- Think about how to find the total price by adding. F
- Think about the relationship among price, given money and change. F
- Enjoy solving various tasks correctly. F S

• Teacher's Notes •

Students may wonder about the price that have 99 toea but cannot give the change of it. In this case explain to them that 1 toea does not have value in our money system.

To know the value of a number of the same currency, we use multiplication such as: 20 coins of five toea is 20 × 5 = 100 toea.
Its value is 1 kina. Five toea coin used as a unit for counting.
(Number of the Coin) × (Value of the Coin) = (Total Value)

For using coins, we use the several conversions such as:
2 coins of 5 toea convert to a 10 toea coin.
4 coins of 5 toea convert to a 20 toea coin.
20 coins of 5 toea convert to a 1 kina coin.

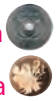
How Much in Total

Find the total price of more than 2 materials.

4 At a market, you find the prices in the table below.

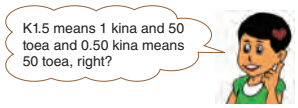
1. Fill in the table.
2. When you buy a bottle of water and a coffee packet each, how much in total?

Item	Price	In Kina	In Toea
Bottle of water	K1.50	1.5 kina	150 toea
Coffee Packet	K0.50	0.5 kina	50 toea
Dozen Pencil	K3.99	3.99 kina	399 toea



1.50 + 0.50?

How can we add?



Kekeni's idea

I calculated using vertical form.

1.5 + 0.5 = 2

$$\begin{array}{r} 1.5 \\ +\ 0.5 \\ \hline 2.0 \end{array}$$

2 kina

Gawi's idea

If we represent them in toea:
K 1.5 is 150 toea
K 0.5 is 50 toea

$$\begin{array}{r} 1\,5\,0 \\ +\ \ 5\,0 \\ \hline 2\,0\,0 \end{array}$$

200 toea is 2 kina.

5 In 4, when you buy all three items, how much in total?

1. Let's find the total price in vertical form.
2. Which coins should you use and how much will be the change?

Six 1- kina coins

For using calculator, we write as follows.

$$\begin{array}{r} {}^{K}1.5\,0\,{}^{t} \\ 0.5\,0 \\ +\ 3.9\,9 \\ \hline \end{array}$$

How do you type it in your calculator?

In shopping, we write the price in vertical form and find the total price by calculator. For payment, we usually show the money as for the same value of total price or more at first. When it is the same value, there is no change. When it is more, we must receive the change, exactly.

To know the value of change we use subtraction:
(Given money) − (Price) = (Change)
For Confirmation: **(Price) + (Change) = (Given money)**

196 = □ × □

□ + □ = 197

Lesson Flow

1 4 Read and understand the given situtation.

S ❶ Think about the given situation and fill in the table.
T Confirm that 1 kina is equal to 100 Toea.
S ❷ Make a mathematical expression and think about how to calculate.
S Understand Kekeni and Gawi's idea.
T Introduce the main task.

2 5 Think about how to find the total price of the materials.

S ❶ Make a mathematical expression to find the total price of 3 items and solve in vertical form.
S Think about various conbination for K5.99.

6 How much in total? Write the prices in vertical form and find the answer. K8.09
Coke K2.00, Biscuit K1.50, Cream bun K2.60 and Chocolate K1.99.

7 I bought a bottle of water for 1.59 kina and I gave two coins of one kina, and received 3 coins of 20 toea as for change. Is it correct? Explain with reason.
2-1.59=.41
I should receive 2 coins of 20 toea.

In our country, some shops set the price which does not correspond to our money system. The price such as K0.99 cannot be paid by coins.

S 6 coins of 1 kina, 5 coins of 1 kina and 5 coins of 20 toea, and so on.

3 Understand the relationship among price, given money and change.

S Think about the relationship among price, given money and change.
T Explain the important point in the box .

4 6 Calculate the total price.

S Make a mathemathical expression and find the total price.

5 7 Think about the situation.

S Read the problem, make mathematical sentence and find the answer.
T How much is the change?
S 1 toea.
T Does 1 toea coin exist?
S No.
T Explain the important point in the box .

Sample Blackboard Plan

Date: Chapter 19: Money Topic: Price and Coins Lesson Number: 2 out of 2

Task: Let's think about how to find the total price of 2 items.

MT: Introduce main task here.

4 Let's write the prices using kina and toea.
❶ Fill in the table below.

Items	Price	In kina	In toea
1. Bottle of water	K1.50	1.5 kina	150 toea
2. Coffee Packet	K0.50	0.5 kina	50 toea
3. Dozen Pencil	K3.99	3.99 kina	399 toea

❷ Find how much in total for the 2 items.

1.50 + .50
How can we add?

(1) K1.50 means 1.5 kina or 1 kina and 50 toea
(2) K0.50 means 0.5 kina or 50 toea.

1. Bottle of water	K1.50	1.5 kina	150 toea
2. Coffee Packet	K0.50	0.5 kina	50 toea
Total	**K2.00**	**2.0 kina**	**200 toea**

5 ❶ Let's find the total price in vertical form.
(1) K1.50 + K0.50 + K3.99
(2) 1.5 kina + 0.5 kina + 3.99 kina
(3) 150 toea + 50 toea + 399 toea

1. Bottle of water	K1.50	1.5 kina	150 toea
2. Coffee Packet	K0.50	0.5 kina	50 toea
3. Dozen Pencil	K3.99	3.99 kina	399 toea
Total	**K5.99**	**5.99 kina**	**599 toea**

❷ Which coins shall you use and how much change?

6 × 1 = 6
Answer: K6.00

Take note that 1 toea is the change however it's outdated so no change

To know the value of change we use subtraction:
(Given money) − (Price) = (Change)
For Confirmation: (Price) + (Change) = (Given money)

Summary
- Prices of goods such as K3.99 where 1 toea coin is the change is outdated therefore no change.
- 1.5 kina is written as K1.50 and is equal to 150 toeas.
- For knowing the value of change, we use subtraction:

Given money - Price = Change
•For confirmation
Price + Change = Given money

Home work
1. Practice task 6 and 7

Unit 19

Unit: Using Money in Our Life
Sub-unit: 2. Unit for Currency
Lesson 1 of 2 (Single Period)

Textbook Page : p.199-p.200
Actual Lesson 136

Sub-unit Objectives

- To understand the types of notes for currency.
- To choose coins and notes to show simplest way to make certain amount.

Lesson Objectives

- To understand the types of notes for currency.
- To understand how to pay effectively by combining coins and notes.

Prior Knowledge

- Types of coins
- Combination of coins to make certain amount.

Preparation

- Picture of coins and notes

Assessment

- Think about how to pay effectively by combining notes and coins. F
- Appriciate the advantage of notes as currency. F

• Teacher's Notes •

In this lesson the students may be introduced to, the term currency for the first time. Help them to understand that currency defines the national money for a country. For PNG our unit of currency is kina and toea.

2 Unit for Currency

When we are not comfortable to pay by coins, we use notes as the currency. They are not heavy.

1 Price of one hand cream bottle is K5.50.

1 How many coins do we need for buying one bottle?

If 5 toea coin only: 110

If 10 toea coin only: 55

If 20 toea coin only: 28

If 1 kina coin only: 6

Which one will receive change? 1 kina coin

2 How much is the cost for 50 bottles? Can we pay by coins?

It is difficult to pay by coins only.

2 In 1, 1 if you use the following notes, below.

1 How would you pay and what will be the change?

Types of notes

A two-kina note is;
2 coins of 1 kina or
4 coins of 50 toea or
10 coins of 20 toea or
20 coins of 10 toea.
A five-kina note is; 5 coins of 1 kina, or 2 two-kina notes and one kina coin.
A five-kina note is 10 coins of 50 toea.
A ten-kina note is 10 coins of 1 kina coin.
A ten-kina note is 20 coins of 50 t or 2 notes of five-kina, or five notes of two-kina .

Naiko's idea

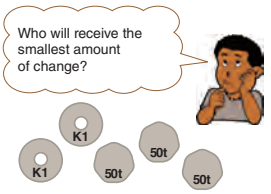
I only use two-kina notes as follows:
Two, four, six. 5.5 is larger than 4 and less than 6. Thus, pay 6 kina by three of two-kina note.
6 − 5.5 = 0.5
0.5 kina is fifty toea.

Yamo's idea

I use a ten-kina note because it is larger than 5.5 kina. The change is 10 − 5.5 = 4.5.
4.5 kina is 4 kina and 50 toea.
It is 2 two-kina notes and one coin of 50 toea.

Sare's idea

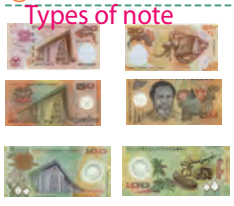
I use a 5-kina note and 2-kina note. The change is
7 − 5.5 = 1.5
1.5 kina is 1 kina and 50 toea.
It is one coin of one kina and 50 toea.



2 In 1 2, if you use the notes, how would you pay and what will be the change? Three 100 kina notes, change 20 kina and 5 kina notes.

Have you ever seen the following notes

Types of note



A twenty-kina note is 20 coins of 1 kina,or 2 notes of ten-kina, or 4 notes of five-kina, or 10 notes of two-kina.
A fifty-kina note is 2 notes of twenty-kina and a ten-kina note.
A hundred-kina note is 100 coins of 1 kina, or 5 notes of twenty-kina, or 10 notes of ten-kina, or 20 notes of five-kina, or 50 notes of two-kina.

□ − □ = 199 200 = □ × □

Lesson Flow

1 ① Think about how many coins are used for K5.50.

T Introduce the main task.

S ① Think about how many coins are needed to pay K5.50.

S ② ③ Realise that it is diffcult to pay by coins only when the amount increase.

2 ② Think about how to pay K5.50 by using coins and notes.

T Explain the types of notes in the box

S Think about how to pay K5.50 using notes.

S Share their idea with their friends.

