National MATHEMATICS Textbook

Grade 3

Papua New Guinea
Department of Education

From
the People of Japan

JICA

QUIS-ME
We love Maths and Science!
Department of Education & JICA

Issued free to schools by the Department of Education

First Edition

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Acknowledgements

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National Mathematics Textbook

Grade 3

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Department of Education

From the People of Japan

Minister's Message

Dear Grade 3 Students,

I am honoured to give you my message in this National Mathematics Textbook.

The Government of Papua New Guinea has been working to improve students' learning of mathematics. This textbook was developed by our excellent Curriculum Officers, Textbook Writers and Pilot Teachers, who have worked together with Japanese specialists for three years. This is the best textbook for grade 3 students in Papua New Guinea and is comparable to international standards. I would like to thank the Government of Japan for its support in improving the quality of learning for children in Papua New Guinea.

I am excited about this textbook because it covers all topics necessary for learning in grade 3. You will find many photographs, illustrations, charts and diagrams that are interesting and exciting for learning. I hope they will motivate you to explore more about mathematics.

Students, Mathematics is a very important subject. It is also very interesting to learn. Do you know why? Because mathematics is everywhere in our lives. You will use your knowledge and skills of mathematics to calculate cost, to find time, distance, weight, area, and many more. In addition, mathematics will help you to develop your thinking skills, such as how to solve problems using a step-by-step process.

I encourage you to be committed, enjoy and love mathematics, because one day in the future you will be a very important person, participating in developing and looking after this very beautiful country of ours and improving the quality of living.

I wish you a happy and fun learning experience with Mathematics.

Hon. Nick Kuman, B.ApSci.UWSyd, MP

Minister of Education

Message from the Ambassador of Japan

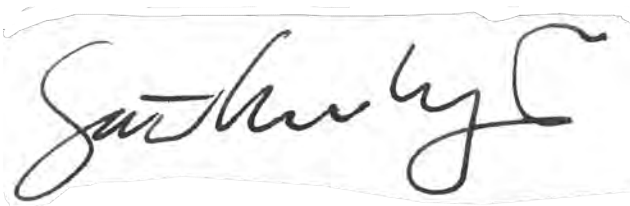
Greetings to Grade 3 Students of Papua New Guinea!

It is a great pleasure that the Department of Education of Papua New Guinea and the Government of Japan worked together to publish national textbooks on mathematics for the first time.

The officers of the Curriculum Development Division of the Department of Education made full efforts to publish this textbook with Japanese math experts. To be good at mathematics, you need to keep studying with this textbook. In this textbook, you will learn many things about mathematics with a lot of fun and interest, and you will find it useful in your daily life. This textbook is made not only for you but also for the future students.

You will be able to think much better and smarter if you gain more knowledge on numbers and diagrams through learning mathematics. I hope that this textbook will enable you to enjoy learning mathematics and enrich your life from now on. Papua New Guinea has a big national land with plenty of natural resources, and a great chance for a better life and progress. I hope that each of you will make full use of knowledge you obtained and play an important role in realising such potential.

I am honoured that, through the publication of this textbook, Japan helped your country develop mathematics education and improve your ability, which is essential for the future of Papua New Guinea. I sincerely hope that, through the teamwork between your country and Japan, our friendship will last forever.



Satoshi Nakajima

Ambassador of Japan to Papua New Guinea

Share ideas with your friend!

Let's learn Mathematics, it's fun!

Secretary's Message

Dear students,

This is your Mathematics Textbook that you will use in Grade 3. It contains very interesting and enjoyable activities that you will be learning in your daily Mathematics lessons.

In our everyday lives, we come across many Mathematical related situations such as buying and selling, making and comparing shapes and their sizes, travelling distances with time and cost, and many more. These situations require mathematical thinking processes and strategies to be used.

This textbook provides you with a variety of mathematical activities and ideas that are interactive and allow you to learn with your teacher or on your own as an independent learner. Key concepts for each topic are highlighted in the summary notes at the end of each chapter. The mathematical skills and processes are expected to be used as learning tools to understand the concepts given in each unit or topic and apply these in solving problems.

You are encouraged to be like a young Mathematician who learns and is competent in solving problems and issues that are happening in the world today. You are also encouraged to practice what you learn everyday both in school and at home with your family and friends.

I wish you all the best in studying Mathematics using this textbook.

Dr. Uke Kombra, PhD
Secretary for Education

Friends learning together in this textbook


Mero


Naiko


Sare


Gawi


Kapi
(Kapul)


Kekeni


Ambai


Vavi


Yamo


Koko
(Kokomo)

Symbols in this textbook

- Discovered Important Ideas

- Important definition or terms.

- What we will do in the next activity.

- When you lose your way, refer to the page number given.

- You can use your calculator here.

- Practice by yourself. Fill in your copy.

- New knowledge to apply in daily life

- Let's do the exercise.

- Let's do mathematical activities by students

$6 = \square \times \square$

- Let's fill numbers in and complete the expression to get the page number

What We Learned In Elementary School

Numbers and Calculations

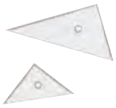
2nd grade

Numbers up to 10000

Thousands place	Hundreds place	Tens place	Ones Place
two thousand	three hundred	Forty	Six
2	3	4	6

The number for 10 sets of 1000 is called "ten thousand" and written as 10000.

The numbers of two thousand, three hundred and forty six altogether is **"two thousand three hundred and forty six"**. It is written as 2346.



Multiplication

2nd grade

Multiplication Table

Mathematical sentence for multiplication is (Number for each set) ×(number of sets) =(Total number).

	1	2	3	4	5	6	7	8	9
1 row of 1	1	2	3	4	5	6	7	8	9
2 row of 2	2	4	6	8	10	12	14	16	18
3 row of 3	3	6	9	12	15	18	21	24	27
4 row of 4	4	8	12	16	20	24	28	32	36
5 row of 5	5	10	15	20	25	30	35	40	45
6 row of 6	6	12	18	24	30	36	42	48	54
7 row of 7	7	14	21	28	35	42	49	56	63
8 row of 8	8	16	24	32	40	48	56	64	72
9 row of 9	9	18	27	36	45	54	63	72	81

Addition in Vertical Form

2nd grade

How to Add 38+27 Using the Vertical Form

$$\begin{array}{r} 38 \\ +\,27 \\ \hline \end{array} \rightarrow \begin{array}{r} 38 \\ +\,27 \\ \hline 5 \end{array} \rightarrow \begin{array}{r} 38 \\ +\,27 \\ \hline 65 \end{array}$$

Ones place | Tens place

Write same place values in the same column. Add the ones place first.

8+7=15 The ones place is 5. Carry 1 ten to the tens place.

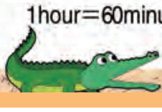
1 ten was carried, so 3+2+1=6. The tens place is 6.

Measurement

Duration and Time

2nd grade

1hour=60minutes 1day=24hours



Subtraction in Vertical Form

2nd grade

How to Subtract 45−27 with the Vertical Form

$$\begin{array}{r} 45 \\ -\,27 \\ \hline \end{array} \rightarrow \begin{array}{r} \scriptstyle 3\ 10 \\ 45 \\ -\,27 \\ \hline 8 \end{array} \rightarrow \begin{array}{r} \scriptstyle 3\ 10 \\ 45 \\ -\,27 \\ \hline 18 \end{array}$$

Ones place | Tens place

Write the numbers in each column.

Borrow 1 ten as 10 ones, so 15−7=8 The ones place of the answer becomes 8.

1 ten has been borrowed to the ones place, so 3−2=1.

Shapes

1st grade

Making Shapes

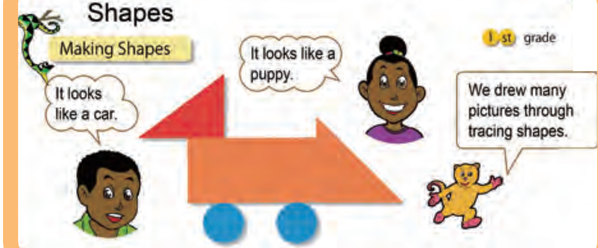


Table of Contents

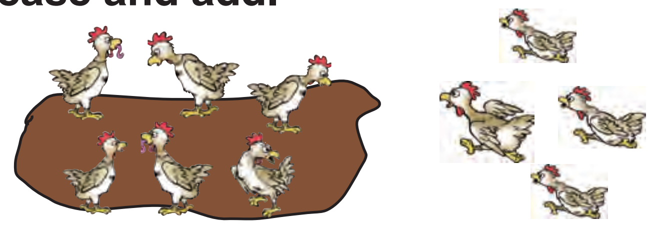
1 Addition and Subtraction 1

1 What We Learned in Elementary School

Addition Story

1 Let's make mathematics stories using such words as **in total, altogether, more, increase and add.**

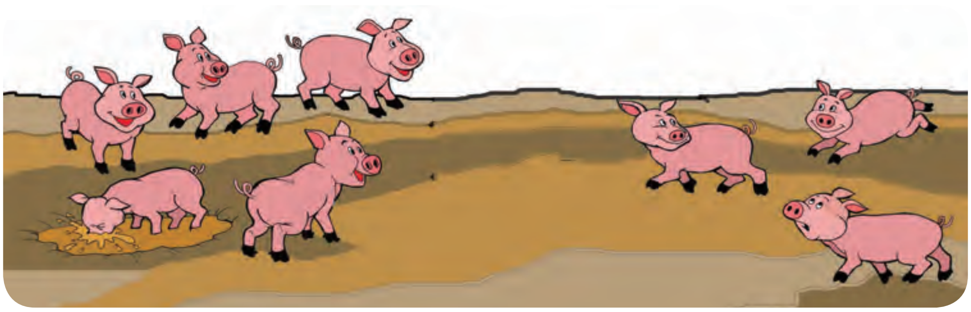
① A mathematics story for $6+4$.



There are a group of ☐ chickens. ☐ chickens are added to the group. How many chickens are there in ☐.

The number of chickens was ☐ at first. The number of chickens was increased by ☐.
How many chickens are there?

② A mathematics story for $5+3$.



There are ☐ pigs and ☐ pigs.
How many pigs are there ☐

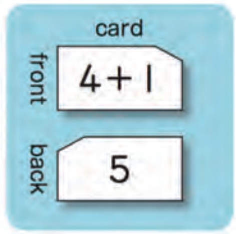
2 Let's make various mathematics stories for the following.

① $4+5$ ② $4+3$ ③ $6+3+1$

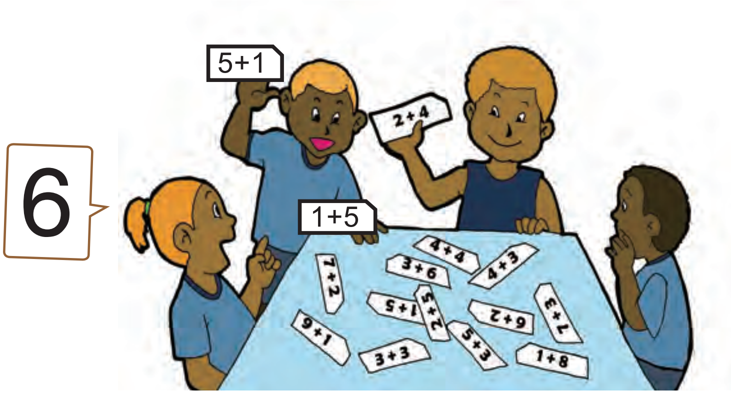
Addition Cards

3 Let's play a fun game to master addition using addition cards.

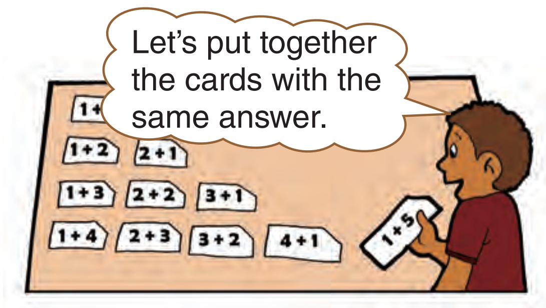
1. Use addition cards of answers up to 10.
   In pairs, one student points to a card with a mathematic expression, and the friend says the answer.



2. Make groups of 4 or 5. Group leader calls a number. Other members find the cards with the expression of same answer.



3. Line up the cards that have the same answer. Arrange the cards in order and identify the pattern.



4 Let's play making 10 by adding two numbers.

Teacher shows a number.

① Look at the teacher's flash card from 1 to 9 and add a number to make 10

② Look at the blocks and fill numbers in □ and □ to make 10.


9 and 1 → 10 (9 | 1)


8 and 2 → 10 (8 | 2)


□ and □ 10 (□ | □)


□ and □ 10 (□ | □)


□ and □ 10 (□ | □)

③ Let's find other cases to make 10. How do you find all cases?

2 and 8 10 (2 | 8)   9 and 1 10 (9 | 1)

□ and □ 10 (□ | □)   □ and □ 10 (□ | □)

□ and □ 10 (□ | □)   □ and □ 10 (□ | □)

④ Let's add and find the same answers.

① 3 + 6   ② 6 + 4   ③ 6 + 0

④ 2 + 8   ⑤ 7 + 3   ⑥ 4 + 6

Let's try T-Math calculation!!
T-Math is a Table-Mathematics. You can find pattern of answers. It is so amazing! All the best! Have fun!

Remember!!
6 + 2, we call that
6 is **Augends** and
2 is **Addends**

1. Let's fill in the answer for addition, (augend) + (addend), in the following T-Math.

T-Math Addition		Addends									
		1	2	3	4	5	6	7	8	9	10
Augends	1	2		4		6		8		10	
	2	3	4		6		8		10		
	3			6				10	11		
	4	5	6								
	5					10					
	6	7	8								
	7										
	8	9	10								
	9									18	
	10										

2. Let's fill in anwers for addition in the following T-Math.

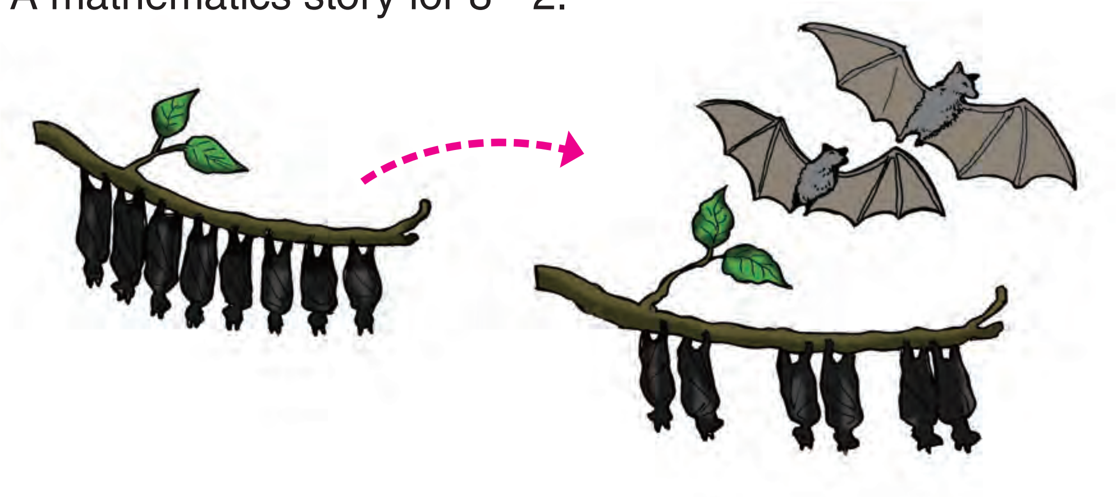
T-Math Addition		Addends									
		1	2	3	9	10	5	6	7	8	4
Augends	7										
	4	5	6								8
	3			6					10	11	
	9				18						
	10										
	5						10				
	6	7	8								
	2	3	4					8		10	6
	8	9	10								
	1	2		4	10		6		8		

3. Let's compare the tables 1 and 2 and explain how to tell the difference.

Subtraction story

5 Let's make mathematics stories using words such as left, remain, decrease, more, less and difference.

① A mathematics story for $8-2$.



There are $\square$ flying foxes hanging on the tree.
$\square$ flying foxes flew away.
How many flying foxes are $\square$?

There are flying foxes hanging on the tree.
The number of flying foxes decreased by $\square$.
How many flying foxes $\square$?

② A mathematics story for $9-6$

There are $\square$ girls and $\square$ boys.
What is the difference between the number of girls and boys?

There are $\square$ pencils and there are $\square$ pens.
How many $\square$ pens are there than pencils ?