3 Think about Naiko, Yamo and Sare's ideas.

TN Naiko's idea

He uses three 2 kina note and receives 0.5 kina change.

Yamo's idea

She uses a 10 kina note and receives 4.5 kina change.

Sare's idea

He uses a 5 kina note and 2 kina note and receives 1.5 kina change.

T Summarise that there are various ways of paying by using notes.

4 ② Think about how to pay 50 bottles of hand cream with notes.

S Use three 100 kina notes and receive a 20 kina and 5 kina notes as change.

S I use two 100 kina notes, one 50 kina note and three 10 kina notes and I receive one 5 kina note as change.

Sample Blackboard Plan (Lesson 134)

Date: Chapter 19: Money Topic: Price and Coins Lesson Number: 1 out of 2

Main Task: Let's think about how to read and represent the prices.

MT

1 Let's read the prices

1 kina

50 toea

15 kina, 95 toea

3 kina , 99 toea

2 Let's fill in the box.

1 50t is ☐ toea.

One 50 toea coin is made up of ☐ 20 toea coins and ☐ 10 toea coin.

Two mini coffee packet is ☐ toea.

2 K1.50 is ☐ toea.

3 K3.99 is ☐ toea.

Exercise

① Let's arrange the prices from the highest to the lowest amount.

1. K2.95 Juice
2. K2.60 Orange
3. K2.00 Ice cream
4. K1.90 Chocolate
5. K1.50 Apple

② Here arrange from the lowest price to the highest price.

1. 5 toea	→ Bubble Gum
2. 30 toea	→ Lolly
3.95 toea	→ Chocolate
4. 1 kina	→ Snack
5. K 2.00	→ Milk

3 ① Pay using a 50t coin if any in the purse or wallet.
1.It is the exact amount.
2.There is no need to worry about change.

② Ambai's idea preferred.
1. Reducing the number of coins in the purse.
2.Know the value of a 10t coin and multiply by 5 to give a total value of 50t.

Important Point

- To give the amount of the total value, know the value of a coin and multiply by a number coins of the same value.

(Number of the Coin) × (Value of the Coin) = (Total Value)

Summary

- In our daily life, when using coins , we normally use several conversions such as : 2 coins of 5t is converted to 10t, 4 coins of 5t is 20t and 20 coins of 5t is 1 kina.
- 1 kina is written as K1.00 and is equal to 100 toeas.
- To give the amount of the total value, know the value of a coin and multiply by a number coins of the same value.

Sample Blackboard Plan (Lesson 136)

Date: Chapter 19: Money Topic: Unit for Currency Lesson Number: 1 out of 2

Task: Let's think about how to pay the price for an item.

MT

1 Let's pay the price of K5.50

① How many coins do we need?

5 toea coin only	110
10 toea coin only	55
20 toea coin only	23
1 kina coin only	6

Which of these coins receives change?

20 toea and 1 kina

② Cost for all bottles. Can we pay by coins?

50 × 5.50 = 27.50

Answer: It is difficult to pay by coins only.

Important Point

A two kina note is 2 coins of 1 kina coin.
A two kina note is 4 coins of 50 toea.
A two kina note is 10 coins of 20 toea.
A two kina note is 20 coins of 5 toea.

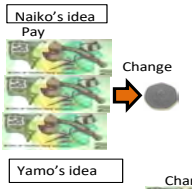
A ten-kina note is 10 coins of 1 kina coin.
A ten-kina note is five notes of 2kina or 2 notes of five kina

A five-kina note is 5 coins of 1 kina coin.
Two 2 kina notes and one 1 kina coin.
A five kina note is 10 coins of 50 toea

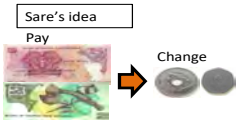
② Let's think about how to pay for one hand cream bottle?

① If I use notes, how do I pay for one hand cream bottle?

Naiko's idea



Sare's idea



Yamo's idea

Take note that students relate these with how to calculate.

② Who receives the smallest amount of change?

Answer: Naiko

Important Point

A twenty- kina note is 20 coins of 1 kina or 2 notes of ten-kina or 4 notes of five kina, or 10 notes of two-kina.

A fifty-kina note is 2 notes of twenty kina and a ten-kina note.

A hundred-kina note is 100 coins of 1kina or 5 notes of twenty-kina or 10 notes of ten-kina or 20 notes of five kina or 50 notes of two-kina.

Homework

If I use notes, how do I pay for all bottles in the dotted lines?

Summary

- To give the amount of the total value, know the value of a notes and coin s and multiply by a number notes and coins of the same value.
- It is easy to pay for all bottles in the dotted lines using notes.

Unit 19

Unit: Using Money in Our Life
Sub-unit: 2. Unit for Currency
Lesson 2 of 2 (Single Period)

Textbook Page : p.201-p.202
Actual Lesson 137

Lesson Objectives

- To solve various problems about converting coins to notes or vice versa.
- To calculate changes when using different notes for payment.

Prior Knowledge

- Types of coins and notes
- Combination of coins and notes to make certain amount of money.

Preparation

- Blocks,

Assessment

- Think about how to make payment effectively when you buy something. F S

• Teacher's Notes •

Help the students to understand that there are different ways we can combine notes to buy certain goods and services.

3 Fill in number in the boxes.

1. A two-kina note converts to [10] coins of 20 toea.
2. A fifty-kina note is 2 notes of twenty-kina and [1] note of ten-kina.
3. 50 kina is [1] note of twenty-kina and [60] notes of five-kina.
4. 84 kina is a fifty-kina note, a [20] -kina note, a [10] -kina note and two notes of two-kina.

4 When you buy one of the items in the photo below, how much is the change?

1. When you have a 100 kina note.
   A: 100-25=75 Answer: 75 kina change
   B: 100-20=80 Answer:80kina change
   C: 100-39=61 Answer: 61 kina change
2. When you have 2 notes of 20 kina, 3 notes of 10 kina and 3 notes of 2 kina.
   20+10-25=5 5kina change
   20-20=0 No change

Exercise

Solve the following mathematics expression.

① 1.5 kina + 2.5 kina 4 kina ② 2 kina + 50 toea 2kina 50toea

③ 50 toea + 90 toea ④ 2.5 kina + 50 toea

1kina 40 toea or 140 toea 3 kina or 300 toea

□ + □ = 201 202 = □ × □

Price Survey Project at Local Market

Prices of selling food at the local market changes depending on time in a day, season, and seller and so on. For price down, we do some negotiation.
Visit your local market with your parents and learn the price.

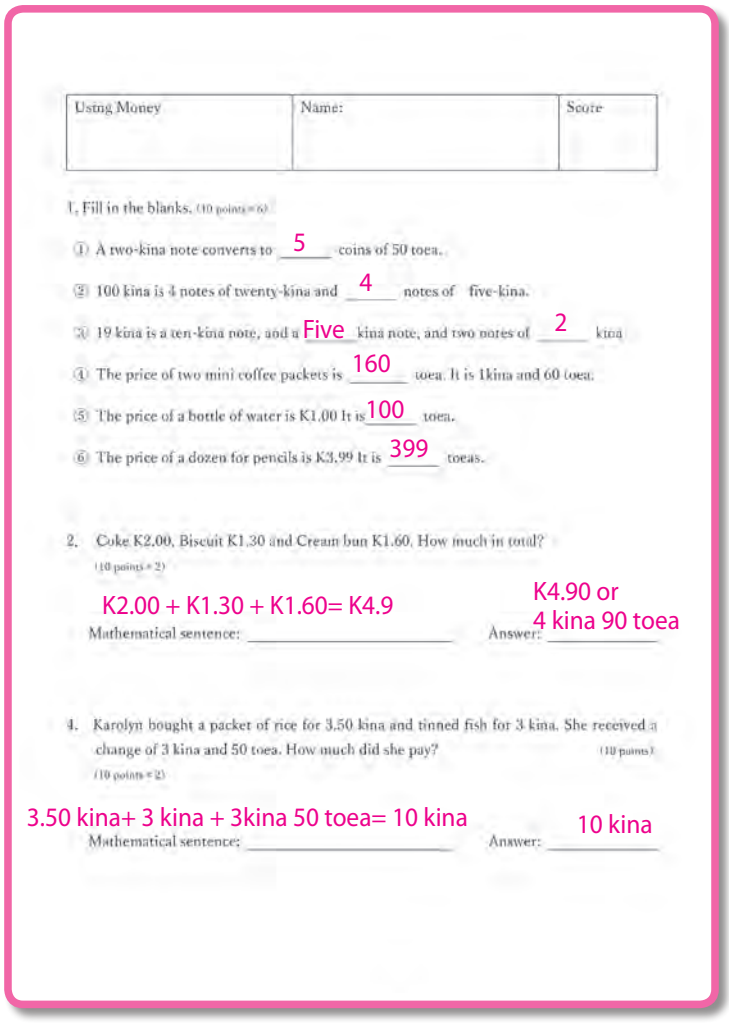
Name of foods	Price	Location

① Write the price of every food on the table in your local market and report it in the class.

② Choose the best survey in ① and develop shopping-calculation questions for using notes and coins and write it on a big chart to show it to your friends.

③ Present the questions and select the interesting questions as for the shopping.

Lesson Flow



Using Money | Name: | Score

1. Fill in the blanks. (10 points × 6)

① A two-kina note converts to 5 coins of 50 toea.

② 100 kina is 4 notes of twenty-kina and 4 notes of five-kina.

③ 19 kina is a ten-kina note, and a Five kina note, and two notes of 2 kina

④ The price of two mini coffee packets is 160 toea. It is 1kina and 60 toea.

⑤ The price of a bottle of water is K1.00 It is 100 toea.

⑥ The price of a dozen for pencils is K3.99 It is 399 toeas.

2. Coke K2.00, Biscuit K1.30 and Cream bun K1.60. How much in total? (10 points × 2)

K2.00 + K1.30 + K1.60= K4.9

Mathematical sentence: _____ Answer: K4.90 or 4 kina 90 toea

4. Karolyn bought a packet of rice for 3.50 kina and tinned fish for 3 kina. She received a change of 3 kina and 50 toea. How much did she pay? (10 points) (10 points × 2)

3.50 kina+ 3 kina + 3kina 50 toea= 10 kina

Mathematical sentence: _____ Answer: 10 kina

1 ③ Convert coins to notes or vice versa thinking about value of currency.

T Introduce the main task.

T Confirm types of coins and notes in Papua New Guinea and also confirm that 1 kina is equal to 100 toea.

S Solve the exercises individually and confirm the answers together for ①-④.

2 ④ Think about how to use notes for paying effectively.

S ① Calculate the change in terms of 3 materials.

A: 100 − 25 = 75 Answer: 75 kina change

B: 100 − 20 = 80 Answer:80 kina change

C: 100 − 39 = 61 Answer: 61 kina change

T ② Ask students to think various ways of paying.

S Write their idea in their exercise book.

S Share the ideas:

Examples: - When I pay for A, I use 20 kina note and 3 of 2 kina note, and I'll receive 1 kina coin as the change.

- When I buy C, I use one 20 kina note and one 10 kina note and I'll receive 1 kina coin as the change.

3 Complete the exercise.

S Complete 1 - 4.

Sample Blackboard Plan

Date: Chapter 19: Money Topic: Unit for Currency Lesson Number: 2 out of 2

Task: Let's review our understanding on notes and coins.

MT: Introduce main task here.

③ Let's review our understanding about money.

①  two kina

 10

②  fifty kina

 1

③  50 kina

 6 notes 1 note

④ 84 kina

 20 kina 10 kina

④ How much is the change when you buy one item?

① 1. 100 – 25 =75 Answer: 75 kina

2. 100 – 20 =80 Answer: 80 kina

3. 100 – 39 =61 Answer: 61 kina

4. 100 – 89 =11 Answer: 11 kina

② 1. 26 – 25 =1 Answer: 1 kina

2. 20 – 20 =0 Ans: No change

3. 40 – 39 =1 Answer: 1 kina

4. 86 – 85 =1 Answer: 1 kina

K89.00 means 89 kina

Summary

- Use easier way through mental calculation:

1.To find the total value of goods.

2. To find the change of items bought with a given amount.

- If you were given a certain amount to spend on 2 items for example K100, combine the prices of 2 possible items that may add up to K100.

Exercise

① 1.5 kina + 2.5 kina ② 2 kina + 50 toea

③ 50toea + 90 toea ④ 1.5 kina + 50 toea

End of Chapter Test: Chapter 19 **Date:**

Using Money	Name:	Score

1. Fill in the blanks. (10 points × 6)

① A two-kina note converts to _____ coins of 50 toea.

② 100 kina is 4 notes of twenty-kina and _____ notes of five-kina.

③ 19 kina is a ten-kina note, and a _____kina note, and two notes of _____ kina

④ The price of two mini coffee packets is _____ toea. It is 1kina and 60 toea.

⑤ The price of a bottle of water is K1.00 It is_____ toea.

⑥ The price of a dozen for pencils is K3.99 It is _____ toeas.

2. Coke K2.00, Biscuit K1.30 and Cream bun K1.60. How much in total?
(10 points × 2)

Mathematical sentence: _____ Answer: _____

4. Karolyn bought a packet of rice for 3.50 kina and tinned fish for 3 kina. She received a change of 3 kina and 50 toea. How much did she pay? (10 points)
(10 points × 2)

Mathematical sentence: _____ Answer: _____

Chapter 20 Summary of the Grade 3

This chapter is a summary of all the contents in Grade 3.
It is important for the students to acquire a procedural fluency in mathematics. That is not just understanding facts or procedures but using various procedures depending on the situation.
Various problems learnt in Grade 3 are included in this chapter, so please give sufficient time to students to solve all the problems.

Unit 20

Unit: Summary of Grade 3

Lesson 1 of 4 (Single Period)

Textbook Page : p.203~p.204
Actual Lesson 138

Sub-unit Objectives

- To review and confirm what students learned in Grade 3.

Lesson Objectives

- To review and confirm about number and calculation in Grade 3.

Prior Knowledge

- Number and calculation (Grade 2 and 3)

Preparation

- Place value chart of fraction and decimal number.

Assessment

- Solve the problems remembering what they learned in Grade 3. F
- Solve the exercise correctly. S

20 Summary of Grade 3

1 Numbers and Calculations

1 Fill in the ☐ with a number or numeral. ⑨⑫⑯

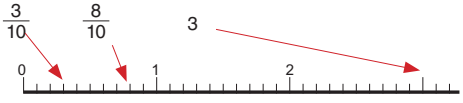
① The numeral in the hundred thousand place of 580000 is [5].

② 10 times 4300 equals [43000] and divide 4300 by 10 equals [430].

③ 4 sets of $\frac{1}{7}$ is [$\frac{4}{7}$].

2 Let's represent the following numbers by ↓ on the number line. ⑫⑯

Express the numbers on number line



3 Let's fill in the ☐ with the equality or inequality sign. ⑨⑫⑯

① 32419 [<] 319972 ② 301201 [>] 300498

③ $\frac{2}{7}$ [<] $\frac{6}{7}$ ④ $\frac{3}{5}$ [>] $\frac{2}{5}$

4 Let's calculate. ①⑥⑦⑫⑭⑯

① 7584+6439 14023 ② 8204−3427 4777 ③ 8125+650+350 9125

④ 30×70 2100 ⑤ 67×48 3216 ⑥ 870×32 27840 ⑦ 508×50 25400

□+□=203 204=□×□

⑧ 24÷3 8 ⑨ 56÷8 7 ⑩ 44÷7 6r2 ⑪ 39÷5 7r4

⑫ $\frac{1}{7}+\frac{2}{7}$ $\frac{3}{7}$ ⑬ $\frac{2}{3}-\frac{1}{3}$ $\frac{1}{3}$ ⑭ $\frac{1}{5}+\frac{3}{5}$ $\frac{4}{5}$ ⑮ $\frac{7}{9}-\frac{2}{9}$ $\frac{7}{9}$

5 There are 24 children who are going to receive 15 sheets of coloured paper each, how many sheets of coloured paper are needed? ⑭

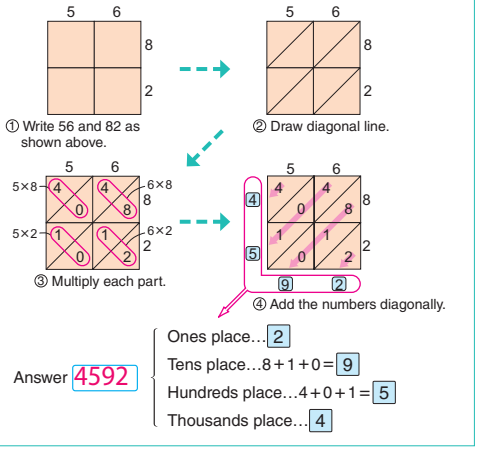
15 × 24=360 A. 360 sheets

6 Express the following problem using a multiplication with ☐ and find the answer. ⑰

☐ × 8 =64, ☐ =64 ÷ 8, ☐ =8

There are 64 mangoes that are divided equally into 8 boxes. How many mangoes can be put in each box?

Multiplication Using Squares 56 × 82



Answer [4592]

Ones place…[2]
Tens place…8+1+0=[9]
Hundreds place…4+0+1=[5]
Thousands place…[4]

Lesson Flow

1 ① Summarise the structure of whole number, decimal number and fraction.

T Introduce the summary unit.

TN Decimal number and fraction can show the remaining part of whole number.The difference between decimal number and fraction is that decimal number divides 1 into 10 but fraction divides 1 into the number of denominator.

S Solve the task.

2 ② Express the numbers on the number line.

T What is the scale unit of the number line?

S 0.1 or $\frac{1}{10}$

TN Confirm that 0.1 is equal to $\frac{1}{10}$.

S Solve the task.

3 ③ Compare the numbers.

T When comparing numbers, from which place value do we have to compare, larger or smaller?

S Larger place value.

T When it is difficult to compare, use number line to compare.

S Solve the task.

4 ④ Calculate whole numbers, decimal numbers and fraction.

S Calculate the operations correctly.

5 ⑤ Solve the word problem.

S Read and understand the problem.

TN Let students understand the situation and meaning of each number correctly.

T What operation can we use?

S Multiplication

T Ask students to make a math expression.

S 15×24

S Solve the expression.

6 ⑥ Solve the problem and make an expression with □.

S Read the problem.

T What does the □ represent?

S The number of mangoes in each box.

T What will be the mathematical sentence?

S $\square \times 8 = 64$

T Ask students to fill in □.

TN Ask students to read the 'Multiplication square' as a homework.

Sample Blackboard Plan

Date: Chapter 20: Summary of Gr 3 Topic: Summary of Grade 3 Lesson Number: 1 out of 4

Main Task: Let's think about how to calculate and solve.

MT: Introduce main task here.