6 Let's make various mathematics stories for the following:

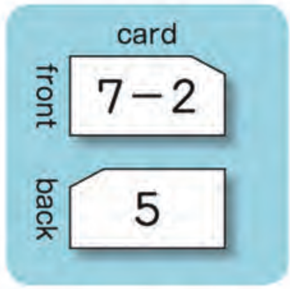
① $8-5$ ② $10-7$ ③ $3+7-7$

④ $12-7$ ⑤ $12-5-2$

Subtraction Cards

7 Let's play a fun game to master subtraction using subtraction cards.

1. Use subtraction cards of which minuends are up to 10. In pairs, one student shows a card and the friend says the answer.

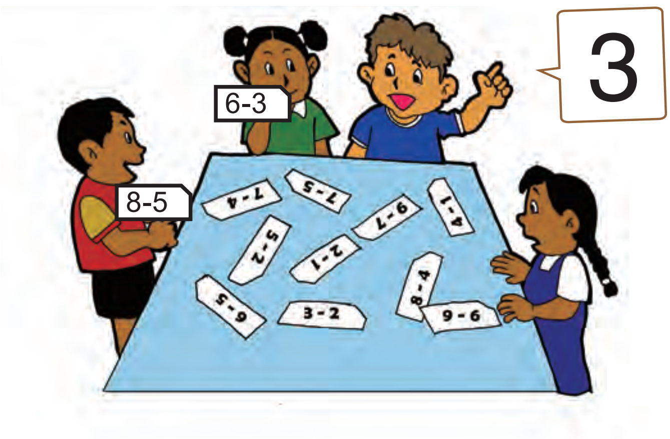


Remember

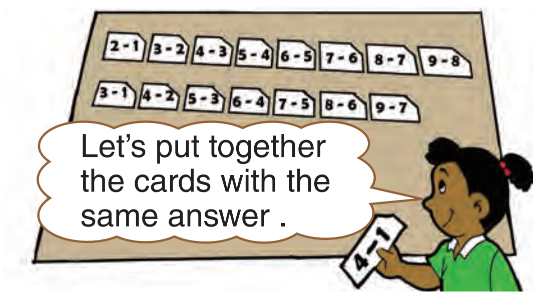
7 − 2 = 5

Minuend (7), **Subtrahend** (2)

2. Make groups of 4 or 5. Group leader calls a number. Members find the cards with the same answer.



3. Line up the cards that have the same answer. Let's explain your arrangement of cards which have the same answer.



Homework

❶ Let's fill in the answers for subtraction, (minuend) – (subtrahend), in the following T-Math.

T-Math Subtraction		Subtrahends									
		1	2	3	4	5	6	7	8	9	10
Minuends	1	0	-	-	-	-	-	-	-	-	-
	2		0	-	-	-	-	-	-	-	-
	3	2		0	-	-	-	-	-	-	-
	4		2		0	-	-	-	-	-	-
	5	4		2		0	-	-	-	-	-
	6										
	7	6									
	8										
	9	8								0	
	10										

❷ Let's fill in the answers for subtraction in the following T-Math.

T-Math Subtraction		Subtrahends									
		1	2	3	9	5	6	7	10	8	4
Minuends	7							0		-	
	4									-	0
	3			0						-	
	9				0						
	5					0				-	
	6						0			-	
	2		0							-	
	8									0	
	10								0		
	1	0	-	-	-	-	-	-	-	-	-

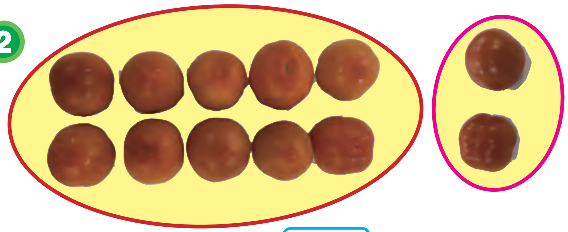
❸ Let's compare the tables ❶ and ❷ and explain how to develop T-Math table for subtraction.

Hundreds, tens and ones

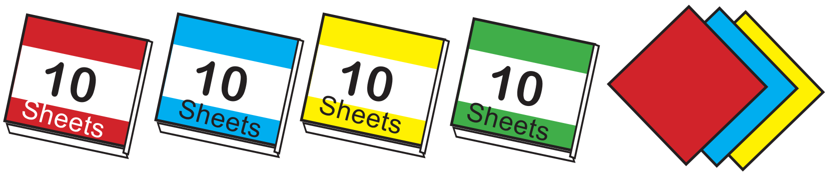
8 How many are there?

① 

□ eggs

② 

□ tomatoes

③ 

□ sheets

9 Fill in each □ with a number.

① 3 tens and 7 ones make □.

② 25 is made up of □ tens and □ ones.

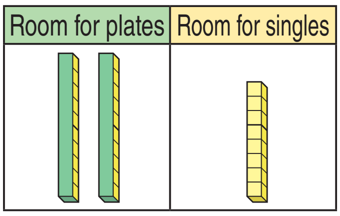
③ 4 tens and □ ones makes 46.

④ 40 is made up of □ tens.

Remember.
This is called block diagram.

10 Let's fill in the □ with a number.

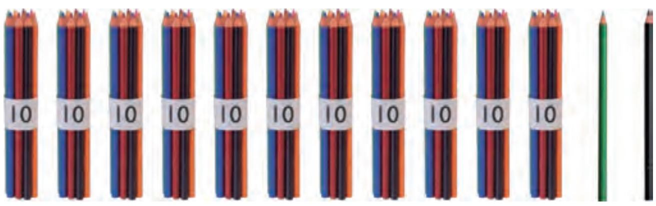
□ sets of 10 tomatoes and □ tomatoes.

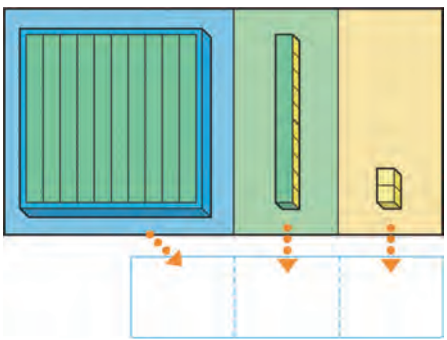


Tens place	Ones place
2	8

28

11 How many pencils are there?





Mental Addition

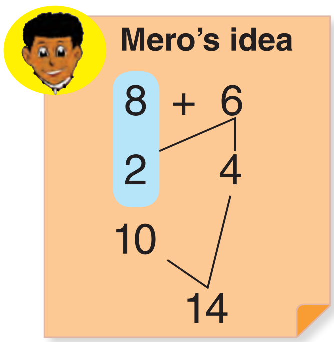
This is very interesting and important skills for daily life. Let's master mental calculation.

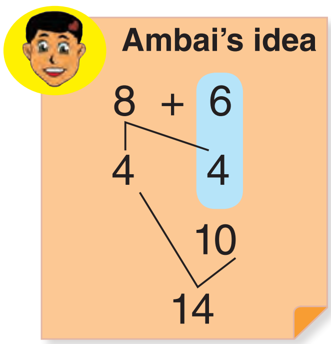
12 Think about how to calculate 8+6 in your mind.

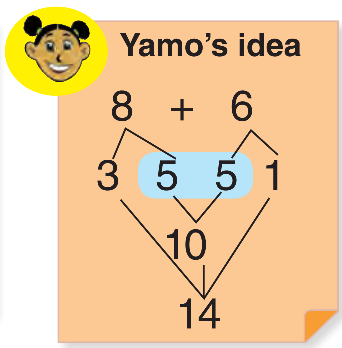
I made 10 from 8, so removed 2 from 6. Finally I added the left 4.

I made 10 from 6, so I removed 4 from 8.

I made 10 by removing 5 each from 8 and 6.







13 Let's calculate using the ideas above.

Don't use your fingers. Calculate in your mind quickly by making 10

1. 7+6
2. 8+9
3. 9+6

14 Find the answers mentally and explain.

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

15 Let's fill in the addition cards.

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

Give the answers for addition cards.
Let's fill in the blank cards.
Which place do you fill in first?
Explain the ways of the arrangements.

Homework

1 Let’s fill in the addition expression in the following T-Math and say the answer.

T–Math Addition		Addends									
		1	2	3	4	5	6	7	8	9	10
Augends	1	1+1	1+2								
	2	2+1									
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	10										

2 After filling in the expressions in the following T-Math 1, let’s colour yellow when the answers of expressions are 10 and colour green when the answers of expressions are 14.

T–Math Addition		Addends												
		1	2	3	4	5	6	7	8	9	10			
Augends	1	1+1	1+2											
	2	2+1												
	3													
	4													
	5													
	6													
	7													
	8													
	9													
	10													

Mental Subtraction

16 Think about how to calculate $14-6$ in your mind.

Sare's idea

$14 - 6$

$4 \quad 10 - 6 = 4$

8

Kekeni's idea

$14 - 6$

$14 - 4 = 10 \quad 2$

$10 - 2 = 8$

It's easy to subtract from 10.
I splitted 14 between 10 and 4.
I subtracted 6 from the 10
splitted. I got 4 and added
to the splitted 4.

I wanted to subtract 4 from
14, so that I get 10.
I subtracted, 2 more from
the 10, so that I have
subtracted 6 in total.

17 Let's calculate using the ideas above.

1. $11-4$
2. $13-9$
3. $17-8$

18 Find the answer and explain how to calculate.

1. $17-9$
2. $15-7$
3. $13-6$
4. $12-7$
5. $11-5$
6. $11-8$
7. $12-8$
8. $16-8$

19 Let's fill in the subtraction cards.

11−2	12−2	13−4	14−5	15−6	16−7	17−8	
11−3		13−5	14−6	15−7	16−8	17−9	
11−4	12−5	13−6	14−7	15−8	16−9		
11−5	12−6	13−7		15−9			
11−6	12−7		14−9				
	12−8	13−9					
11−8	12−9						
11−9							

Give the answers for subtraction cards.
Let's fill in the blank cards.
Which place do you fill in first?
Explain the ways of the arrangements.

Homework

1. Let's fill in the expression for subtraction (minuend) – (subtrahend), in the following table.

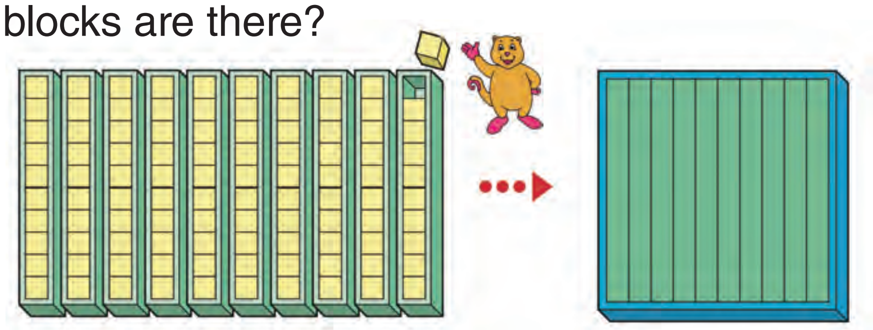
T - Math Subtraction		Subtrahend									
		1	2	3	4	5	6	7	8	9	10
Minuend	10	10 − 1	10 − 2								
	11	11 − 1									
	12										
	13										
	14										
	15										
	16										
	17										
	18										
	19										
	20										

2. Let's fill in answers for the subtractions in the following table.

T - Math Subtraction		Subtrahend									
		1	2	3	4	5	6	7	8	9	10
Minuend	10										
	11										
	12										
	13										
	14										
	15										
	16										
	17										
	18										
	19										
	20										

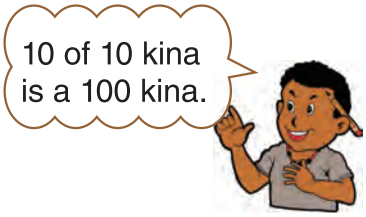
3. Let's develop the T-Math for subtraction and ask your friends to fill in each space.

20 How many blocks are there?

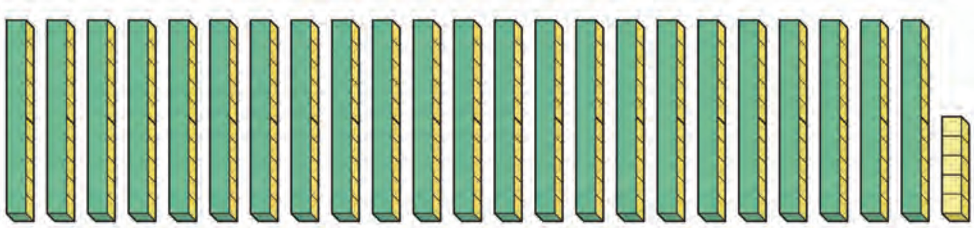


100 blocks

10 sets of 10 is a hundred ➡ 100



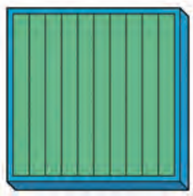
1. How many more does 96 need to become 100?
2. What number is 10 less than 120?
3. Look at the picture below and fill in the □.



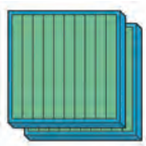
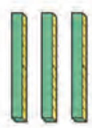
There are □ boxes of 10 and □ ones blocks.

10 sets of 10 boxes make 100.

Then, there are □ sets of 100.

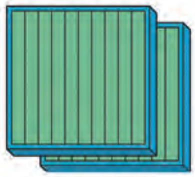
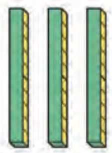


2 sets of 100 is two hundred.
Two hundred, thirty and five is called **two hundred and thirty five** and it is written as **235**.

100s	10s	1s
Hundreds place	Tens place	Ones place
		
two hundred	thirty	five
2	3	5

21 How many  are there altogether?

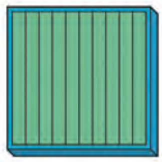
①

100s	10s	1s
Hundreds place	Tens place	Ones place
		

100s	10s	1s
Hund-reds	Tens	Ones

The number when two hundred and thirty are added together.

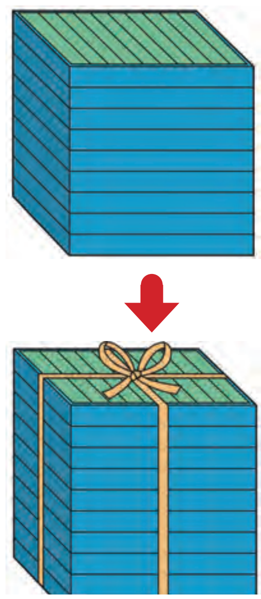
②

100s	10s	1s
Hundreds place	Tens place	Ones place
		

100s	10s	1s
Hund-reds	Tens	Ones

The number when one hundred and five are added together.

22 Each box contains 100  each.



① How many  are there altogether in 9 boxes of 100.

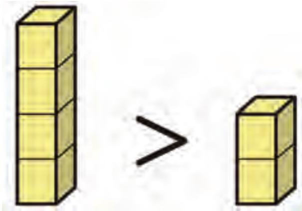
② When one more box of 100 is added, there will be 10 boxes. How many  are there altogether?

The sum of 10 sets of 100 is called a **thousand** and is written as **1000**.

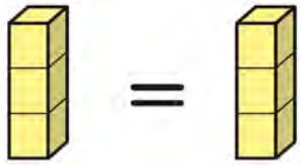
1	0	0	0

How much larger is 1000 than 999?

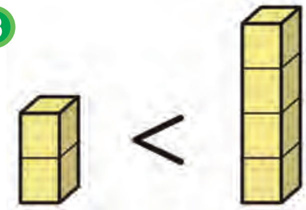
23 Let's compare the sizes of the numbers.

1 

4 > 2

2 

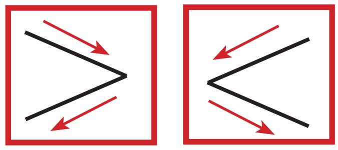
3 = 3

3 

2 < 4

4 is ☐ than 2. 3 is the ☐ size as 3. 2 is ☐ than 4.

> and < are signs to represent larger than and smaller than for comparing sizes. When the size is the same, = is used.

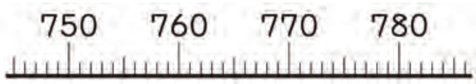


24 Which number is larger? Please represent it by using either > or <.

1 495 $\boxed{<}$ 519

100s	10s	1s
Hund-reds	Tens	Ones
4	9	5
5	1	9

2 769 ☐ 764



100s	10s	1s
Hund-reds	Tens	Ones

3 238 ☐ 253

100s	10s	1s
Hund-reds	Tens	Ones

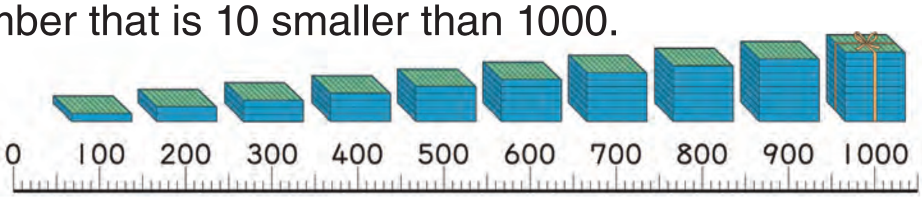
25 Let's write down the following numbers.