① Numbers and Calculations

1 Let's fill the ☐ with a number or numeral.

1. 580000 is ☐
2. 10 times 4300 is ☐
3. Divide 4300 by 10 equals ☐
4. 4 sets of $\frac{1}{7}$ is ☐

2 Let's express numbers on the number line.

3 Let's fill the ☐ with equality and inequality signs.

1. 32419 < 319972
2. 301201 > 300498
3. $\frac{2}{7} < \frac{6}{7}$
4. $\frac{3}{5} > \frac{2}{5}$

4 Let's calculate.

1. 7584 + 6439
2. 8204 –3427
3. 8125 + 650 + 350
4. 30 × 70
5. 67 × 48
6. 870 ×32
7. 508 ×50
8. 24 ÷ 3
9. 56 ÷ 8
10. 44 ÷ 7
11. 39 ÷ 7
12. $\frac{1}{7}+\frac{2}{7}$
13. $\frac{2}{3}+\frac{1}{3}$
14. $\frac{1}{5}+\frac{3}{5}$
15. $\frac{7}{9}+\frac{2}{9}$

5 Let's think about how many sheets of coloured paper are needed?

1. Children : 24
2. Coloured sheets to be received by each child: 15
3. How many needed? unknown

Math Expression
24 × 15
Math Sentence
24 × 15 = 360

$$\begin{array}{r} 24 \\ \times\ 15 \\ \hline 120 \\ 24 \\ \hline 360 \end{array}$$

Answer: 360 sheets of coloured paper

6 Let's think about how to express the problem using a multiplication with ☐ and find answer.

Math Sentence
8 × ☐ = 64

$8 \times \square = 64$
$8 \times x = 64$
$8x = 64$
$\frac{8x}{8} = \frac{64}{8}$
$x = 8$

Answer: 8 mangoes are put in each box.

Exercise

1. Try out the 'multiplication squares' as homework.

Unit 20

Unit: Summary of Grade 3

Lesson 2 of 4 (Single Period)

Textbook Page : p.205-p.206
Actual Lesson 139

Lesson Objectives

- To review and confirm quantity and measurement in Grade 3.

Prior Knowledge

- Measurement in grade 3
- Geometry in grade 3

Preparation

- Prepare according to the black board plan.

Assessment

- Solve the problems remembering what they learned in Grade 3. F
- Solve the exercise correctly. S

2 How to Measure

1 Let's fill in the ☐ with a number. 4 10 15

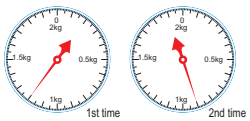
1. 1 km = 1000 m
2. 2450 m = 2 km 450 m
3. 1 minute = 60 seconds
4. 1 kg = 1000 g
5. 148 seconds = 2 minute 28 seconds
6. 3040 g = 3 kg 40 g

2 Let's find the duration of time. 4

1. What is the duration from 7:40 to 11:00 in the morning? 11:00-7:40=3 hours 20 minutes
2. What is the time that is 1 hour and 30 minutes after 10:20 in the morning? 10:20 + 1:30 = 11:50
3. I enjoyed myself at the park for 1 hour and 10 minutes in the morning and later enjoyed 30 minutes in the afternoon. Let's find the total time I enjoyed and the difference. 15
   1hour 10 minutes + 30 minutes = 1 hour 40 minutes
   1hour 10 minutes − 30 minutes = 40 minutes

3 Measure the weight of two oranges.

What is the weight altogether?



1kg200g + 900g = 2kg 100g

Measure the Weight of an Elephant

In the old days, how did they measure the weight of an elephant?

Firstly, they put an elephant in the boat and drew a line to show how far the boat went down in the water.

Next, they put stones in the boat until it went down to the line. Then they measured the weight of stones to calculate the total weight.

3 Shape

1 What kind of shapes are the following figures? Name of circle, sphere and traingle 9 11

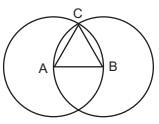
1. A round figure that is the same length from one point. Circle
2. An object that looks a circle from any direction and like a ball. Sphere
3. A triangle with three equal sides. Equilateral triangle
4. A triangle with two equal sides. Isosceles triangle

2 Let's draw the following triangles. What kind of triangles is drawn? 11

1. A triangle where 3 sides are 8 cm, 5 cm and 8 cm. Isosceles triangle
2. A triangle where 3 sides are 9 cm, 9 cm and 9 cm. Equilateral triangle

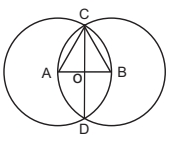
3 Let's draw two circle with a radius 4 cm and the centre points A and B. 8 11

1. What kind of triangles is a triangle ABC? Equilateral triangle
2. How many centimetres are the sides of a triangle ABC? 4 cm



How to Make a Right Angle

Draw the line CD, and measure the angle COB. This is the way to draw the right angle. Let's apply this method using a rope for drawing a right angle on the land.



☐ × ☐ = 205 206 = ☐ × ☐

Lesson Flow

1 ① Review the relationship of basic units.

TN 1 km = 1000 m, 1 minute = 60 seconds, 1 kg = 1000 g

S Solve the task.

2 ② Calculate time and duration.

TN There are many students who have difficulty of calculation of time and duration. When it is difficult, use number line to think about and solve the exercise.

S Solve the task.

3 ③ Think about how to find the ☐.

TN Confirm how many kg is the smallest unit.

T How many kg does the smallest unit express?

S 0.01 kg.

T 0.01 kg is how many g?

S 10 g.

T The left side scale shows how many kg and g?

S 1 kg and 1 kg 200 g.

T The right side scale shows how many g?

S 900g.

T What is the total?

S 1 kg 200 g + 900 g = 2 kg 100 g.

4 ① Name the shape described.

TN Review the characteristics of circle, sphere, isosceles triangle and equilateral triangle

S Solve the task.

5 ② Draw various triangles using compass and ruler.

T Confirm the steps to draw a triangle.

TN In case many students have difficulty go back to the related page of the text book and confirm the steps accordingly.

S Solve activity ① and ②.

6 ③ Draw the figure and answer the question.

TN When drawing figures confirm that an arc of a circle goes through a centre of the other circle.

S Solve the activity ① and ②

T Confirm the meaning of radius in question ②.

Sample Blackboard Plan

Date: Chapter 20: Summary of Gr 3 Topic: Summary of Grade 3 Lesson Number: 2 out of 4

MT: Introduce main task here.

Main Task: Let's think about how to calculate and solve.

② How to measure

① Let's fill the ☐ with a number or numeral.

① 1km ☐ = m ② 2450 m = ☐km ☐m

③ 1 minute = ☐ seconds ④ 1kg = ☐g

⑤ 148 seconds = ☐minute ☐seconds

⑥ 3040 = ☐kg ☐g

② Let's find the duration of time.

① 8:00 to 11:00 is 3 hours; 7 8 9 10 11 12 o' clock; 7:40; 11:00; 20 mins more is 8:00

Answer : 3 hours and 20 minutes

② Let's find out about the time.

10:20 to 11:20 is 1 hour; 30 mins more is 11:50; 10 11 12; 1 hour 30 mins; 10:20; 11:50

③ Let's find the total time enjoyed.

Morning 1hour 30 mins
Afternoon 30mins

Total time

hr	m
1	10
+ 1	30
1	40

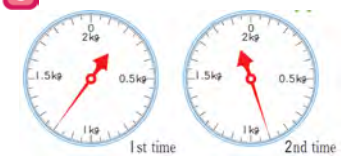
Answer : 1 40 minutes or 1 hour 40 mins

Difference

hr	m
1	10
−	30
	40

Answer: 40 minutes

③ Let's measure the total weight.



1st orange is 1.2kg
2nd orange is 0.9kg
Math sentence
1.2 + 0.9 = 2.1
Answer: 2.1kg

kg
1 1 2
+ 0 9
2 1

Answer: 2.1 kg

③ Shapes ① -- ③

① Let's name the shape described

① Circle ② Sphere ③ Equilateral triangle ④ Isosceles triangle

Exercise

1. Try to complete task 2 and 3 of shapes as homework.

Unit 20

Unit: Summary of Grade 3

Lesson 3 of 4 (Single Period)

Textbook Page : p.207
Actual Lesson 140

Lesson Objectives

- To review and confirm data and mathematical relations in Grade 3.

Prior Knowledge

- Table and graph in Grade 3

Preparation

- Grid papers

Assessment

- Solve the problems remembering what they learned in Grade 3. F
- Solve the exercises correctly. S

4 Tables and Graphs

1 The table below shows the grades of children who were absent from school during the 5 days from March 1 to March 5.

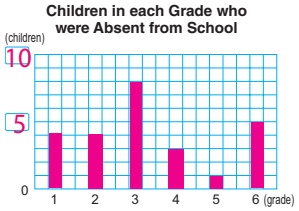
1 day	2 day	3 day	4 day	5 day
Grade 6	Grade 2	Grade 2	Grade 6	Grade 1
Grade 3	Grade 3	Grade 6	Grade 6	Grade 1
Grade 1	Grade 1	Grade 3	Grade 3	Grade 4
Grade 2	Grade 3	Grade 4	Grade 5	Grade 2
Grade 3	Grade 6	Grade 3		Grade 3
	Grade 4			

❶ Let's write the number of children in each grade in the table below.

Children in each Grade who were Absent from School

Grade		1	2	3	4	5	6
Number of children	Using tally marks	𝍸	𝍸	𝍸 |||	𝍸		𝍸	
	Using number	4	4	8	3	1	5

❷ Draw a bar graph using the table.



❸ What can you notice about the graph?

□ – □ = 207

Lesson Flow

1 ① ① Make a table of the number of students in each grade who were absent from school.

T Let students count the number of students in each grade.
TN Let students use tally marks to count to prevent miscounting.

2 ② Draw a bar graph using the table.

T What does horizontal axis show?
S Grade.
T What does vertical axis show?
S The number of children.
T The smallest scale should show how many students?
S One.
T Put the numbers on vertical axis and draw a graph.

3 ③ Discuss the findings from the bar graph.

T What did you find from the graph?
S Grade 3 is the highest number and grade 5 is the lowest.
S Grade 1 and 2 are the same number.
S The difference between the highest and the lowest is 7.
TN Let the students notice various things from the graph and deepen their understanding on how to read the graph.

Sample Blackboard Plan

Date: Chapter 20: Summary of Gr 3 Topic: Summary of Grade 3 Lesson Number: 3 out of 4

Main Task: Let's review how to arrange and represent data.

④ **Tables and Graphs**

① The table below shows 5 days absenteeism of children.

1 day	2 days	3 days	4 days	5 days
Grade 6	Grade 2	Grade 2	Grade 6	Grade 1
Grade 3	Grade 3	Grade 6	Grade 6	Grade 1
Grade 1	Grade 1	Grade 3	Grade 3	Grade 4
Grade 2	Grade 3	Grade 4	Grade 5	Grade 2
Grade 3	Grade 6	Grade 3		Grade 3
	Grade 4			

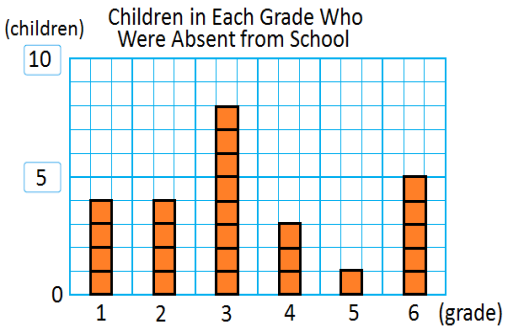
MT: Introduce main task here.

① Let's tally and number the absent children from each grade.

Children in Each Grade Who were Absent from School

Grade		1	2	3	4	5	6
Number of children	Using tally marks IIII	IIII	IIII	~~IIII~~ III	III	I	~~IIII~~
	Using number	4	4	8	3	1	5

② Let's draw a bar graph using the table.



③ Let's share what we notice about the graph.

Grade 3 has the highest number of absenteeism .
Grade 5 has the lowest number of absenteeism.
The difference between highest and lowest is 7.
Grade 1 and 2 have the same number of children absent.

Summary

- Using tally mark prevents miscounting.
- The horizontal axis shows the grade and the vertical axis shows the number of children.
- The smallest scale shows the number of children

Exercise

1. Try to come up with your own task that requires you to arrange data and represent it using a bar graph.

Unit 20

Unit: Summary of Grade 3

Lesson 4 of 4 (Single Period)

Textbook Page : p.208~p.209
Actual Lesson 141

Lesson Objectives

- To review and confirm money in Grade 3.

Prior Knowledge

- Money in Grade 3

Preparation

- Plan according to the blackboard plan.

Assessment

- Solve the problems remembering what they learned in Grade 3. F
- Solve the exercise correctly. S

5 Using money

1 Let's read orally and fill in the box. 8 19

The price of one small coffee packet is 70 t. It is [70] toea.

1. The change is one 1 kina and 30 toea. It is [5] coins of 20 toea and [3] coin of 10 toea.
2. The price of two mini coffee packets is [3] toea. It is 1 kina and 40 toea.
3. The price of a bottle of water is K1.00. It is [100] toea.
4. The price of a dozen for pencils is K2.99. It is [299] toea.

19

2 At the super market, you find the prices in the table below.

1. Fill in the table.
2. When you buy a water bottle and coffee packet, how much in total?

	Price	In Kina	In Toea
Bottle of water	K1.00	1.00 kina	100 toea
Coffee Packet	K1.20	1.20 kina	120 toea
Dozen Pencil	K2.99	2.99 kina	299 toea

3 Let's convert! 19

1. A two-kina note converts to [ ] coins of 50 toea.
2. A fifty-kina note is 3 notes of ten-kina and [10] notes of two-kina.
3. 100 kina is [4] notes of twenty-kina and [4] notes of five-kina.
4. 100 kina is [5] notes of ten-kina and [1] note of fifty-kina.
5. 19 kina is a ten-kina note and a [5] -kina note and two note of [2] -kina.
6. 89 kina is a fifty-kina note and a [20]-kina note and a [10] -kina note and a [5] -kina note and two notes of two-kina.

4 Sam bought a tray of chicken for 15.95 kina and received 4 kina and 5 toea as change. How much did he pay? 19

15 kina 95 toea + 4kina 5 toea = 20 kina A. 20 kina

5 Lucial bought a packet of rice for 4.50 kina and tinned fish for 2 kina. She received a change of 4 kina. How much did she pay? 19

4 kina 50 toea + 2kina + 4 kina = 10 kina 50 toea

A. 20 kina

208 = □ × □

□ − □ = 209

Lesson Flow

1 ① Convert the unit of currency.

T Let students convert the unit of currency.

TN Let students understand that 1 kina is equal to 100 toea.

2 ② Fill in the table.

T Ask students to fill in the table.

S Fill in the table considering the relationship between Kina and Toea.

3 ③ Think about the combination of notes.

S Think about the combination of notes to prepare certain amount of money.

TN Remind students about the types of currencies in Papua New Guinea.

4 ④ Solve word problems.

S Read and understand the situation.

S Make mathematical expressions and solve them.

TN Remind students how to add or subtract currency.

S Complete task 4 and 5 for homework.

Sample Blackboard Plan

Date: Chapter 20: Summary of Gr 3 Topic: Summary of Grade 3 Lesson Number: 4 out of 4

Main Task: Let's review our understanding about money.

MT: Introduce main task here.

5 Utilising money

1 Let's read orally and fill the ☐.

1 70t is 70 toea

2 1 kina coin and 30 toea

3 2 pkt coffee is 140 toeas

4 K1.00 is 100 toeas

5 K2.99 is 299 toeas

2 The table below shows prices at the supermarket.

1 Fill in the table.

Items	Price	In kina	In toea
1. Bottle of water	K1.00	1.00 kina	100 toea
2. Coffee Packet	K1.20	1.20 kina	120 toea
3. Dozen Pencil	K2.99	2.99 kina	299 toea

2 Let's find how much in total for 2 items.

Items	Price	In kina	In toea
1. Bottle of water	K1.00	1.00 kina	100 toea
2. Coffee Packet	K1.20	1.20 kina	120 toea
Total	K2.20	2.20 kina	200 toea

3 Let's convert

1 

2 


10 notes of 2 kina

3 

4 notes of 20 kina
4 notes of 5 kina

4 

4 notes of 10 kina
6 notes of 5 kina

5 19 kina 
Ans: one 5 kina note and two 2 kina notes

6 89 kina is 
Ans: one 20 kina, one 10 kina note and one 5 kina note

Summary

- To give the amount of the total value, know the value of notes and coins and multiply by a number notes and coins of the same value.

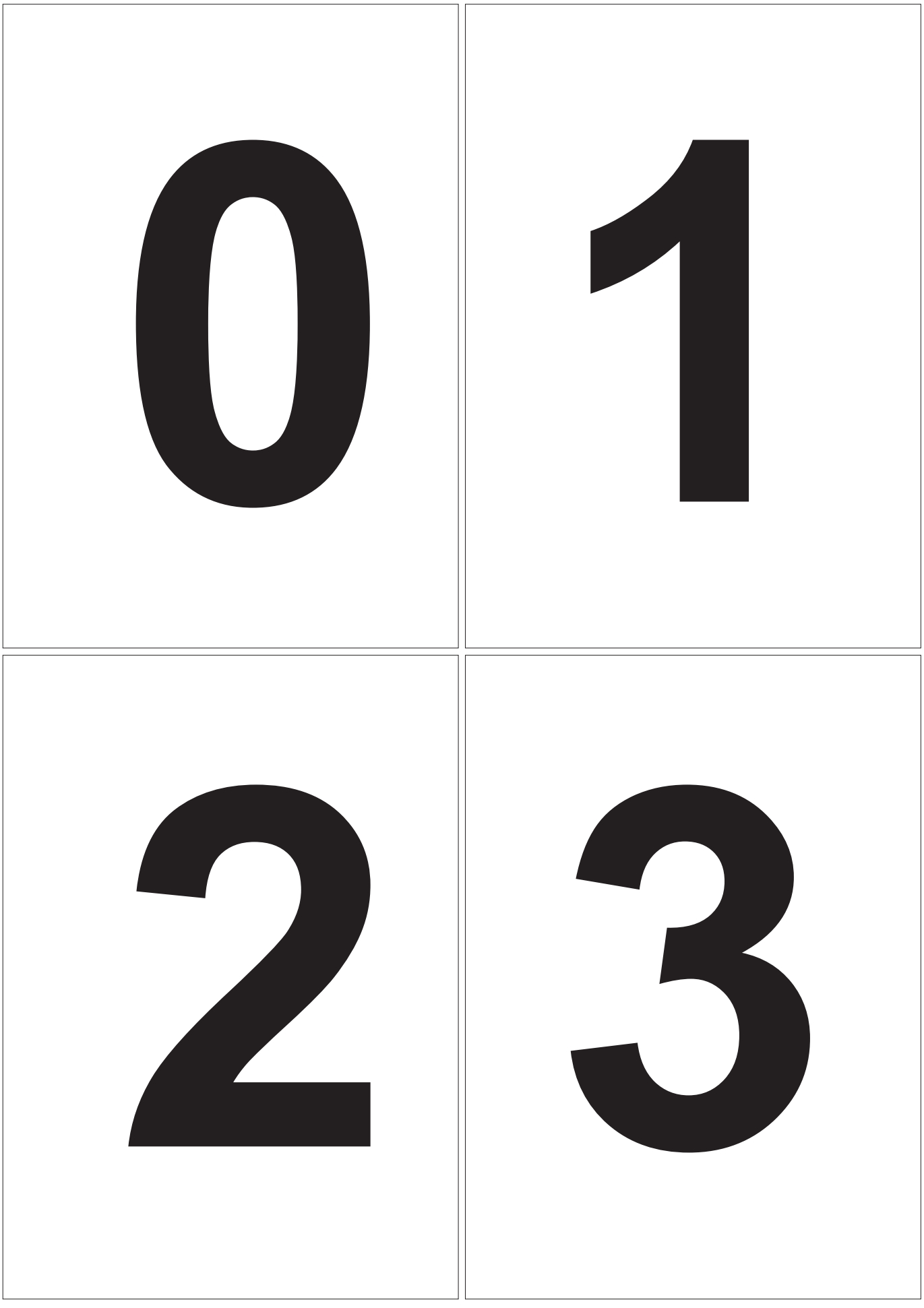
Exercise

1. Complete task 4 and 5

Let's think about the multiplication table!