1 The number that is 300 larger than 500.

2 The number that is 200 smaller than 700.

3 The number that is 10 larger than 900.

4 The number that is 10 smaller than 1000.



Exercise

1 Let's read the following numbers.

① 826 ② 160 ③ 408 ④ 505 ⑤ 900

2 Let's write the following numbers.

① seven hundred and forty ② eight hundred and sixty

③ one hundred and twenty ④ five hundred and eight

⑤ one hundred and one ⑥ six hundred

3 Let's fill in each $\square$ with a number.

① 1000 is the sum of $\square$ sets of 10.

② 1000 is the sum of $\square$ sets of 100.

③ The number when two hundred, fifty and four added together is $\square$.

④ The number when 3 sets of 100, 8 sets of 1 added together is $\square$.

4 Which number is larger? Use > or < .

① 312 $\square$ 321 ② 602 $\square$ 598 ③ 880 $\square$ 808

5 Let's fill in each $\square$ with a number.

213 – 214 – 215 – $\square$ – 217 – $\square$ – 219 – $\square$

470 – 480 – $\square$ – $\square$ – 510 – 520 – 530 – $\square$

6 Let's look at 480 and fill each $\square$ with a number.

① 4 in the hundreds place means that 4 is the value of $\square$.

② 480 is the sum of $\square$ sets of 10.

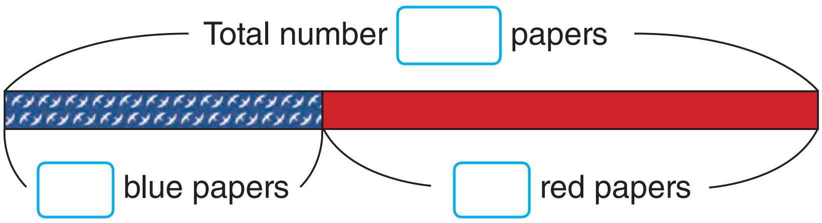
③ The number that is 20 more than 480 is $\square$.

Addition or Subtraction

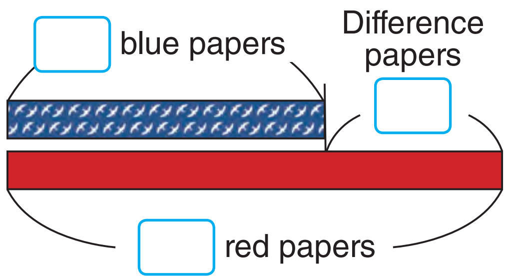
26 Write a mathematical expression and solve it based on each tape diagram. There are 9 blue papers and 14 red papers.

1. How many papers are there in total?

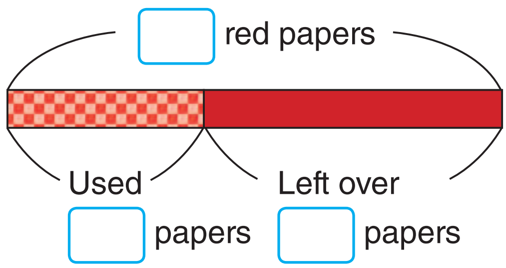
Remember.
This is a **tape diagram**



2. Which colour is more and by how many?



3. 4 red papers are used. How many red papers are left?



1. Which type of tape diagram can tell the story well? Choose a diagram above 1, 2 and 3.

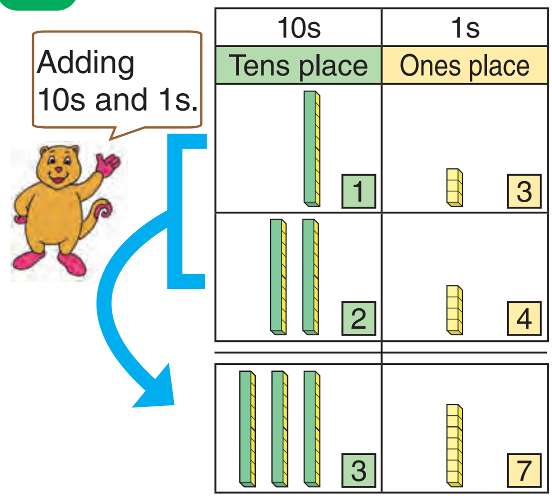
① There are 12 red marbles and 14 blue marbles. How many marbles are there in total?

② Jane picked 18 beautiful stones. Teacher picked up 4 more than Jane. How many stones did the teacher have?

③ Hilda had 21 stickers. She gave some to her friend and she is left with 16 for herself. How many stickers did she give to her friend?

Addition in Vertical Form 1

27 Find the answers '13 + 24' using vertical form.



How to Add 13 + 24 using Vertical Form

$$\begin{array}{r} 13 \\ +\,24 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ +\,24 \\ \hline 37 \end{array}$$

1 + 2 = 3　　3 + 4 = 7

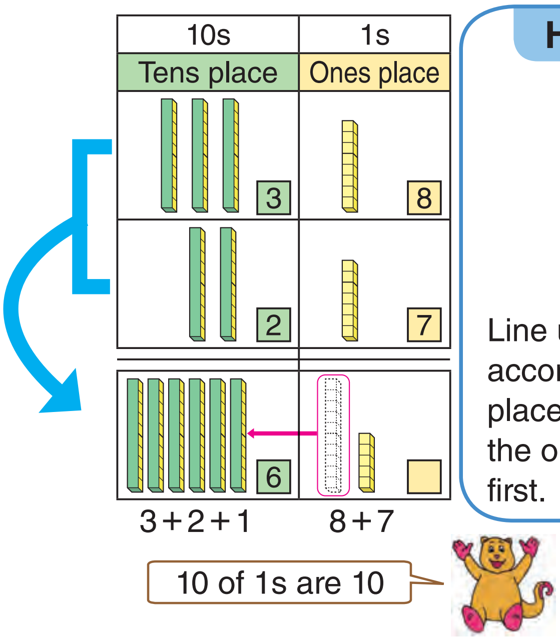
Line up numbers according to their place value.

Add numbers in the ones place, then numbers in the tens place.

❶ Find the answers using vertical form.

① 31 + 57　　② 18 + 40　　③ 50 + 36　　④ 20 + 70

28 Find the answers '38 + 27' using vertical form.



How to Add 38 + 27 using Vertical Form

Ones place　　Tens plaece

$$\begin{array}{r} 38 \\ +\,27 \\ \hline \end{array} \rightarrow \begin{array}{r} 38 \\ +\,\overset{1}{2}7 \\ \hline 5 \end{array} \rightarrow \begin{array}{r} 38 \\ +\,\overset{1}{2}7 \\ \hline 65 \end{array}$$

Line up numbers according to their place value. Add the ones place first.

8 + 7 = 15 The ones place is ☐. Carry 1 ten to the tens place.

1 ten was carried so 3 + 2 + 1 = 6. The tens place is ☐.

❶ Find the answers using vertical form.

① 14 + 29　　② 28 + 16　　③ 59 + 36

④ 72 + 18　　⑤ 56 + 4　　⑥ 8 + 44

29 Find the mistake and explain the reason.

❶ $$\begin{array}{r} 27 \\ +\,65 \\ \hline 82 \end{array}$$

❷ $$\begin{array}{r} 56 \\ +\,3 \\ \hline 8 \end{array}$$

Homework

1 Let's add in vertical form. Before addition, please see the numbers if the addition has carrying over or not.

① $\begin{array}{r} 26 \\ +43 \\ \hline \end{array}$ ② $\begin{array}{r} 47 \\ +27 \\ \hline \end{array}$ ③ $\begin{array}{r} 7 \\ +82 \\ \hline \end{array}$ ④ $\begin{array}{r} 15 \\ +56 \\ \hline \end{array}$ ⑤ $\begin{array}{r} 43 \\ +38 \\ \hline \end{array}$

⑥ $\begin{array}{r} 91 \\ +43 \\ \hline \end{array}$ ⑦ $\begin{array}{r} 77 \\ +\ \ 9 \\ \hline \end{array}$ ⑧ $\begin{array}{r} 82 \\ +\ \ 7 \\ \hline \end{array}$ ⑨ $\begin{array}{r} 15 \\ +\ \ 5 \\ \hline \end{array}$ ⑩ $\begin{array}{r} 35 \\ +45 \\ \hline \end{array}$

⑪ $\begin{array}{r} 31 \\ +60 \\ \hline \end{array}$ ⑫ $\begin{array}{r} 28 \\ +63 \\ \hline \end{array}$ ⑬ $\begin{array}{r} 20 \\ +17 \\ \hline \end{array}$ ⑭ $\begin{array}{r} 19 \\ +18 \\ \hline \end{array}$ ⑮ $\begin{array}{r} 18 \\ +19 \\ \hline \end{array}$

2 Mary has 27 flowers. James gave 65 flowers to Mary. How many flowers does Mary have?

3 Let's make an addition story for 56 + 3.

4 Before adding in vertical form, please predict which answer will be larger? Confirm your prediction if it is appropriate or not by using vertical form.

① 18 + 19, 21 + 9 ② 39 + 27, 40 + 30 ③ 25 + 48, 30 + 40

Let's develop T-Math for addition of two-digit numbers as follows.

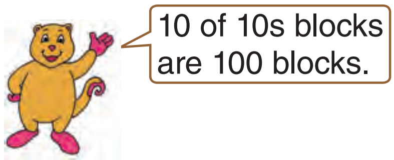
T-Math Addition		Addends												
		34	35	36	37	38	39	54	55	56	57	58	59	66
Augends	43													
	44													
	45													
	46													

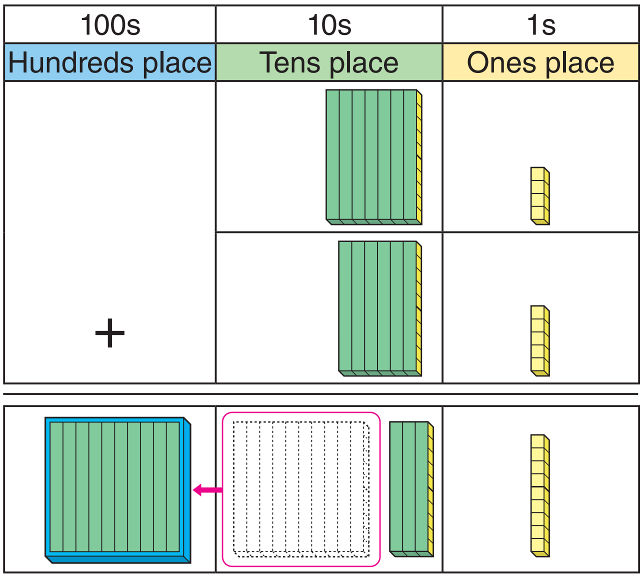
5 Let's work together with friends and fill in each space.

Addition in Vertical Form 2

30 Explain the way of calculating this vertical addition using the block diagram.

$$\begin{array}{rrr} & 7 & 4 \\ + & 6 & 5 \\ \hline 1 & 3 & 9 \end{array}$$



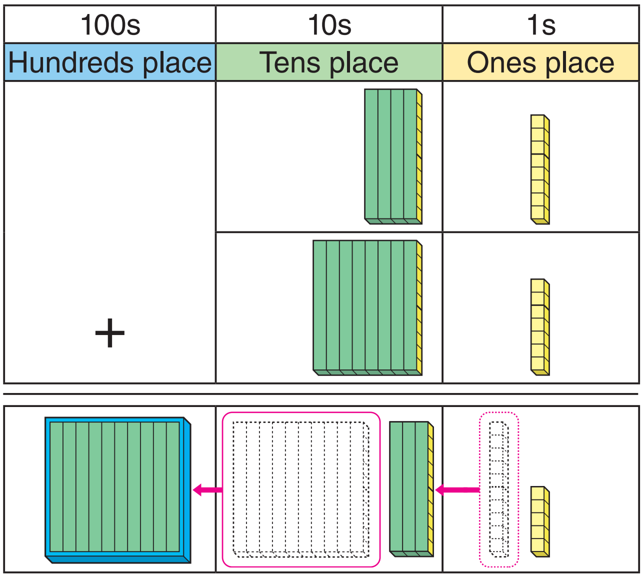


31 Add in vertical form.

① 93 + 86 ② 63 + 71 ③ 67 + 80 ④ 20 + 90

32 Explain each vertical form using block diagram.

$$\begin{array}{rrr} & 4 & 8 \\ + & 8 & 7 \\ \hline & {\scriptstyle 1} & \\ 1 & 3 & 5 \end{array} \qquad \begin{array}{rrrr} & & 4 & 8 \\ + & & 8 & 7 \\ \hline & & 1 & 5 \\ & 1 & 2 & \\ \hline & 1 & 3 & 5 \end{array}$$



33 Let's add in vertical form.

① 35 + 96 ② 58 + 62 ③ 27 + 78 ④ 15 + 85

⑤ 6 + 97 ⑥ 100 + 400 ⑦ 100 + 900 ⑧ 345 + 7

⑨ 463 + 29 ⑩ 616 + 66 ⑪ 748 + 43

Homework

1 Let's add in vertical form. Before addition, please think how many times carrying over will happen in the process of addition.

① $\begin{array}{r} 88 \\ +\ 44 \\ \hline \end{array}$ ② $\begin{array}{r} 36 \\ +\ 89 \\ \hline \end{array}$ ③ $\begin{array}{r} 32 \\ +\ 69 \\ \hline \end{array}$ ④ $\begin{array}{r} 200 \\ +\ 600 \\ \hline \end{array}$ ⑤ $\begin{array}{r} 600 \\ +\ 400 \\ \hline \end{array}$

⑥ $\begin{array}{r} 286 \\ +\quad 4 \\ \hline \end{array}$ ⑦ $\begin{array}{r} 121 \\ +\quad 9 \\ \hline \end{array}$ ⑧ $\begin{array}{r} 36 \\ +\ 32 \\ \hline \end{array}$ ⑨ $\begin{array}{r} 500 \\ +\ 500 \\ \hline \end{array}$ ⑩ $\begin{array}{r} 325 \\ +\ \ 35 \\ \hline \end{array}$

2 Let's find easier ways of calculation.

① $56+22+8$ ② $54+32+26$

3 Let's add in vertical form and confirm the answer using calculator.

① $\begin{array}{r} 23 \\ 35 \\ +\ 41 \\ \hline \end{array}$ ② $\begin{array}{r} 27 \\ 33 \\ +\ 20 \\ \hline \end{array}$ ③ $\begin{array}{r} 30 \\ 20 \\ 10 \\ +\quad 7 \\ \hline \end{array}$

4 When do you prefer to use calculator for adding and when not?

5 Let's develop T-Math for addition of two-digit numbers as follows.

T-Math Addition		Addends												
		34	35	36	37	38	39	54	55	56	57	58	59	66
Augends	63													
	64													
	65													
	66													

6 Let's work together with friends and fill in each space.

Subtraction in Vertical Form 1

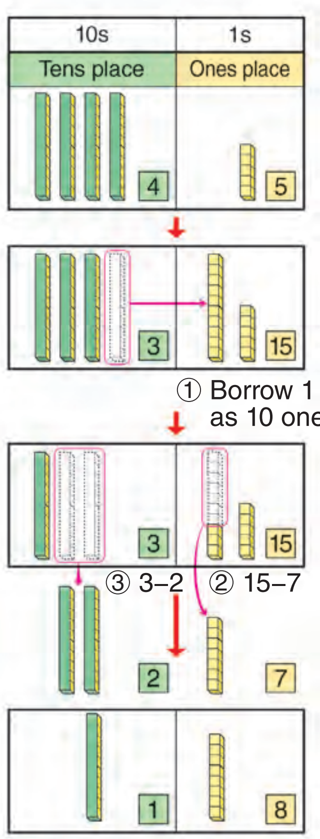
34 Let's find the answers in vertical form.

① 76 − 32 ② 56 − 40 ③ 58 − 5

④ 98 − 18 ⑤ 43 − 42 ⑥ 30 − 20

35 Let's explain subtraction in vertical form using block diagram.

$$\begin{array}{r|c|c} & 4 & 5 \\ - & 2 & 7 \\ \hline & & \end{array}$$



Can we remove 7 blocks from 5 blocks? What shall we do?