Multiplier \ Multiplicand	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36	42	48	54
7	7	14	21	28	35	42	49	56	63
8	8	16	24	32	40	48	56	64	72
9	9	18	27	36	45	54	63	72	81
10	10	20	30	40	50	60	70	80	90
11	11	22	33	44	55	66	77	88	99
12	12	24	36	48	60	72	84	96	108

Let’s have fun for improving Math skills!
Number cards sample, 0 - 9 (Refer to page XIV)

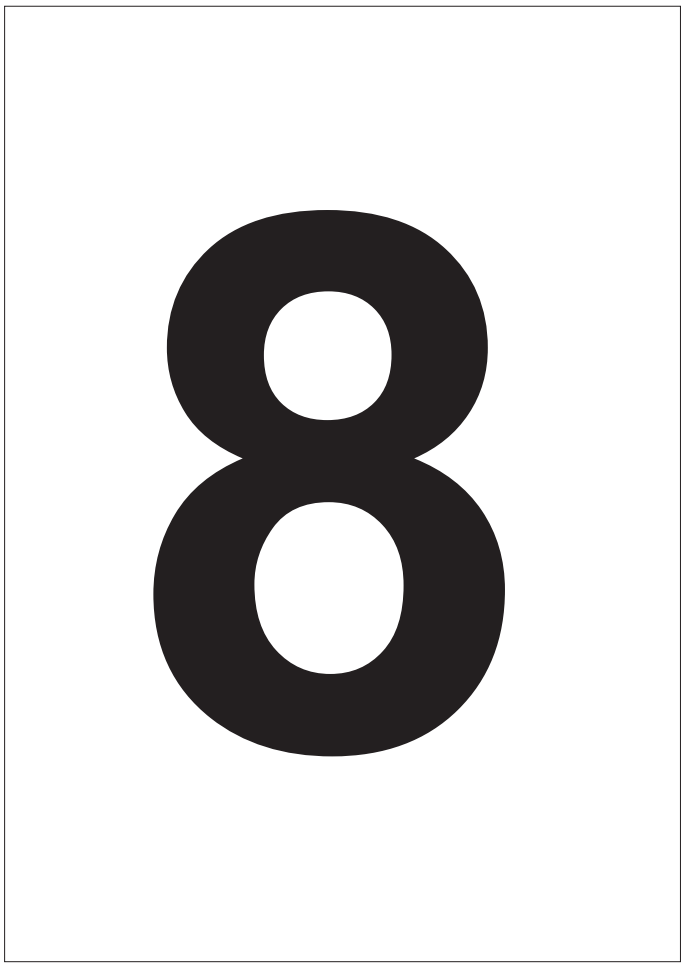


4

5

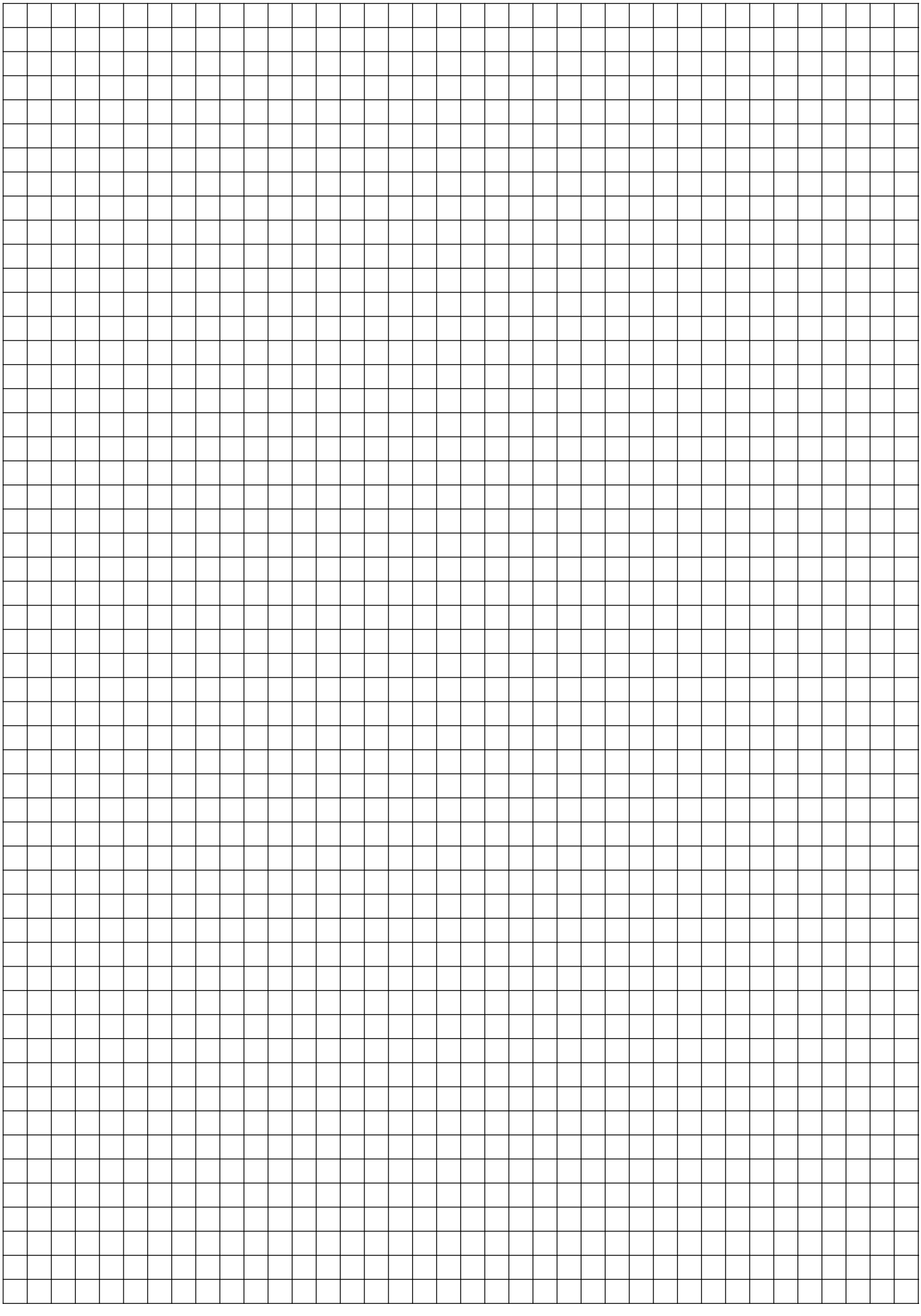
6

7

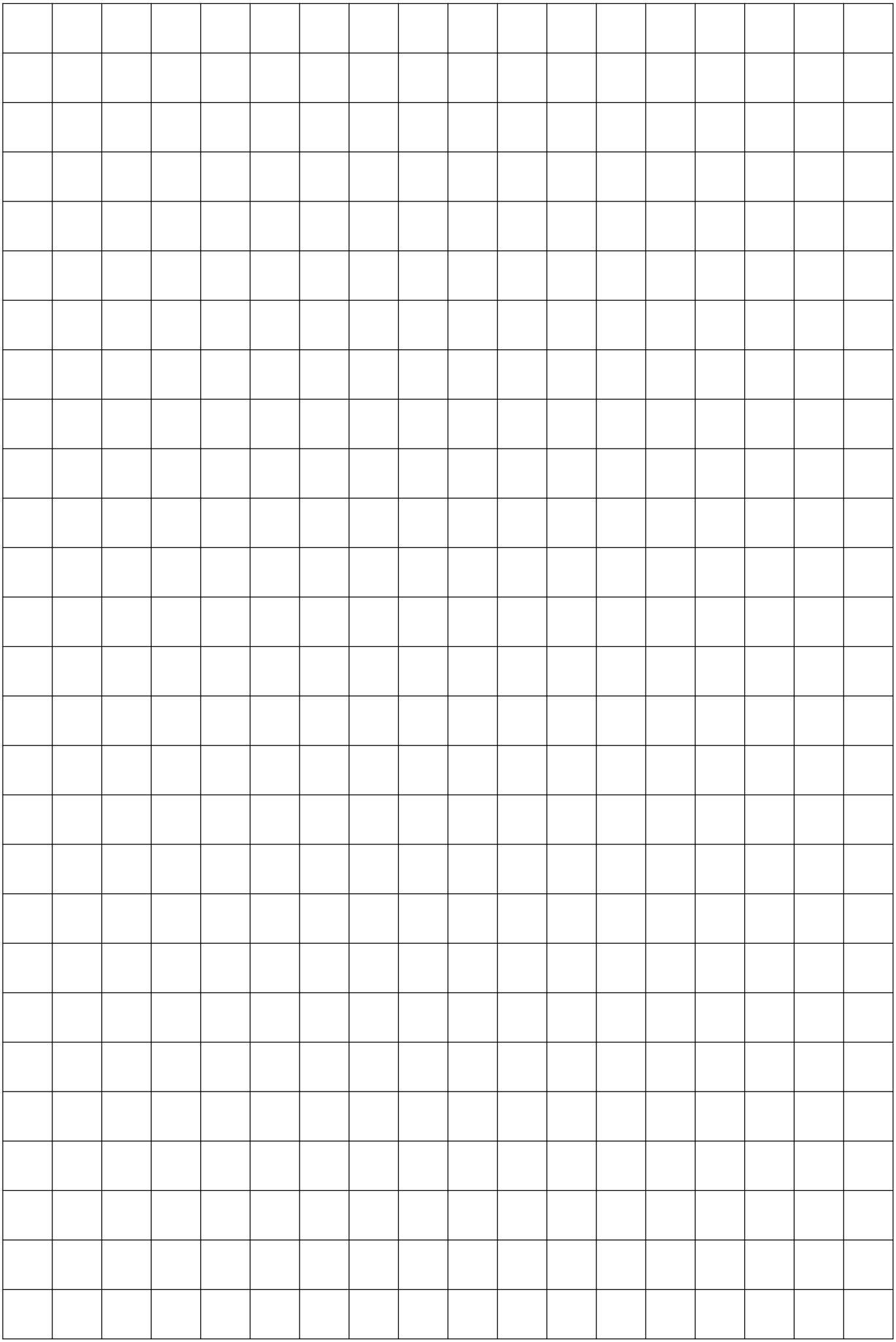

8


9

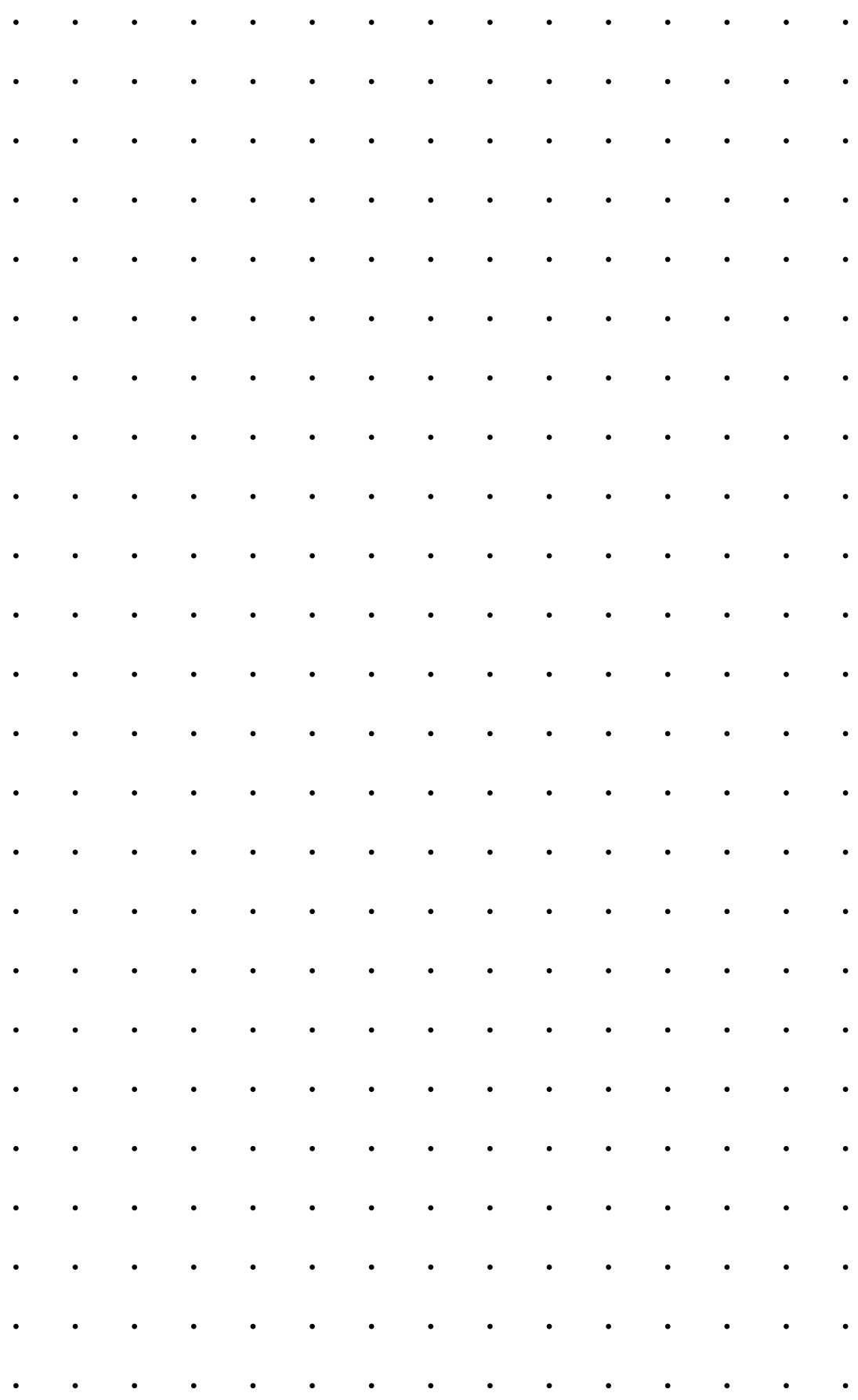
5mm^2 grid



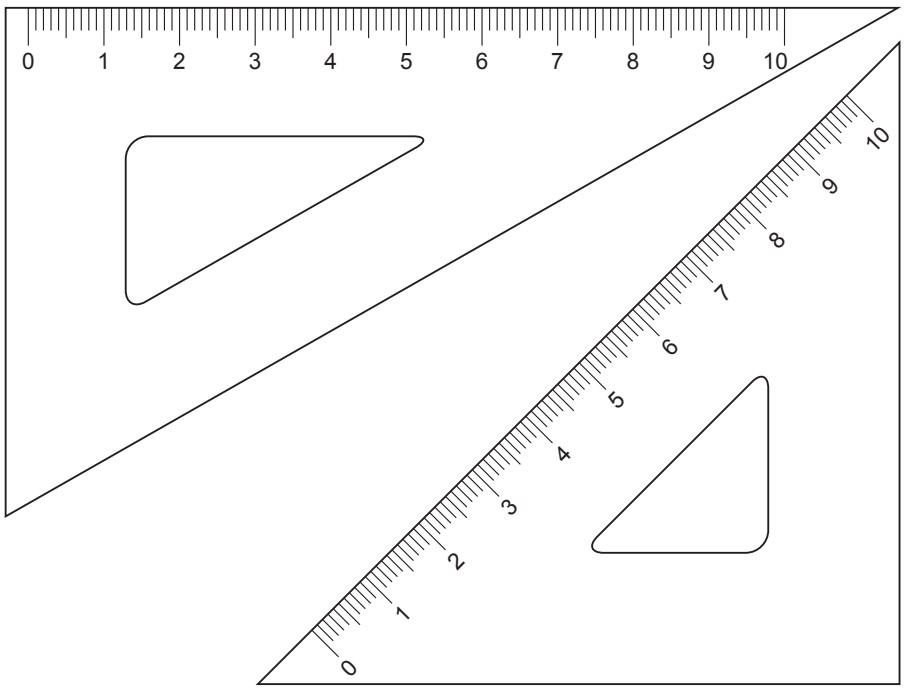
1cm^2 grid

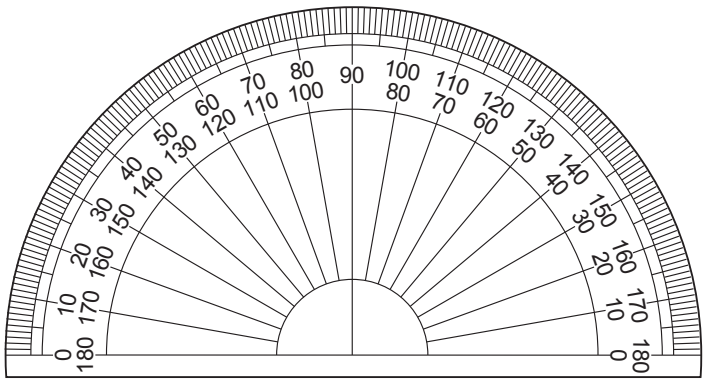


1cm^2 dotted grid



Triangle rulers and protractor





Structure of learning contents in Mathematics from Elementary Prep to Grade 8
Number and Operation

Elementary Prep - Elementary 2

Elementary Prep

+ Natural numbers up to 120

+ Additions and subtractions of one digit numbers
+ Additions and subtractions of simple 2 digit numbers

Elementary 1

+ Natural numbers up to 1000

+ Simple fractions

+ Additions and subtractions of 2 digit numbers
+ Additions and subtractions of simple 3 digit numbers

Elementary 2

+ Natural numbers up to 10000

+ Meaning of multiplication
+ Multiplication table.
+ Multiplication of simple 2 digit numbers

Grade3 - Grade4

Grade 3

+ Natural numbers less than 100 000
+ Addition and subtraction of natural numbers (with carrying & borrowing)
+ Multiplication of natural numbers
+ Meaning of division
+ Division in the simple case where divisors are 1 digit numbers

+The meaning and the representations of decimal numbers
+ Addition and subtraction of decimal numbers (the tenths place)
+The meaning and the representation of fractions
+ Simple addition and subtraction of fractions with same denominator less than 1

Grade 4

+ Natural numbers less than billion
+ Round numbers, round up and round down
+ Division in the case where divisors are 2 digit numbers
+ Acquisition and utilization of 4 operations of natural numbers

+ Addition and subtraction of decimal numbers (the tenths and the hundredths places)
+ Multiplication and division of decimals by whole numbers
+ Addition and subtraction of fractions with same denominators(proper fraction, mixed numbers)

Grade5 - Grade6

Grade 5

+ Even and odd numbers, prime numbers,multiples and divisors
+ Numeration system for decimals, fraction and whole numbers

+ Multiplications and divisions by decimals (tenths and hundredths place, etc)
+ Addition and subtraction of fractions with different denominators

Grade 6

+ Multiplication and division of fractions
+ Calculations that involve both fractions and decimals
+ Consolidation and utilization of the 4 basic operations of decimals and

Grade7 - Grade 8

Grade 7

Positive numbers, negative numbers
+ Necessity and meaning of positive and negative numbers (set of numbers and the 4 fundamental operations)
+ Four basic operations with positive and negative numbers

Algebraic expressions using letters
+ Necessity and meaning of using letters
+ How to express multiplication and division
+ Addition and subtraction with linear expressions
+ Representing with algebraic expressions with letters (representations in inequality)

Linear equations with one unknown
+ Meaning of equations and their solutions
+ Property of equality and how to solve equations
+ Solving and using linear equations (proportional expressions)

Grade 8

Calculations of 4 basic operations with expressions using letters
+ Calculations of addition and subtractions with simple polynomials, as well as multiplication and division with monomials