Step 1.
Borrow 1 ten as 10 ones.

Step 2.
7 blocks remove from 15 blocks at 1s place.
Step 3.
Two 10s remove from three 10s at 10s place.

How to Subtract 45 − 27 Using Vertical Form

	Ones place	Tens place
$\begin{array}{rcc} & 4 & 5 \\ - & 2 & 7 \\ \hline & & \end{array}$	$\begin{array}{rcc} & {}^{3}\cancel{4} & {}^{10}5 \\ - & 2 & 7 \\ \hline & & 8 \end{array}$	$\begin{array}{rcc} & {}^{3}\cancel{4} & {}^{10}5 \\ - & 2 & 7 \\ \hline & 1 & 8 \end{array}$
Line up numbers in each column.	Borrow 1 ten as 10 ones, so 15 − 7 = 8 The ones place of the answer becomes ☐.	1 ten has been borrowed by the ones place. So 3 − 2 = ☐.

Yes, finally we have an answer 18 as one of tens blocks and 8 of 1s blocks.

36 Let's find the answers in vertical form.

① 41 − 19 ② 70 − 56 ③ 26 − 18

④ 90 − 88 ⑤ 92 − 8 ⑥ 40 − 7

1 Let's subtract in vertical form. Before subtraction, please check the necessity of borrowing.

① $\begin{array}{r} 59 \\ -\ 45 \\ \hline \end{array}$ ② $\begin{array}{r} 70 \\ -\ 23 \\ \hline \end{array}$ ③ $\begin{array}{r} 53 \\ -\ 26 \\ \hline \end{array}$ ④ $\begin{array}{r} 45 \\ -\ \ 5 \\ \hline \end{array}$ ⑤ $\begin{array}{r} 72 \\ -\ 33 \\ \hline \end{array}$

⑥ $\begin{array}{r} 81 \\ -\ 16 \\ \hline \end{array}$ ⑦ $\begin{array}{r} 66 \\ -\ 28 \\ \hline \end{array}$ ⑧ $\begin{array}{r} 40 \\ -\ 24 \\ \hline \end{array}$ ⑨ $\begin{array}{r} 50 \\ -\ 33 \\ \hline \end{array}$ ⑩ $\begin{array}{r} 58 \\ -\ 32 \\ \hline \end{array}$

⑪ $\begin{array}{r} 51 \\ -\ \ 9 \\ \hline \end{array}$ ⑫ $\begin{array}{r} 54 \\ -\ 45 \\ \hline \end{array}$ ⑬ $\begin{array}{r} 40 \\ -\ 24 \\ \hline \end{array}$ ⑭ $\begin{array}{r} 39 \\ -\ 23 \\ \hline \end{array}$ ⑮ $\begin{array}{r} 38 \\ -\ 22 \\ \hline \end{array}$

2 There are 32 children in Michelle's class.

3 of them are absent today. How many are present?

3 Let's make subtraction stories for $42-39$.

Before subtracting in vertical form, please predict which answer will be larger? Confirm your prediction if it is correct or not by using vertical form.

① $74-31$, $40-30$ ② $30-17$, $33-14$ ③ $87-59$, $90-60$

4 Let's develop T-Math for subtraction of two-digit numbers.

T-Math Subtraction		**Subtrahends**												
		34	35	36	37	38	39	54	55	56	57	58	59	62
Minuends	63													
	64													
	65													
	66													

5 Let's work together with friends and fill in each space.

Subtraction in Vertical Form 2

37 Explain subtraction in vertical form with borrowing.

①

$$\begin{array}{rccc} & 1 & 2 & 9 \\ - & & 7 & 3 \\ \hline & & & \end{array}$$

↓

$$\begin{array}{rccc} & 1 & 2 & 9 \\ - & & 7 & 3 \\ \hline & & & 6 \end{array}$$

↓

$$\begin{array}{rccc} & & 10 & \\ & \cancel{1} & 2 & 9 \\ - & & 7 & 3 \\ \hline & & 5 & 6 \end{array}$$

②

$$\begin{array}{rccc} & 1 & 2 & 5 \\ - & & 8 & 6 \\ \hline & & & \end{array}$$

↓

$$\begin{array}{rccc} & & 1 & 10 \\ & 1 & \cancel{2} & 5 \\ - & & 8 & 6 \\ \hline & & & 9 \end{array}$$

↓

$$\begin{array}{rccc} & & 10 & \\ & & 1 & 10 \\ & \cancel{1} & \cancel{2} & 5 \\ - & & 8 & 6 \\ \hline & & \boxed{} & 9 \end{array}$$

③

$$\begin{array}{rccc} & 1 & 0 & 0 \\ - & & 7 & 8 \\ \hline & & & \end{array}$$

↓

$$\begin{array}{rccc} & & 9 & \\ & & \cancel{10} & 10 \\ & \cancel{1} & \cancel{0} & 0 \\ - & & 7 & 8 \\ \hline & & & \end{array}$$

↓

$$\begin{array}{rccc} & & 9 & \\ & & \cancel{10} & 10 \\ & \cancel{1} & \cancel{0} & 0 \\ - & & 7 & 8 \\ \hline & & \boxed{} & 2 \end{array}$$

38 Find the answers in vertical form.

1. 132 − 41
2. 109 − 53
3. 146 − 60
4. 132 − 47
5. 120 − 61
6. 106 − 59
7. 105 − 58
8. 100 − 39
9. 102 − 17
10. 102 − 7
11. 900 − 500
12. 1000 − 200
13. 536 − 5

39 Find the appropriate number in each box.

①

$$\begin{array}{rcc} & \square & 8 \\ - & 2 & \square \\ \hline & 6 & 4 \end{array}$$

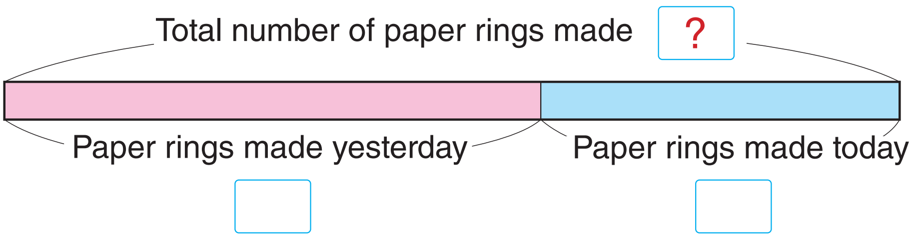
②

$$\begin{array}{rcc} & 8 & \square \\ - & \square & 9 \\ \hline & 5 & 8 \end{array}$$

2 Addition and Subtraction 2

1 Addition of 3-digit Numbers

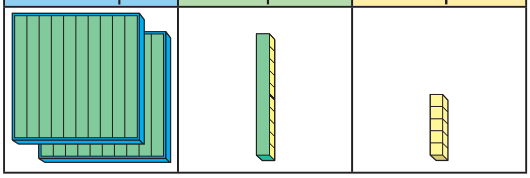
1 For the party decoration, we made 215 paper rings yesterday and 143 rings today.
How many paper rings did we make altogether?



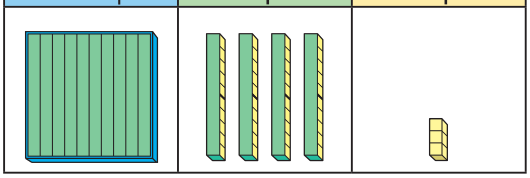
1. Write a mathematical expression.
2. Approximately how many paper rings is the answer?

Let's remember the additions in 2nd grade to think of how to do this.

3. Let's think about how to add three-digit numbers.

100s Hundreds place	10s Tens place	1s Ones place
		

+

100s Hundreds place	10s Tens place	1s Ones place
		

Activity

Let's think about how to add.

Naiko's idea

Line up place values, then put in numbers accordingly.

100s Hundreds place	10s Tens place	1s Ones place
2	1	5
1	4	3
3	5	8
2 + 1 for the sets of 100s.	1 + 4 for the sets of 10s.	5 + 3 for the ones.

Yamo's idea

Calculate the addition vertically like the addition of 2-digit numbers.

$$\begin{array}{r} 215 \\ +\,143 \\ \hline 358 \end{array}$$

Addition Algorithm for 215 + 143 in Vertical Form

$$\begin{array}{r} 215 \\ +\,143 \\ \hline \end{array} \qquad \begin{array}{r} 215 \\ +\,143 \\ \hline 358 \end{array}$$

Vertically line up the numbers according to their place values.

2+1=3 1+4=5 5+3=8

For adding large numbers vertically, we line up the numbers according to their place values.

Exercise

① 153 + 425 ② 261 + 637 ③ 437 + 302 ④ 502 + 205

2 Let's think about how to add 238 + 546 in vertical form.

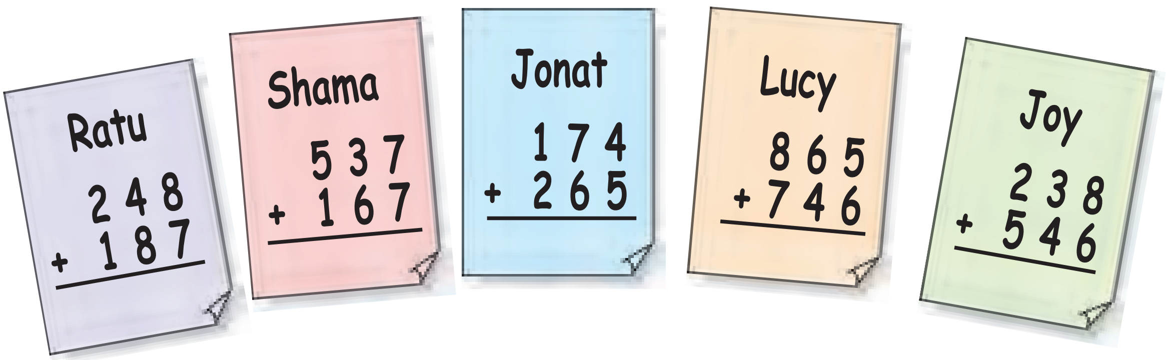
How is it different to 215 + 143?

	2	3	8
+	5	4	6

3 Let's think about the students' vertical additions below.

① Whose problems do you have to carry over once?

② Whose problems do you have to carry over twice?



Let's think about how to calculate.

Activity

4 Let's write numbers in □ to make addition problems for 3-digit numbers.

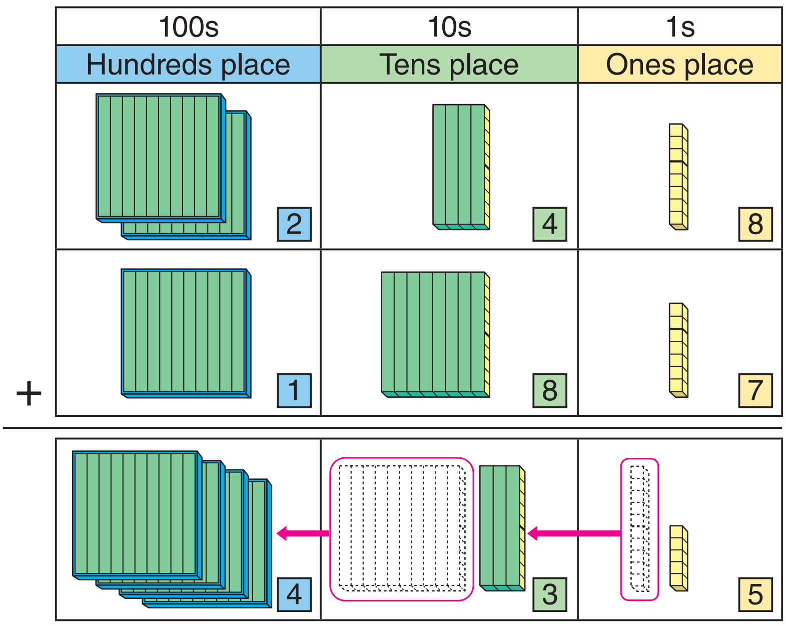
	□	□	□
+	□	□	□

5 Let's think about how to add 174 + 265 in vertical form.

On which place values do we carry?

$$\begin{array}{cccc} & 1 & 7 & 4 \\ + & 2 & 6 & 5 \\ \hline & & & \end{array}$$

6 Let's explain how to add 248 + 187 in vertical form.



$$\begin{array}{cccc} & 2 & 4 & 8 \\ + & 1 & 8 & 7 \\ \hline & & & 5 \end{array}$$

$$\begin{array}{cccc} & & 1 & \\ & 2 & 4 & 8 \\ + & 1 & 8 & 7 \\ \hline & & 3 & 5 \end{array}$$

$$\begin{array}{cccc} & 1 & 1 & \\ & 2 & 4 & 8 \\ + & 1 & 8 & 7 \\ \hline & 4 & 3 & 5 \end{array}$$

Do not forget to write down the number you carry. You should write a small 1.

Step 3 ←	**Step 2** ←	**Step 1**
100s	**10s**	**1s**
Carry 1 to the Hundreds place. 2 + 1 + 1	Carry 1 to the tens place. 4 + 8 + 1	8 + 7

When adding large numbers in a vertical form, the best way is to start adding from the ones place value to the most superior which means higher place value.

$$\begin{array}{r} 537 \\ +\ 167 \\ \hline \end{array}$$

7 Let's think about how to add 537 + 167 in vertical form. Also, try calculating after switching the addend and augends, and check whether the answer is correct.

Remember
537 + 167
Augend Addend

For addition, we calculate in vertical form as follows.

① Calculate the numbers in the same place value.

② When the sum is 10 and greater you carry up the number in the place to the next superior place and calculate.

Using this method, we can add any large numbers!

8 Let's make the addition problems of 3-digit numbers which have answer of 653 with the following condition;

$$\begin{array}{r} \square\square\square \\ +\ \square\square\square \\ \hline 653 \end{array}$$

❶ Carry over once ❷ Carry over twice

8 ① When the ones place carries up

First, to calculate the ones place; find 2 numbers which add up to 13.

4 and 9, 5 and 8, 6 and 7

Next, to calculate the tens place, due to the round up from the ones place, find two numbers which add up to 4.

0 and 4, 1 and 3, 2 and 2

Then, to calculate the hundreds place, find two numbers which add to 6.

1 and 5, 2 and 4, 3 and 3

If you use words like 'first', 'next', and 'then', it is smart.

Activity

Let's continue your answer in your exercise book.

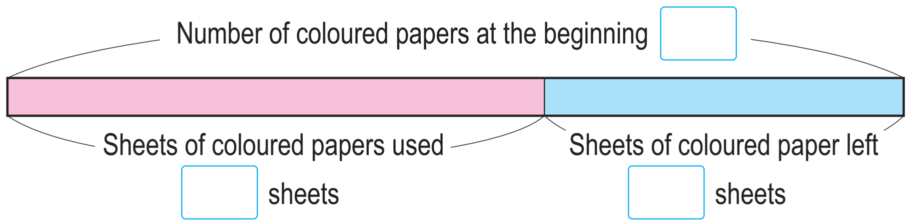
Exercise

① 145 + 438 ② 305 + 607 ③ 293 + 186 ④ 360 + 280

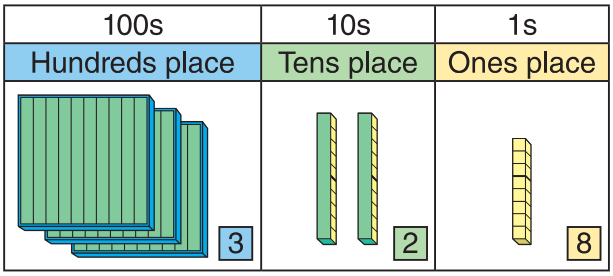
⑤ 422 + 91 ⑥ 335 + 196 ⑦ 427 + 378 ⑧ 215 + 485

2 Subtraction of 3-digit Numbers

1 There were 328 sheets of coloured papers. For the party decoration, 215 sheets of coloured papers were used. How many sheets of coloured papers are left?



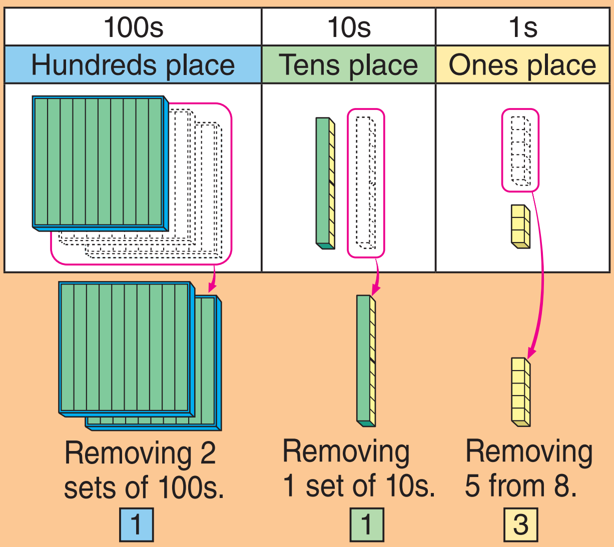
1. Write a mathematical expression.
2. Approximately how many sheets of coloured papers is the answer?
3. Let's think about how to calculate.