Simultaneous linear equations with two unknowns
+ Necessity and meaning of simultaneous linear equations with two unknowns and the meaning of their solutions
+ Meaning of simultaneous equations and their solutions
+ Solving simultaneous equations and applying them

Quantities and Measurements

Elementary Prep - Elementary 2

Elementary Prep

+ Comparing amount of length, area, volume (arbitrary)

+ Telling clock times (O'clocks)

Elementary 1

+Unit of length (cm, mm, m)

+ Reading times

Elementary 2

+Unit of volume(L, dL, mL)

+Unit of time (day, hour, minute, second)

Grade3 - Grade4

Grade 3

+Unit of length (km)
+Unit of weight (g, kg, t)

+Calculations with time

Grade 4

+Unit of area (square cm, square m, square km, a, ha)
+Finding area of rectangle and square
+Unit of angle (degree)

Grade5 - Grade6

Grade 5

+Area of triangles, rectangles, parallelograms, trapeziums and rhombi
+Unit of volume (cubic cm, cubic m, mL, kL)
+Volume of cuboids and cubes

+Mean of measurements
+Per unit quantity

Grade 6

+Area of approximate shape
+Area of a circle
+Volume of prisms

+Metric system

+Speed

Grade7 - Grade 8

Grade 7

+Volume cylinders

Geometrical figure

Elementary Prep - Elementary 2

ELementary Prep

+Observing and composing the shapes of planer figures and solid figures

Elementary 1

+Triangles, quadrilaterals, rectangles, squares, right triangles

+shape of a box

Elementary 2

+Circle, sphere

Grade3 - Grade4

Grade 3

+Isosceles triangle, equilateral triangle
+Angle

Grade 4

+Perpendicular and parallel
+Parallelogram, rhombus, trapezium

+Cube, cuboid

Grade5 - Grade6

Grade 5

+Polygons and regular polygons,(irregular polygons)
+Congruence of triangles and quadrilaterals
+Circular constant

+Prisms, cylinders, sketches, nets

Grade 6

+Line symmetry, point symmetry
+Enlarged and reduced figures

Grade7 - Grade 8

Grade 7

Plane figures
+Fundamental methods for constructing of figures and their applications
+Moving figures (parallel translation, symmetric transformation, rotation)

Space figures
+Positional relationship between straight lines and planes
+Structure of space figures and their representation on the plane (sketches, nets, projection drawings)
+Length of arc of a sector and area of the sector
+Surface area and volume of prisms, cones and spheres

Grade 8

Basic plane figures and properties of parallel lines
#Properties of parallel lines and angles
#Properties of angles of polygons

Congruence of plane figures
+Congruence of plane figures and conditions of congruence of triangles
+Necessity, meaning and methods of proof
+Basic properties of triangles and parallelograms

Mathematical relations

Elementary Prep - Elementary 2

Elementary Prep

+Representing the number of objects using pictures and figures

Elementary 1

+Relationship between addition and subtraction

+Basic table and graphs

Elementary 2

+Representing situations where multiplication is used

+Tables and bar graphs in pictorial /symbols

Grade3 - Grade4

Grade 3

+Representing the situations where divisions are used by using algebraic expressions
+Making connections between algebraic expressions and diagrams. Algebraic expressions that use empty boxes

+Tables and graphs(Bar +Columus) in numerical representation

Grade 4

+Algebraic expressions that contain some of the 4 basic operations and
expressions with brackets and formulas.
+Expressions with empty boxes and empty triangles

+Relationship between two numbers/quantities as they vary simultaneously

+Points, broken line graphs

Grade5 - Grade6

Grade 5

+ Simple proportional relations
+Relations of two quantities that are expressed by simple algebraic relations

+Percentage, pie charts

Grade 6

+Algebraic expressions using letters such as x or a

+Proportional relationship

+Proportion and inverse proportion

+The Average of data, frequency distribution, histgram

Grade7 - Grade 8

Grade 7

Direct proportion and Inverse proportion
+Meaning of functional relationship
+Application of direct proportion and inverse proportion
Dispersion of data and representative value of data
+ Necessity and meaning of histogram and representative values
+ Applying histogram and representative values

Grade 8

Linear functions
+ Phenomena and linear functions
+ Tables, algebraic expressions and graphs of linear functions
+ Linear equations with two unknowns and functions
+ Using linear functions

Probability
+ Necessary and meaning of probability and finding the probability

Mathematics Grade 3 Teacher's Manual Development Committee

The Mathematics Teacher's Manual was developed by Curriculum Development Division (CDD), Department of Education in partnership with Japan International Cooperation Agency (JICA) through the Project for Improving the Quality of Mathematics and Science Education (QUIS-ME Project). The following stakeholders have contributed to manage, write, validate and make quality assurance for developing quality Textbook and Teacher's Manual for students and teachers of Papua New Guinea.

Joint Coordinating Committee members for QUIS-ME Project

Dr. Uke Kombra, Secretary for Education - Chairperson, Mr. Walipe Wingi, Deputy Secretary - Deputy Chairperson, Mr. Baran Sori, Mr. Samson Wangihomie, Mr. Titus Romano Hatagen, Dr. Eliakim Apelis, Mr. Godfrey Yerua, Mrs. Annemarie Kona, Mr. Camilus Kanau, Mr. Joseph Moide, Mr. Peter Kants, Mr. Maxton Essy, Mr. Steven Tandale, Ms. Hatsie Mirou, Mr. Paul Ainui, Mr. Packiam Arulappan, Mr. Allen Jim, Mr. Nopa Raki, Mr. Gandhi Lavaki, Mr. John Kakas, Ms. Philippa Darius, Mr. Alex Magun, Ms. Mary Norrie, Mr. James Namari, Ms. Kila Tau, Mr. Moses Hatagen Koran, Ms. Colette Modagai, Ms. Dorothy Marang, Mr. Dan Lyanda, Representatives from Embassy of Japan and JICA PNG Office, Mr. Akinori Ito, MPS, Mr. Chiko Yamaoka and other Project Experts

Steering Committee members for QUIS-ME Project

Mrs. Annemarie Kona, First Assistant Secretary - Chairperson, Mr. Steven Tandale - Assistant Secretary, CDD - Deputy, Chairperson, Ms. Hatsie Mirou, Mr. Paul Ainui, Mr. Gandhi Lavaki, Mr. John Kakas, Ms. Philippa Darius, Mr. Alex Magun, Ms. Mary Norrie, Mr. James Namari, Ms. Kila Tau, Mr. Moses Hatagen Koran, Ms. Mary Phillips, Mr. Nopa Raki, Mr. Geoff Gibaru, Ms. Jean Taviri, Mr. Akinori Ito, MPS, Mr. Chiko Yamaoka, Mr. Satoshi Kusaka, Mr. Ryuihi Sugiyama, Mr. Kenichi Jibutsu, Ms. Masako Tsuzuki, Dr. Kotaro Kijima, Ms. Kyoko Yamada and Representatives from Textbook writers and JICA PNG Office

Curriculum Panel

Mr. Steven Tandale, Mr. Gandhi Lavaki, Ms. Philippa Darius, Mr. Alex Magun, Mr. John Kakas, Ms. Mirou Avosa, Ms. Mary Norrie, Mr. Gilbert Ikupu, Mr. John Wek, Betty Bannah, Mr. Vitus Witnes, Ms. Clemencia Dimain and Ms. Celine Vavetaovi

Editorial Supervisors

Prof / Dr. Masami Isoda, Mr. Satoshi Kusaka, Mr. Katsuaki Serizawa and Mr. Akinori Ito, MPS

Content Supervisors

Ms. Kyoko Yamada, Prof. Hiroki Ishizaka, Prof. Yoichi Maeda and Prof. Takeshi Sakai

Writers & Proofreaders (Curriculum Officers & Textbook writers - Math working Group)

Ms. Mary Norrie - Math Working Group Leader, Mr. James Namari, Ms. Kila Tau, Mr. Anda Apule, Ms. Pisah Thomas, Ms. Michelle Pala, Ms. Ileen Palan, Ms. Hilda Tapungu, Mr. Armstrong Rupa and Mr. Gibson Jack

Chief Proofreader, Illustrators, Photos & Desktop Publishing

Mr. Alex Magun (Chief Proofreader), Mr. Micheal John (Illustrator), Mr. David Gerega, Mr. Vitus Witnes (Graphic designers), Mr. Armstrong Rupa, Mr. Gibson Jack, Ms. Yoshiko Osawa, Ms. Michiyo Ueda (Desktop Publishing), Mr. Chiko Yamaoka (Photographer) and Gakko Tosho Co.,Ltd. (Photos and illustrations)

Validation Team (Math working group & Teachers from pilot schools)

Ms. Aiva Koia, Ms. Aloisia Charles, Ms. Anne Auhava, Ms. Glenda Blasius, Ms. Idau Rea, Ms. Jacklyn Kerowa, Mrs. Johanne Wambriwari, Mr. John Otai, Ms. Lee Kalinoe, Ms. Linda Wami, Ms. Marcia Pau, Ms. Serah Robinson, Ms. Sheila Sabarei, Ms.Susie Pet, Ms. Sussie Kipak and Mrs. Theresa Paisoi

Cooperation

Japan International Cooperation Agency (JICA), Department of National Planning & Monitoring (DNPM), Bank of Papua New Guinea, Centre for Research on International Cooperation in Education Development (CRICED) - University of Tsukuba, Naruto University of Education, Gakko Tosho Co.,Ltd. , Gaire Primary School, Iobuna Kouba Primary School, Koki Primary School, Koiari Park Primary School, St. John Primary School, St. Peter Primary School, St. Therese Primary School, Sogeri Primary School, Tubuseria Primary School and Wardstrip Primary School.

Department of Education

From the People of Japan

JICA

筑波大学 University of Tsukuba

国立大学法人 鳴門教育大学 Naruto University of Education

GAKKO TOSHO CO.,LTD.

IC Net Limited アイ・シー・ネット株式会社

PADECO


From
the People of Japan