Are there more than 100 sheets of papers left?

Kekeni's idea $328 - 215$

I used paper blocks and removed the numbers on same place values.



$328 - 215 = 113$

Gawi's idea

I subtracted using vertical form as we did subtraction of 2-digit numbers.

$$\begin{array}{cccc} & 3 & 2 & 8 \\ - & 2 & 1 & 5 \\ \hline & 1 & 1 & 3 \end{array}$$

Which ideas do you like? Compare and discuss.

I think their ideas are similar because...

Activity

Subtraction Algorithm for 328 − 215 in Vertical Form

$$\begin{array}{r} 3\,2\,8 \\ -\,2\,1\,5 \\ \hline \end{array}$$

Vertically line up the numbers according to their place values.

$$\begin{array}{r} 3\,2\,8 \\ -\,2\,1\,5 \\ \hline 1\,1\,3 \end{array}$$

3−2=1　2−1=1　8−5=3

For subtracting large numbers in vertical form, we line up the numbers according to their place values.

Exercise

① 768 − 534　② 879 − 412　③ 647 − 317　④ 965 − 864

2 Let's think about how to subtract in vertical form.

❶ 692 − 458

	5	9	2
−	4	5	8

❷ 329 − 173

	3	2	9
−	1	7	3

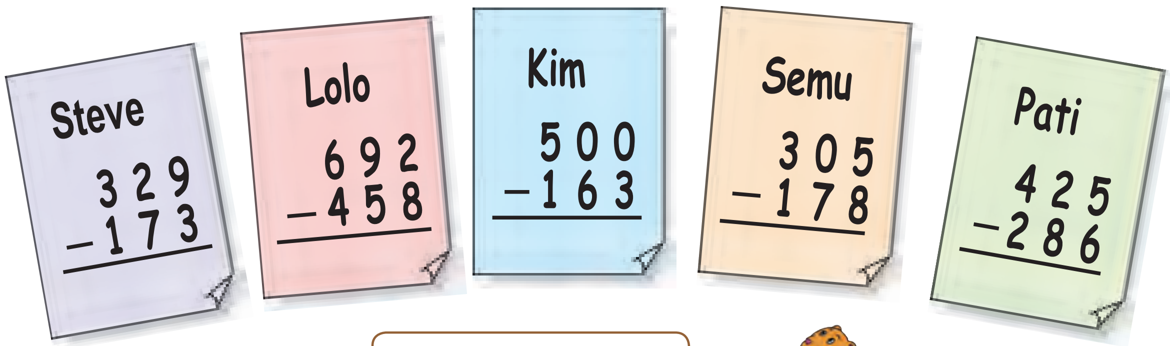
On which place values are numbers borrowed?

3 Let's think about the students' vertical subtractions below.

❶ Whose problem do you have to borrow once?

❷ Whose problem do you have to borrow twice?

❸ Whose problem do you have to borrow from the hundreds?



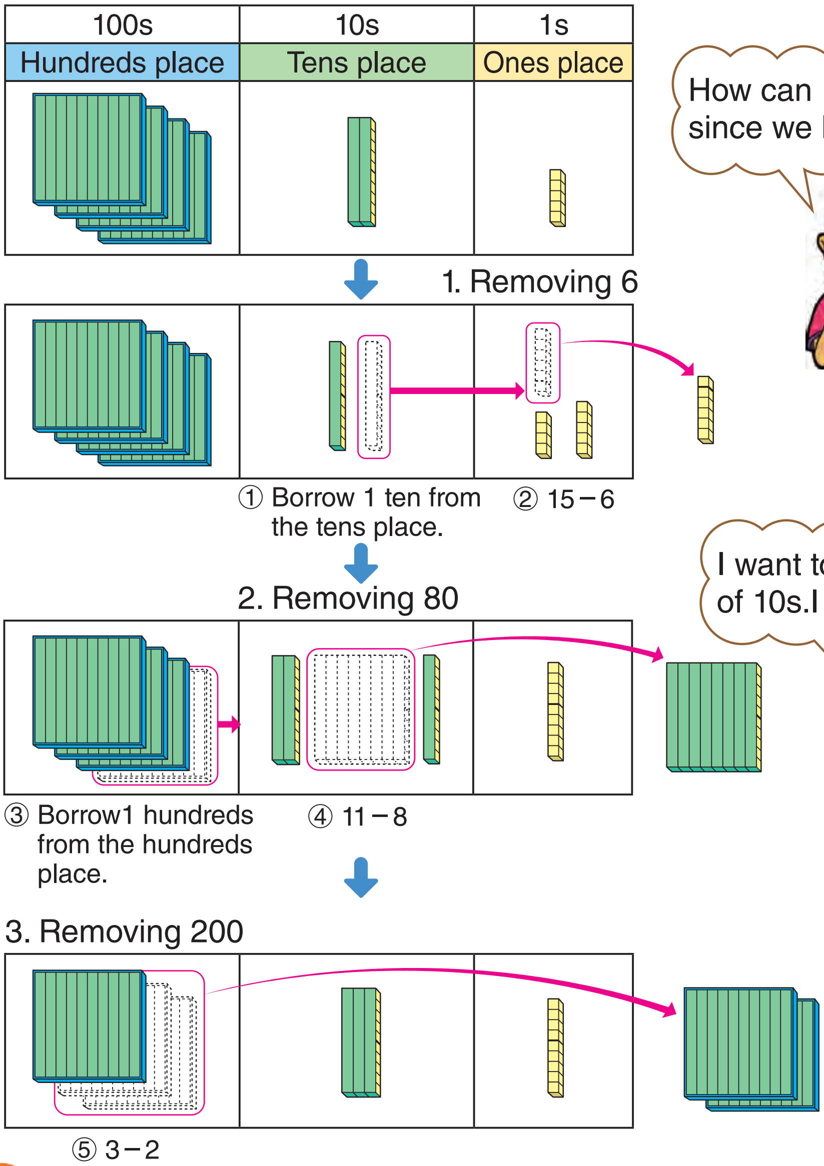
Let's think about how to calculate.

Activity

4 Let's write numbers in the ☐ to make subtraction problems for 3-digit numbers.

$$\begin{array}{r} \square\square\square \\ -\ \square\square\square \\ \hline \end{array}$$

5 Let's think about how to subtract 425 − 286 in vertical form.



$$\begin{array}{r} 4\ 2\ 5 \\ -\ 2\ 8\ 6 \\ \hline \end{array}$$

$$\begin{array}{r} {}^{1}\ {}^{10} \\ 4\ 2\ 5 \\ -\ 2\ 8\ \boxed{6} \\ \hline \end{array}$$

$$\begin{array}{r} {}^{10} \\ {}^{3}\ {}^{1}\ {}^{10} \\ \cancel{4}\ \cancel{2}\ 5 \\ -\ 2\ \boxed{8}\ 6 \\ \hline \square\ 9 \end{array}$$

8 tens (80)

$$\begin{array}{r} {}^{10} \\ {}^{3}\ {}^{1}\ {}^{10} \\ \cancel{4}\ \cancel{2}\ 5 \\ -\ \boxed{2}\ 8\ 6 \\ \hline \square\ 3\ 9 \end{array}$$

2 hundreds (200)

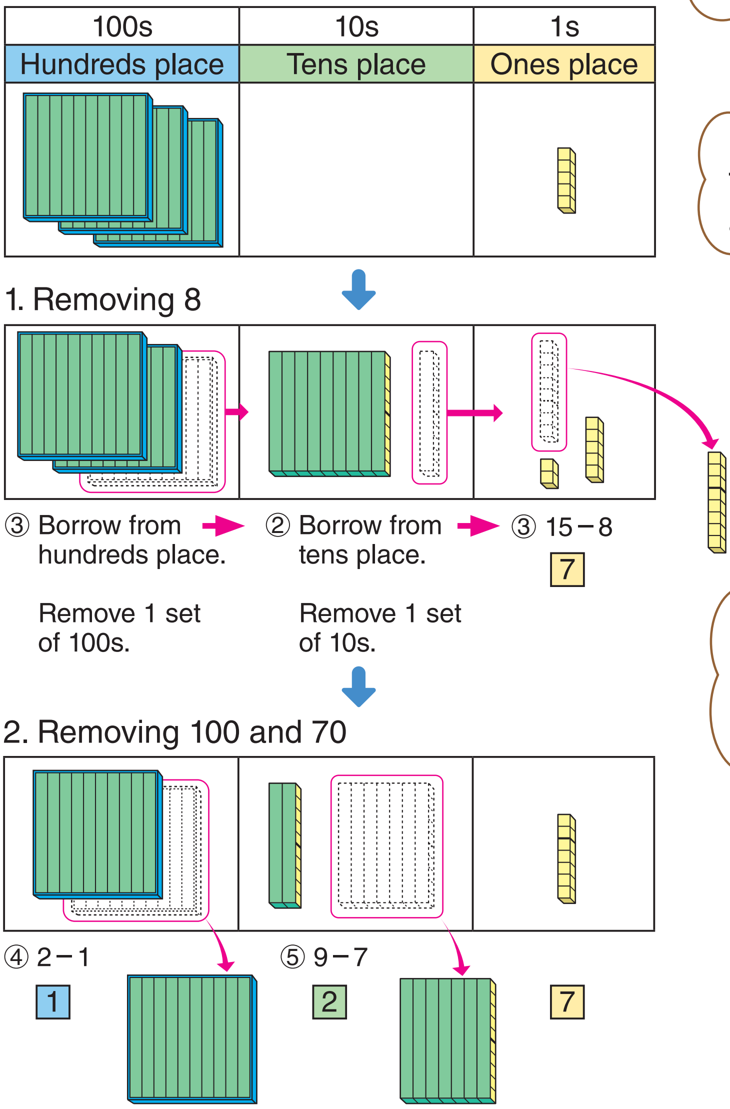
When we subtract large numbers in vertical form, the best way is to start subtracting from the ones place value to the superior.

Exercise

① 363 − 114 ② 540 − 513 ③ 825 − 451 ④ 526 − 483

⑤ 424 − 185 ⑥ 821 − 373 ⑦ 510 − 176 ⑧ 242 − 64

6 Let's explain how to subtract 305 – 178 in vertical form.



How should we subtract 8?

$$\begin{array}{cccc} & 3 & 0 & 5 \\ - & 1 & 7 & 8 \\ \hline & & & \end{array}$$

See 305.
There is no 10s at tens place.

$$\begin{array}{cccc} & 2 & \overset{9}{\cancel{10}} & 10 \\ & \cancel{3} & 0 & 5 \\ - & 1 & 7 & 8 \\ \hline & & & 7 \end{array}$$

I need more ones and 10s. I have to borrow from hundreds and tens.

$$\begin{array}{cccc} & 2 & \overset{9}{\cancel{10}} & 10 \\ & \cancel{3} & 0 & 5 \\ - & 1 & 7 & 8 \\ \hline & \square & \square & 7 \end{array}$$

7 Let's explain how to subtract 500 – 163 in vertical form.

For subtraction, we calculate using vertical form as follows.

① Calculate the numbers on the same place value.

② When you cannot subtract, borrow from the superior places and calculate.

If you use these methods, you can subtract any larger number!

8 Let's make the subtraction of 3-digit numbers with the answers as 356 using the following conditions.

$$\begin{array}{r} \square\,\square\,\square \\ -\ \square\,\square\,\square \\ \hline 3\ \ 5\ \ 6 \end{array}$$

❶ Borrowing once　　❷ Borrowing twice

8 ① When we cannot subtract from ones place.

First, to calculate the ones place borrow from the tens place, so there will be 2 numbers on ones place which becomes 6 after subtraction.

5 and 9, 4 and 8, 3 and 7, 2 and 6, or 1 and 5.

Next, to calculate the tens place, remember the number 1 which was borrowed for the ones place. It means finding 2 numbers on the tens place which become 6 after subtraction.

6 and 0, 7 and 1, 8 and 2, or 9 and 3.

Then, to calculate the hundreds place, find 2 numbers which become 3 after subtraction.

Just think in order, just like addition!

Let's continue your answer in your exercise book.

Exercise

① 405 − 286　② 601 − 198　③ 402 − 107　④ 702 − 46

⑤ 800 − 197　⑥ 200 − 38　⑦ 700 − 403　⑧ 600 − 9

Activity

3 Calculating Larger Numbers

1 Let's explain how to calculate using the carrying over and borrowing.

① 865 + 746

	8	6	5
+	7	4	6

② 1248 − 936

	1	2	4	8
−		9	3	6

③ 1000 − 895

	1	0	0	0
−		8	9	5

2 Let's think about how to calculate larger numbers using what you already learned.

① 4175 + 3658

	4	1	7	5
+	3	6	5	8

② 6073 + 3927

	6	0	7	3
+	3	9	2	7

③ 3925 − 1947

	3	9	2	5
−	1	9	4	7

④ 10000 − 5089

	1	0	0	0	0
−		5	0	8	9

Exercise

① 525 + 913　② 258 + 745　③ 483 + 517

④ 1237 − 414　⑤ 1358 − 567　⑥ 1002 − 946

⑦ 4563 + 3125　⑧ 2606 + 3198　⑨ 3587 + 6413

⑩ 6497 − 2135　⑪ 8114 − 3518　⑫ 10000 − 6001

4 Considering How to Calculate More Easily

1 Let's calculate easily.

① 298 + 120 ② 500 − 198

[1] ① 298+120

When you add 2 to the augend and make 300, calculating becomes easier.

You added 2 to the augend, so you subtract 2 from the addend.

$$\begin{array}{ccc} 298 & + & 120 \\ \text{add } 2 \downarrow & & \downarrow \text{subtract } 2 \\ 300 & + & 118 = 418 \end{array}$$

Answer 418

[1] ② 500−198

When you add 2 to the subtrahend it becomes 200, calculating becomes easier.

You added 2 to the subtrahend, so you must also add 2 to the minuend.

$$\begin{array}{ccc} 500 & - & 198 \\ \text{add } 2 \downarrow & & \downarrow \text{add } 2 \\ 502 & - & 200 = 302 \end{array}$$

Answer 302

In addition, the answer does not change by adding a number to the augend and subtracting that same number from the addend.
In subtraction, the answer does not change by adding the same number to both the subtrahend and the minuend.

2 Using the idea in **1**, calculate the following problems easily.

① 308 + 197 ② 305 − 99

Exercise

① 499 + 350 ② 199 + 299 ③ 600 − 297 ④ 200 − 95

3 Let's think about how to calculate $875+47+53$.

When you are adding 3 numbers, the order of calculations does not change the answer.

$$(875+47)+53=875+(47+53)$$

The (   ) is a symbol that means you should calculate the numbers inside first.

Mental Calculations

4 Let's calculate mentally.

① $35+46$

Vavi's idea
Calculate in vertical form,
① $5+6=11$
② $3+4+1=8$
then 81.

Ambai's idea
① Split 46 to 40 and 6.
② $35+40=75$
③ $75+6=81$

② $81-27$

Sare's idea
Calculate in vertical form,
① $11-7=4$
② $7-2=5$
then 54.

Mero idea
① Split 27 to 20 and 7.
② $81-20=61$
③ $61-7=54$

Exercise

1 Let's calculate easily.

① $492+84+16$ ② $52+365+48$

2 Let's calculate mentally.

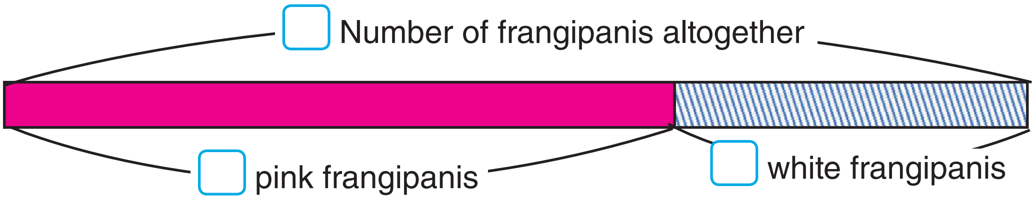
① $18+6$ ② $38+411$ ③ $68+291$ ④ $52+18$

⑤ $23-8$ ⑥ $45-24$ ⑦ $71-46$ ⑧ $90-76$

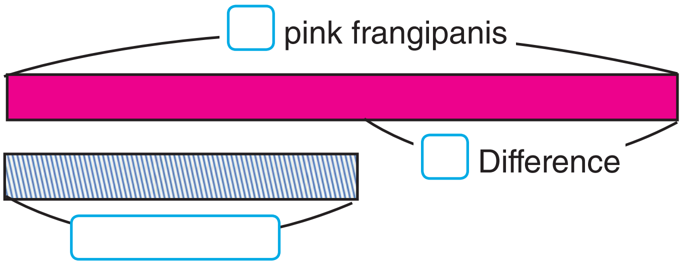
5 What Kind of Calculation is This?

1 There are 245 pink frangipanis and 138 white frangipanis that blossomed.

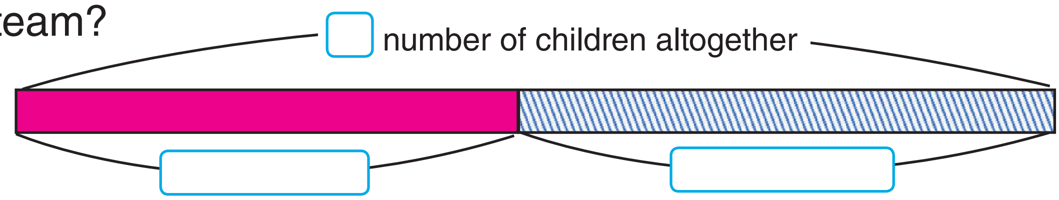
① How many frangipanis blossomed ?



② Which colour blossomed the most?



2 There are 605 children in Eileen's school. In a sports day, children are divided into red and blue teams. There are 298 children in the red team. How many children are in the blue team?



3 The 3A students gathered 118 dry coconuts.
The 3B students gathered 20 more dry coconuts than 3A students. How many dry coconuts did the 3B students gather?

Let's think about how to represent it in a diagram.

Exercise

1 Let's calculate in vertical form.

Pages 27 ~ 35

① 324 + 253　② 146 + 537　③ 473 + 261

④ 246 + 485　⑤ 354 + 249　⑥ 464 + 368

⑦ 658 − 325　⑧ 374 − 138　⑨ 546 − 369

⑩ 432 − 136　⑪ 604 − 247　⑫ 700 − 463

2 Let's calculate in vertical form.

Page 36

① 734 + 862　② 947 + 587　③ 457 + 546

④ 4137 + 1425　⑤ 2056 + 3794　⑥ 2361 + 7639

⑦ 1529 − 716　⑧ 1153 − 645　⑨ 1000 − 437

⑩ 3947 − 1925　⑪ 3142 − 1734　⑫ 10000 − 4005

3 Let's calculate.

Page 38

① 5387 + 57 + 43　② 26 + 3285 + 74

4 You read 165 pages of a book with 240 pages in total. How many pages are left?

Page 39

5 There are 2368 boys and 2356 girls in Elementary schools in Manus Province.

How many elementary school children are there in total? Also, which gender is more and by how many?

Page 39

Let's calculate.　Grade 2　Do you remember?

① 3×6　② 8×4　③ 6×9　④ 4×7

⑤ 9×1　⑥ 1×8　⑦ 5×3　⑧ 2×2

Problems

1 Let's calculate in vertical form.

● Understanding how to calculate in vertical form.

① 451 + 137	② 274 + 508	③ 662 + 150
④ 186 + 357	⑤ 109 + 698	⑥ 558 + 745
⑦ 3096 + 5518	⑧ 2048 + 1952	⑨ 6272 + 3728
⑩ 797 − 246	⑪ 258 − 139	⑫ 966 − 288
⑬ 653 − 399	⑭ 703 − 316	⑮ 1032 − 634
⑯ 2356 − 1848	⑰ 5126 − 2835	⑱ 10000 − 1781

2 In 2 years Cathy saved 3596 kina and her sister saved 4487 kina.

● Distinguish the situation for addition or subtraction and find the answer.

① Who has more savings and by how much?

② What is the total of their savings?

3 Let's find mistakes in the calculations done in vertical form and find the correct answers.

● Identifying the mistakes in calculations in vertical form and correcting.

$$\begin{array}{r} 294 \\ +\ 119 \\ \hline 403 \end{array} \qquad \begin{array}{r} 437 \\ -\ 198 \\ \hline 361 \end{array}$$

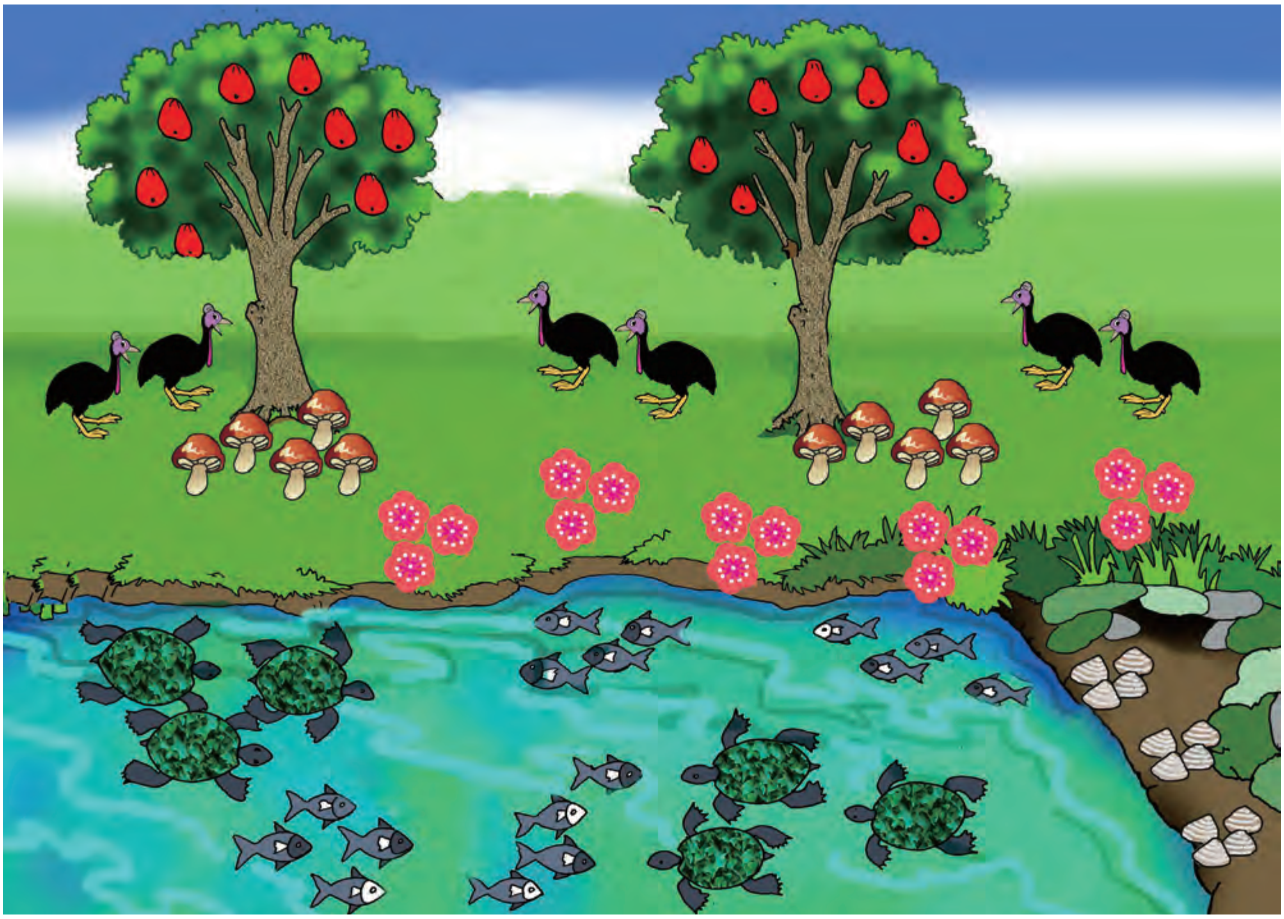
3

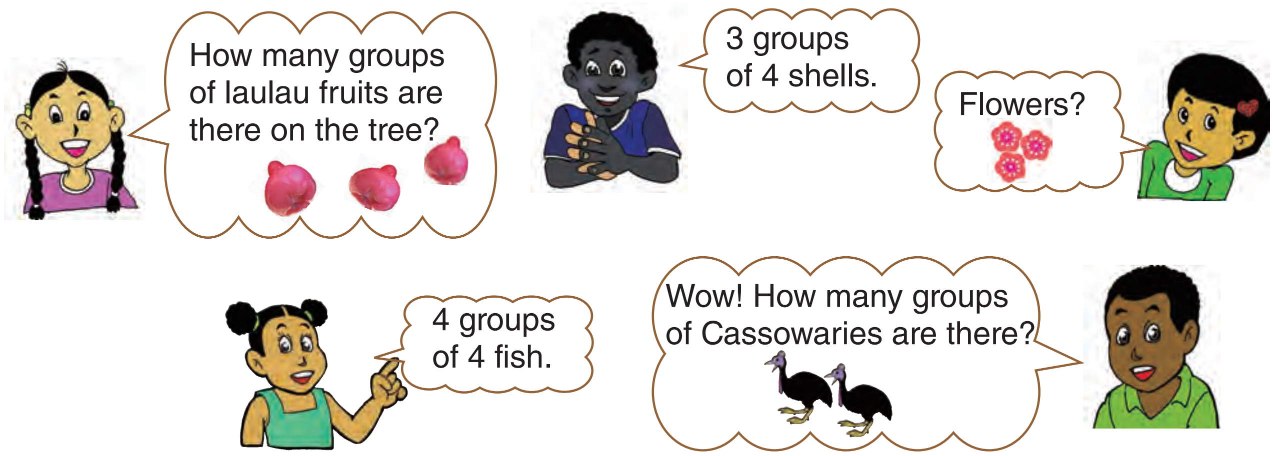
Multiplication 1

1 What We Learned in Elementary School

Meaning of Multiplication

1 Let's represent the situation by making a multiplication sentence.





5 boxes of 2 cakes each make 10 cakes.
This is written as $5 \times 2 = 10$ and read as "**5 multiplied by 2 equals 10**"

5	×	2	=	10
Number of boxes		Number of cakes for each box		Total Number

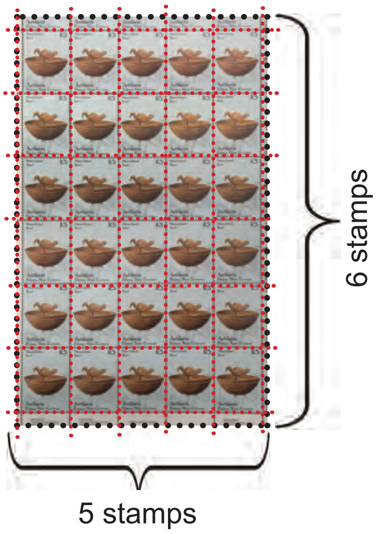
This kind of calculation is called **multiplication**.

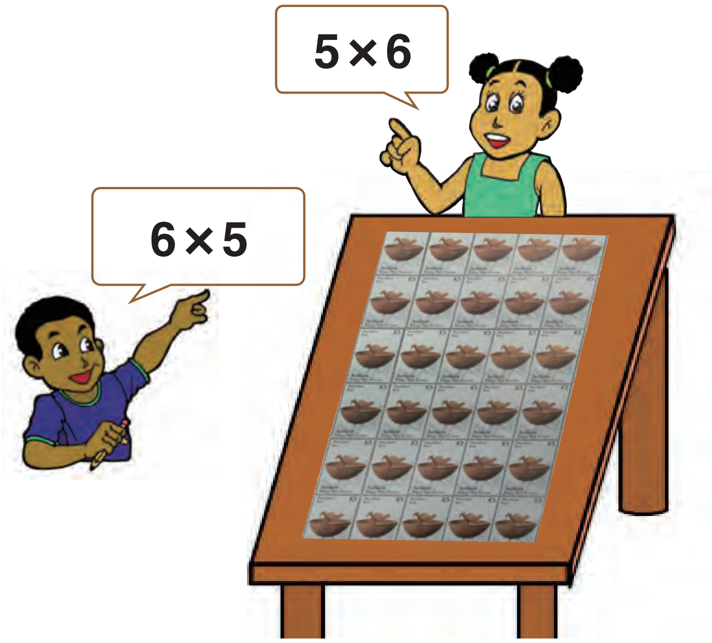
2 There are 2 oranges in each bag. How many oranges altogether in 1 bag, 2 bags and 3 bags?

1 bag	$1 \times 2 = 2$	2 oranges
2 bags	$\square \times 2 = \square$	$\square$ oranges
3 bags	$\square \times 2 = \square$	$\square$ oranges

3 Group the stars (★) to get 4×3.

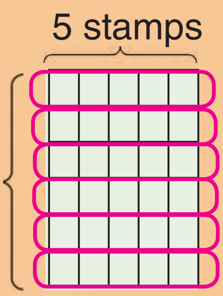
4 Naiko and Yamo found a sheet which has 42 stamps. They expressed the number of stamps in different ways by multiplication. In this situation, which expression do you have in mind?





Naiko's idea

The expression is 6×5

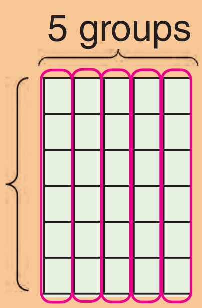


6 groups of 5

$5+5+5+5+5+5=30$

Yamo's idea

The expression is 5×6



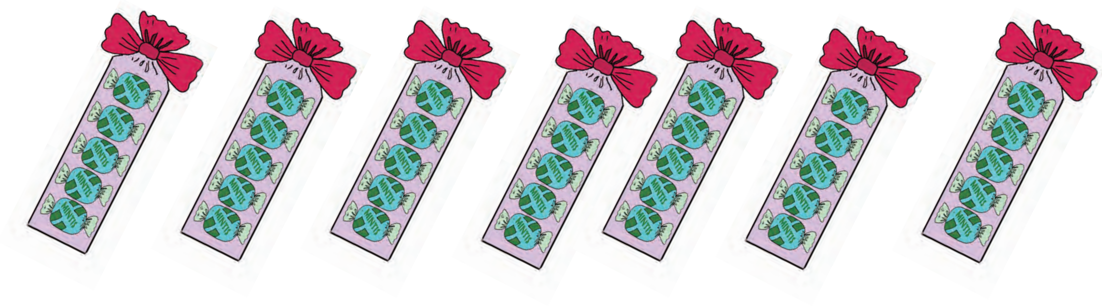
5 groups of 6.

$6+6+6+6+6=30$

The number given by "6 times of 5" is the same as the number given by " 5 times of 6". In other words, 6 groups of 5 and 5 groups of 6 give the same answer. In multiplication, "Multiplying 6 by 5" and "Multiplying 5 by 6" gives the same answer. In short, 6×5 is equal to 5×6.

The Multiplication of 5

5 Let's make a mathematical expression of multiplication for the number of lollies.



6 Let's draw a picture of 3×5.

7 There are 5 peanuts on each leaf. Let's find the total number of peanuts as the number of leaves increases from 1 to 5 and read the sentence.

$1\times5=5$
1 multiplied by 5 equals 5

$2\times5=\square$
2 multiplied by 5 equals 10

$\square\times\square=\square$

$\square\times\square=\square$

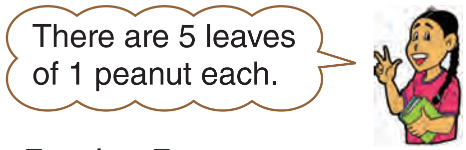
$\square\times\square=\square$

① Complete the mathematical sentences from 6 leaves to 9 leaves.

② Explain what you found.

How many peanuts increase as 1 leaf is added?

8 Let's consider the following pictures.

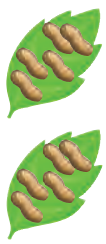


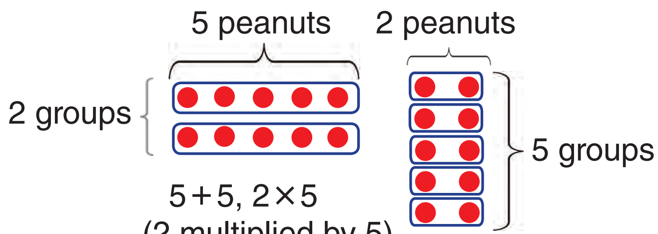
$5 \times 1 = 5$

$\square \times \square = \square$

$\square \times \square = \square$

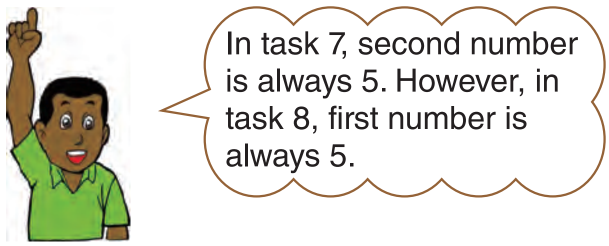
1. Complete the mathematical sentences from 4 peanuts to 9 peanuts.
2. Think about the difference compared to 3.

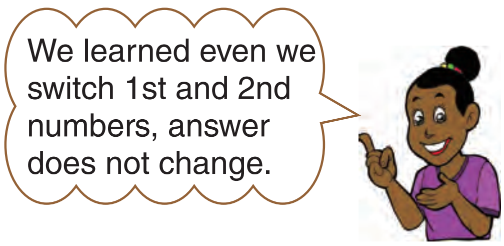




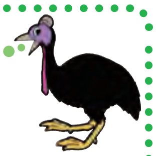
$5+5$, 2×5
(2 multiplied by 5)

$2+2+2+2+2$, 5×2
(5 multiplied by 2)





Grade 2 **Do you remember?**



Multiplication tabel of 5

$5 \times 1 = 5$	Five ones are 5	$5 \times 6 = 30$	Five sixes are 30
$5 \times 2 = 10$	Five twos are 10	$5 \times 7 = 35$	Five sevens are 35
$5 \times 3 = 15$	Five threes are 15	$5 \times 8 = 40$	Five eights are 40
$5 \times 4 = 20$	Five fours are 20	$5 \times 9 = 45$	Five nines are 45
$5 \times 5 = 25$	Five fives are 25		

The Multiplication Table 1 to 9

9 Let's explain the pattern and memorise it !

Multiplication table is necessary for our life. Say the multiplication table again and again until you can re-call correctly without looking!

The Multiplication Table of 1

1 x 1 = **1**	... One one is	1
1 x 2 = **2**	... One two is	2
1 x 3 = **3**	... One three is	3
1 x 4 = **4**	... One four is	4
1 x 5 = **5**	... One five is	5
1 x 6 = **6**	... One six is	6
1 x 7 = **7**	... One seven is	7
1 x 8 = **8**	... One eight is	8
1 x 9 = **9**	... One nine is	9

The Multiplication Table of 2

2 x 1 = **2**	... Two ones are	2
2 x 2 = **4**	... Two twos are	4
2 x 3 = **6**	... Two threes are	6
2 x 4 = **8**	... Two fours are	8
2 x 5 = **10**	... Two fives are	10
2 x 6 = **12**	... Two sixes are	12
2 x 7 = **14**	... Two sevens are	14
2 x 8 = **16**	... Two eights are	16
2 x 9 = **18**	... Two nines are	18

The Multiplication Table of 3

3 x 1 = **3**	... Three ones are	3
3 x 2 = **6**	... Three twos are	6
3 x 3 = **9**	... Three threes are	9
3 x 4 = **12**	... Three fours are	12
3 x 5 = **15**	... Three fives are	15
3 x 6 = **18**	... Three sixes are	18
3 x 7 = **21**	... Three sevens are	21
3 x 8 = **24**	... Three eights are	24
3 x 9 = **27**	... Three nines are	27

The Multiplication Table of 4

4 x 1 = **4**	... Four ones are	4
4 x 2 = **8**	... Four twos are	8
4 x 3 = **12**	... Four threes are	12
4 x 4 = **16**	... Four fours are	16
4 x 5 = **20**	... Four fives are	20
4 x 6 = **24**	... Four sixes are	24
4 x 7 = **28**	... Four sevens are	28
4 x 8 = **32**	... Four eights are	32
4 x 9 = **36**	... Four nines are	36

10 Let's discuss about the patterns you have found!

Mero's idea

If each number at the back increases by 1 in the table of 2, the answer increases by □!

Vavi's idea

In the table of 3, the answers increase by □ as the numbers at the back increases by □.

The Multiplication Table of 5

5 x 1 = **5**	... Five ones are	5
5 x 2 = **10**	... Five twos are	10
5 x 3 = **15**	... Five threes are	15
5 x 4 = **20**	... Fiver fours are	20
5 x 5 = **25**	... Five fives are	25
5 x 6 = **30**	... Five sixes are	30
5 x 7 = **35**	... Five sevens are	35
5 x 8 = **40**	... Five eights are	40
5 x 9 = **45**	... Five nines are	45

The Multiplication Table of 6

6 x 1 = **6**	... Six ones are	6
6 x 2 = **12**	... Six twos are	12
6 x 3 = **18**	... Six threes are	18
6 x 4 = **24**	... Six fours are	24
6 x 5 = **30**	... Six fives are	30
6 x 6 = **36**	... Six sixes are	36
6 x 7 = **42**	... Six sevens are	42
6 x 8 = **48**	... Six eights are	48
6 x 9 = **54**	... Six nines are	54

The Multiplication Table of 7

7 x 1 = **7**	... Seven ones are	7
7 x 2 = **14**	... Seven twos are	14
7 x 3 = **21**	... Seven threes are	21
7 x 4 = **28**	... Seven fours are	28
7 x 5 = **35**	... Seven fives are	35
7 x 6 = **42**	... Seven sixes are	42
7 x 7 = **49**	... Seven sevens are	49
7 x 8 = **56**	... Seven eights are	56
7 x 9 = **63**	... Seven nines are	63

The Multiplication Table of 8

8 x 1 = **8**	... Eight ones are	8
8 x 2 = **16**	... Eight twos are	16
8 x 3 = **24**	... Eight threes are	24
8 x 4 = **32**	... Eight fours are	32
8 x 5 = **40**	... Eight fives are	40
8 x 6 = **48**	... Eight sixes are	48
8 x 7 = **56**	... Eight sevens are	56
8 x 8 = **64**	... Eight eights are	64
8 x 9 = **72**	... Eight nines are	72

The Multiplication Table of 9

9 x 1 = **9**	... Nine ones are	9
9 x 2 = **18**	... Nine twos are	18
9 x 3 = **27**	... Nine threes are	27
9 x 4 = **36**	... Nine fours are	36
9 x 5 = **45**	... Nine fives are	45
9 x 6 = **54**	... Nine sixes are	54
9 x 7 = **63**	... Nine sevens are	63
9 x 8 = **72**	... Nine eights are	72
9 x 9 = **81**	... Nine nines are	81

The increase in the answer is the same as.......

Let's think if the patterns apply to all the other tables !

Say the multiplication tables at home to memorise!

4

Multiplication 2

1 Rules of Multiplication

1 Let's think about the multiplication table.

① What are the multiplications to get 14 in the table ?

② Write all the answers in the blanks.

③ Look for the answers 27 and 48 in the multiplication table.

Multiplier \ Multiplicand	1	2	3	4	5	6	7	8	9
1									
2							14		
3									
4									
5									
6									
7		14							
8									
9									

④ Let's find any patterns in the table and share with your friends.

The number we multiply is called the **multiplier**.
The number to be multiplied is called the **multiplicand**.

$2 \times 4 = 8$ ← **Answer**

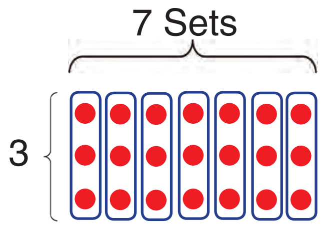
Multiplicand
Multiplier

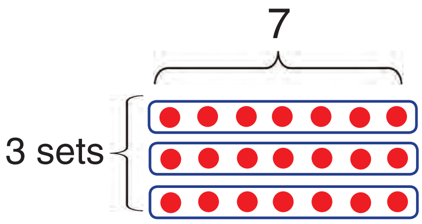
2 Let's find various rules from the expression that has the same answer for 7×3.

Let's remember what you studied on multiplication in 2nd grade.

① What number goes in the □ below.

$7 \times 3 = \square$ $\qquad$ $3 \times \square = \square$





Confirm your answer with the multiplication table.

When you express this in a mathematical sentence, it can be written as follows; $7 \times 3 = 3 \times \square$

"=" is called equal sign. This symbol is not only used for writing the answer of the calculation, but also used for showing that the expressions or numbers on the left side and the right side are equal.

In multiplication, the answer is the same even if the order of the multiplicand and multiplier are changed.

② How much larger is the answers for 7×6 than answer for 7×5?

	Multiplicand								
	1	2	3	4	5	6	7	8	9
7	7	14	21	28	35		49	56	63

Increase by □ $\qquad$ Decrease by □

When you express this in a mathematical sentence, it can be written as follows; $7 \times 6 = 7 \times 5 + \square$

3 How much smaller is it from the answer of 7×6 to the answer of 7×7?

Also, express this in a mathematical sentence.

$7\times6=7\times7-\square$

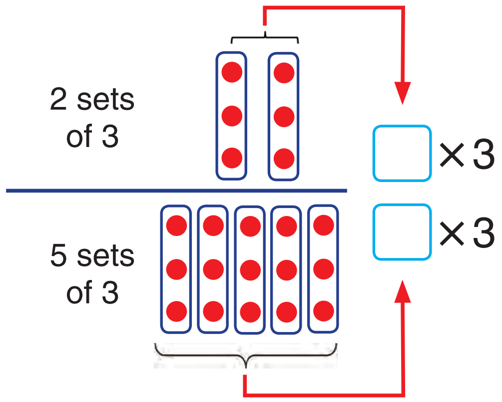
In multiplication, if the multiplicand increases by 1, the answer increases by the number of the multiplier. Also, if the multiplicand is reduced by 1, the answer is reduced by the number of the multiplier.

4 Let's think about what will happen to the answer if you split the 1st or 2nd number of 7×3.

① Splitting the multiplier.

7×3 <
- $2\times3=\square$
- $\square\times3=\square$

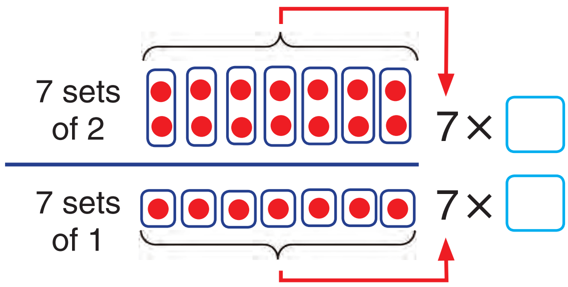
In total $\square$



② Splitting the multiplicand.

7×3 <
- $7\times2=\square$
- $7\times\square=\square$

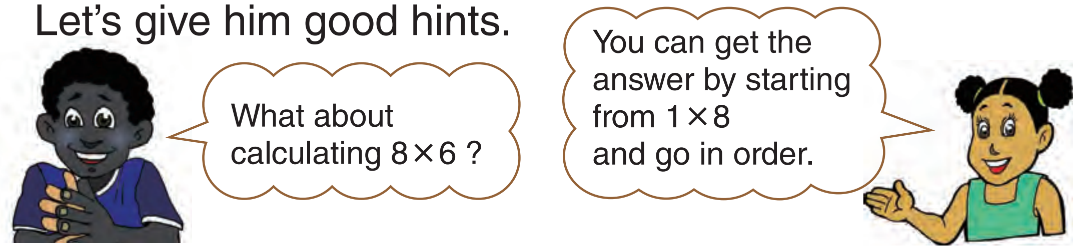
In total $\square$



Even, if we calculate a multiplication by splitting the multiplier or multiplicand, the answers are the same.

3 Samuel has difficulties in calculating the answer for 6×8.

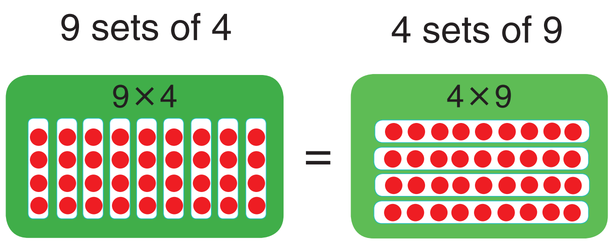
Let's give him good hints.



4 Represent the following by using mathematical sentences and diagrams.

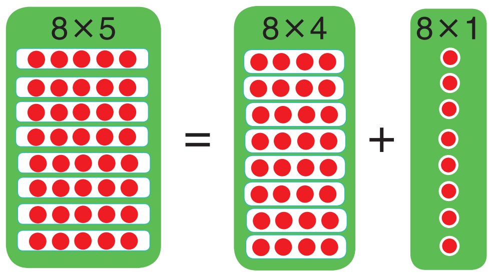
① If you exchange the order of the 1st and 2nd number in the expression 9×4, the answers will be the same as;

$9\times4=\square\times\square$



② The answer for 8×5 will be the same to the answer for 8×4 by adding 8.

$8\times5=\square\times\square+\square$



Activity

Exercise

Let's find the number which applies to the $\square$.

① $8\times7=\square\times8$ ② $9\times\square=3\times9$

③ 4×6 is $\square$ bigger than 4×5.

④ 5×8 is $\square$ smaller than 5×9 .

⑤ $7\times7=7\times\square+7$ ⑥ $3\times\square=3\times7-3$

5 Each child receives two sets of 3 pencils. How many pencils are needed for 4 students?

Let's explain Naiko and Kekeni's ideas.

Naiko's idea

4 children with 2 sets each

$4\times2=8$

$8\times3=\boxed{}$

8 sets of 3 pencils

How many sets for 4 children?

Kekeni's idea

2 sets of 3 pencils

$2\times3=6$

$4\times6=\boxed{}$

4 children with 6 pencils each

At first, how many pencils are there for each child?

Let's make one expression.

4×2 $\times3$

The number of sets / The number of pencils for each child

$4\times$ 2×3

The number of children / The number of pencils for each child

$$(4\times2)\times3 = 4\times(2\times3)$$

Brackets shows the order of calculation.

$\underbrace{(4\times2)}_{8}\times3$, $8\times3=24$

$4\times\underbrace{(2\times3)}_{6}$, $4\times6=24$

When multiplying several numbers, the answer does not change even if you switch the order of calculation.

6 Let's change the order of multiplication using brackets to check if the answers are the same. See example ① $2\times3\times3$.

① $2\times3\times3$ or $2\times3\times3$

$=(2\times3)\times3$ $=2\times(3\times3)$

$=6\times3$ $=2\times9$

$=18$ $=18$

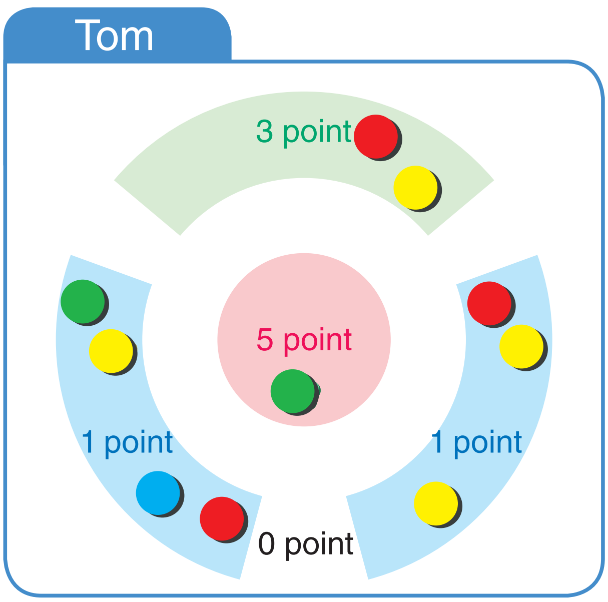
② $2\times4\times3$

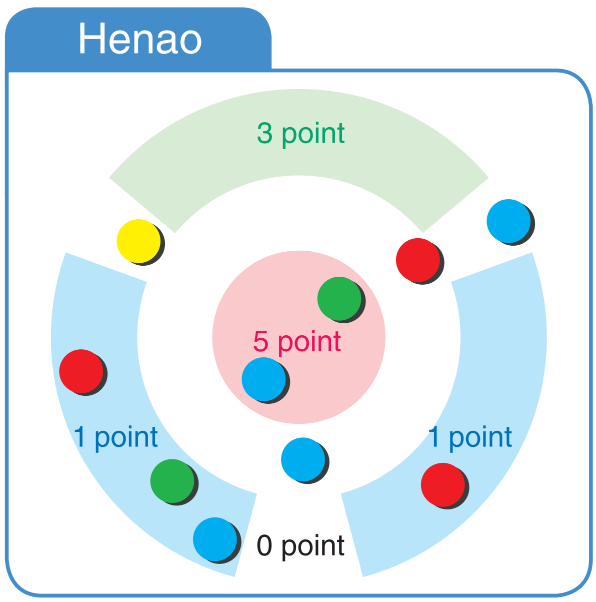
③ $2\times2\times3$

② Multiplication with 0

Point Scoring Game

In this game, you toss the bottle caps and gain point cards according to where the bottle caps stop. When 10 bottle caps are tossed, the team with the higher score wins.





1 Let's see how many points Tom has.

Tom's points table

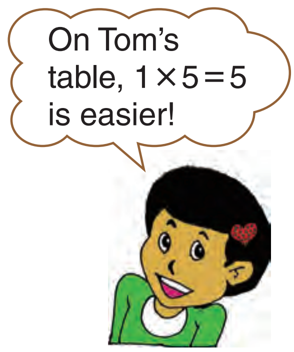
Points on card	5	3	1	Total
Number of cards obtained	1	2	7	10
Total points				

1 card of 5 points $1 \times \boxed{5} = \boxed{5}$

2 cards of 3 points $2 \times \boxed{} = \boxed{}$

7 cards of 1 point $7 \times \boxed{} = \boxed{}$

Number of cards | Points on card | Total points



2 Let's see how many points Henao has.

Henao's points table

Points on card	5	3	1	0	Total
Number of cards obtained	2	0	4	4	10
Total points					

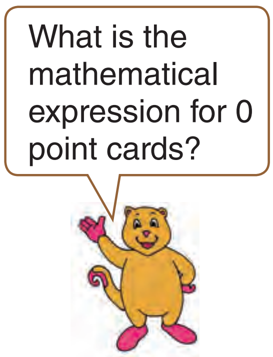
① Write the mathematical expressions for finding the total points.

2 cards of 5 points $\boxed{2 \times 5}$

0 card of 3 points $\boxed{}$

4 cards of 1 point $\boxed{}$

4 cards of 0 point $\boxed{}$



Let's think about how to find the answer for the multiplication with 0 later.

2. How can we find the total points for 0 cards of 3-point card?

$0\times3=\square$

$$3\times3=9$$
$$3\times2=6$$
$$3\times1=3$$
$$3\times0=\square$$

Reduced by $\square$

3. How can we find the total points for 4 cards of 0-point card?

$4\times0=\square$

$$3\times4=12$$
$$2\times4=8$$
$$1\times4=4$$
$$0\times4=\square$$

Reduced by $\square$

2 ③ The score for the 4 point card.

In the multiplication, the answer will be reduced by 4 every time the multiplier is reduced by 1.

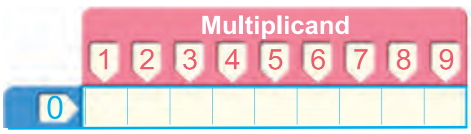
$4\times1=4$, so if the multiplicand is reduced by 1, the answer is reduced by 4, which makes $4\times0=0$.

Answer 0 points

$4\times5=20$	
	Reduced by 4
$4\times4=16$	
	Reduced by 4
$4\times3=12$	
	Reduced by 4
$4\times2=8$	
	Reduced by 4
$4\times1=4$	
	Reduced by 4
$4\times0=?$	

What is the total points for Henao? In the point scoring game, what does the expression 0×0 mean?

Whenever the multiplier is 0, the answer will be 0. Also, multiplying 0 to any number, the answer will be 0.



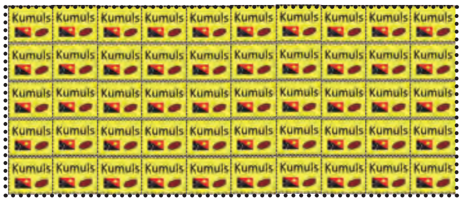
Fill in the multiplication table of 0.

Exercise

① 6×0 ② 4×0 ③ 0×7 ④ 0×5 ⑤ 0×0

3 Multiplication with 10

1 How many stickers are there altogether?



① Write two mathematical expressions to calculate the total number of stickers.

$\square \times \square$ $\square \times \square$

Using the rules of multiplication, think about how to multiply using 10.

② Let's think about how to find the answer for 5×10.

Sare's idea

In the multiplication table of 5, the answer will increase by 5.

$5 \times 9 = 45$
$5 \times 10 = 50$ Increased by 5

Ambai's idea

Split multiplicand 10 into 2 and 8.

5×10 < $5 \times 2 = 10$, $5 \times 8 = 40$

In total 50

③ Let's think about how to find the answer for 10×5.

Splitting 10 into 7 and 3, will produce 7×5 and 3×5…

Using the rule of multiplication…

Try writing the multiplication table of 10 in the table.

Exercise

1 Let's calculate.

① 6×10 ② 8×10 ③ 10×4 ④ 10×9

2 Find the answer for 10×10.

Exercise

1 Let's calculate.

Pages 56 ~ 61

① 9×0 ② 7×0 ③ 0×8 ④ 0×2

⑤ 4×10 ⑥ 7×10 ⑦ 10×8 ⑧ 10×7

⑨ $3 \times 2 \times 4$ ⑩ $4 \times 2 \times 5$ ⑪ $3 \times 3 \times 10$

2 Let's find the number which goes in $\square$.

Pages 48 ~ 51

① $3 \times 8 = 8 \times \square$ ② $4 \times \square = 6 \times 4$

③ $7 \times 5 = 7 \times 4 + \square$ ④ $6 \times \square = 6 \times 5 - 6$

⑤ $(3 \times 3) \times 2 = 3 \times (\square \times 2)$ ⑥ $7 \times (2 \times 4) = 7 \times \square$

3 Let's find the number which goes in $\square$.

Page 55

① 8×7

- $8 \times 3 = \square$
- $8 \times \square = \square$

In total $\square$

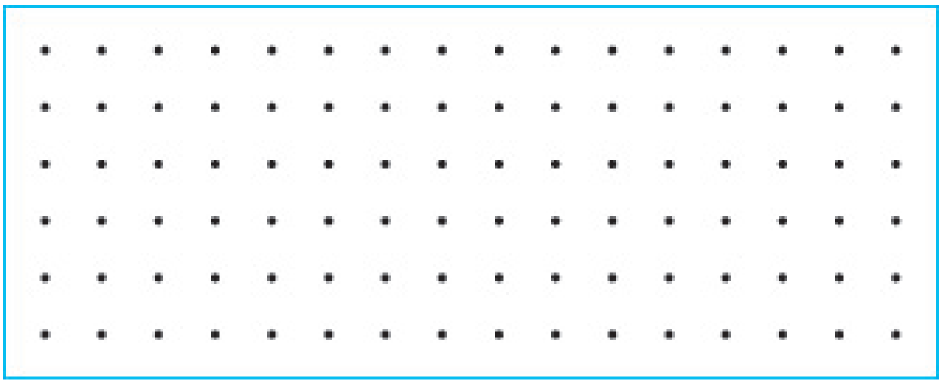
② 9×6

- $9 \times 6 = \square$
- $9 \times \square = \square$

In total $\square$

Grade 2 **Do you remember?**

Draw triangles and squares by connecting dots with straight lines.



Problems

1 Let's find the number which goes in the □.

● Understand the rules of calculating and multiplying by 0.

① $0\times6=$ □　② $1\times0=$ □　③ $5\times6=$ □ $\times5$

④ 3×9 is larger than 3×8 by □

⑤ 4×3 is smaller than 4×4 by □

2 Let's calculate the following.

● Multiplication with 0, 10 and using the brackets.

① 0×9　② 8×0　③ 0×0　④ 2×10

⑤ 10×6　⑥ $(2\times2)\times5$　⑦ $4\times(2\times3)$　⑧ $(2\times5)\times9$

3 A point scoring game was played using bottle caps.

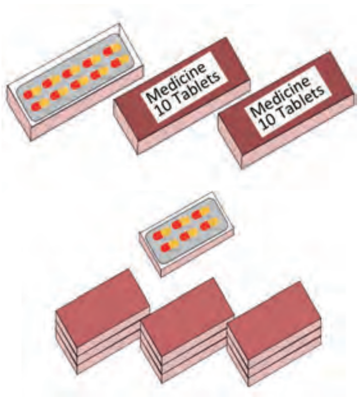
Let's find the total points gained by Mea.

● Multiplication with 0 and 10.

Mea's Score

Points on card	0	2	5	10	Total
Number of cards obtained	3	0	4	3	
Total points					

4 There are 3 boxes of 10 capsules of medicine and 10 boxes of 6 capsules each. How many capsules are there altogether? Express as one expression only and calculate it.



● Solving a story problem by developing the expression.

5 Thinking about How to Calculate

Let's write an expression to calculate the total number of lollies by filling in the blanks with various numbers and find the answers.

There are 4 packets of lollies. There are ☐ lollies in each packet. How many lollies are there altogether?

4 × ☐

1 There are 4 packets of lollies, each packet with12 lollies inside. How many lollies are there altogether?

Write down the multiplication expression for the total number of lollies.

☐ × ☐

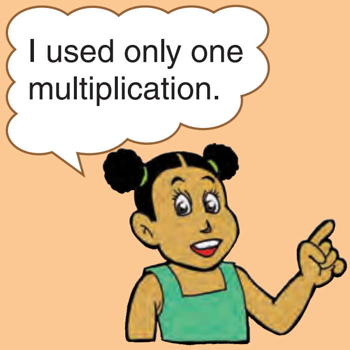
Number of packets / Number of lollies for each packet

Let's reflect on what you have learned, and think about ideas for calculating by using multiplication table.

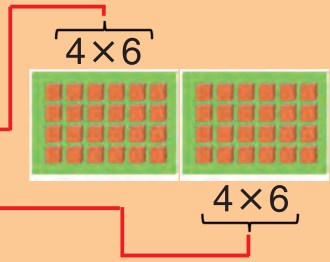
Let's think about how to calculate it, and explain using diagrams and expressions.

Yamo's idea

12 can be split into 6 and 6, so there are two 4×6.



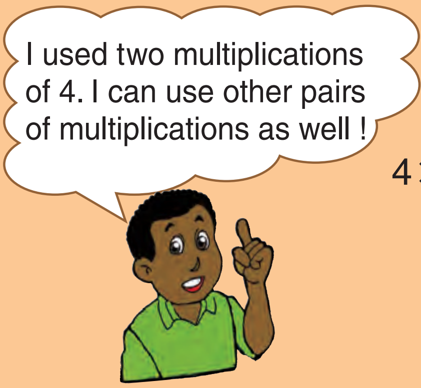
$$4\times12 \begin{cases} 4\times6=24 \\ 4\times6=24 \end{cases}$$



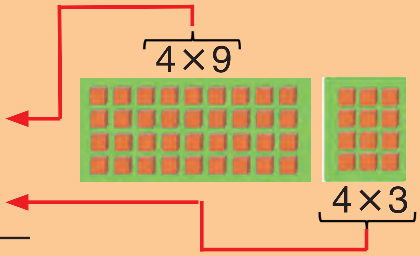
In total $\boxed{}$

Gawi's idea

12 can be split into 9 and 3,



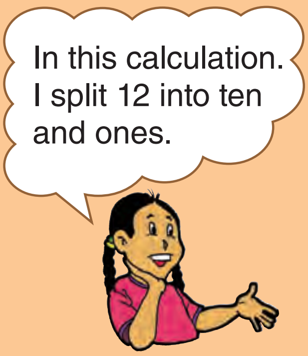
$$4\times12 \begin{cases} 4\times9=36 \\ 4\times3=12 \end{cases}$$



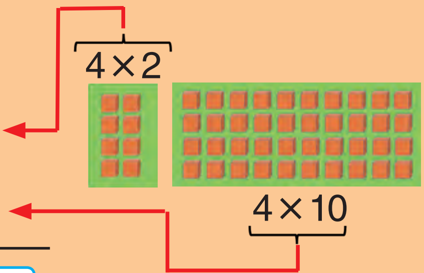
In total $\boxed{}$

Kekeni's idea

Multiplying 10s are easy, so splitting 12 into 2 and 10 will make,



$$4\times12 \begin{cases} 4\times\ 2\ =\ 8 \\ 4\times10=40 \end{cases}$$



In total $\boxed{}$

2 Let's find the answer for 4×18 in the various methods.

6 Duration and Time

Let's challenge standing on one foot while closing one eye.

How long can you stand? Ready to go!

1 Short Duration

1 Let's stand on one foot with closing an eye.

Who stands the longest ?

Let's investigate how to present short time.

Seconds are time units shorter than 1 minute.

1 minute = 60 seconds

Using a stopwatch, let's record the duration of how long you can stand on one foot?

The Time Taken on One Foot

Name	Time (seconds)

2 The table on the right shows the time that Bethel and other students who stood on one foot. Who stood the longest?

Name	Time
Bethel	1 minute 38 seconds
Fred	1 minute 47 seconds
Jeff	104 seconds

① Let's represent the time using only seconds, then fill in the blanks.

Bethel: 1 minute 38 seconds = $\boxed{}$ seconds

Fred: 1 minute 47 seconds = $\boxed{}$ seconds

$$\begin{array}{r} 38 \\ +60 \\ \hline \end{array} \text{ (1 minute)}$$

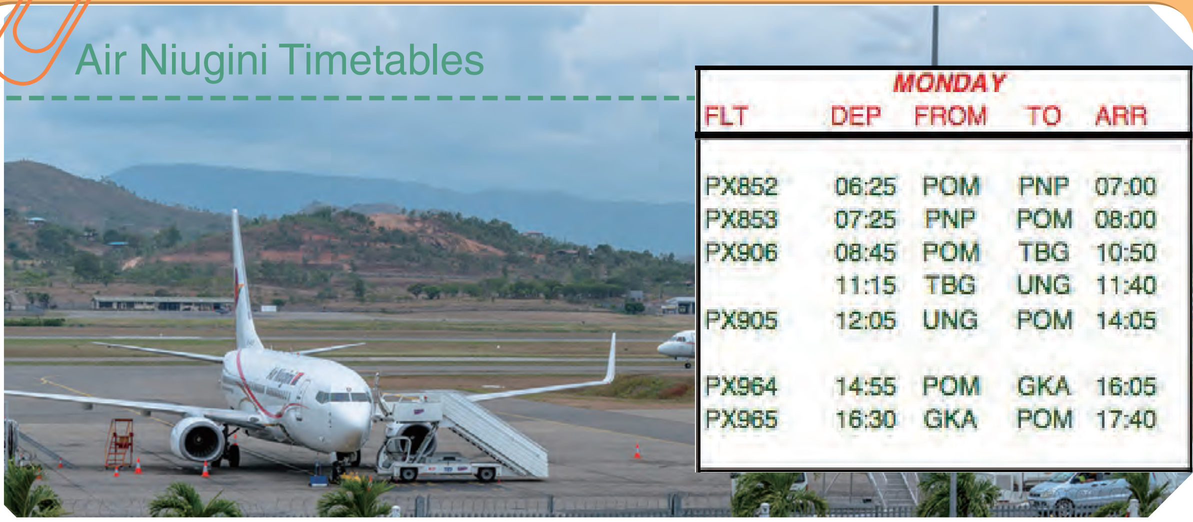
② Let's represent the duration of time using minutes and seconds.

Jeff: 104 seconds = $\boxed{}$ minutes $\boxed{}$ seconds

$$\begin{array}{r} 104 \\ -\ 60 \\ \hline \end{array} \text{ (1 minute)}$$

3 Let's record the time taken for a paper airplane flight, and record many other time represented by different situation.

Air Niugini Timetables



FLT	DEP	FROM	TO	ARR
MONDAY				
PX852	06:25	POM	PNP	07:00
PX853	07:25	PNP	POM	08:00
PX906	08:45	POM	TBG	10:50
	11:15	TBG	UNG	11:40
PX905	12:05	UNG	POM	14:05
PX964	14:55	POM	GKA	16:05
PX965	16:30	GKA	POM	17:40

Let's look at how flight timetables are written. The table above shows a flight schedule. The words "p.m." and "a.m." are not used. Why?

The first flight from Port Moresby (POM) to Popondetta (PNP) starts off at 25 past 6 a.m. The next one leaves at quarter to 9 a.m. for Tabubil (TBG).

PX 905 from Kiunga (UNG) arrives at 14:05, meaning 5 past 2 p.m.

Morning (a.m.) **Afternoon** (p.m.)

0 1 2 3 4 5 6 7 8 9 10 11 12 (o'clock)

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 (o'clock)

1 Read the following times

① 5:00 ② 9:30 p.m. ③ 6:23 ④ 8:50 ⑤ 4:15 p.m.

2 Read time in two ways using "a.m." or "p.m." and without using them.

Morning

Afternoon

Morning

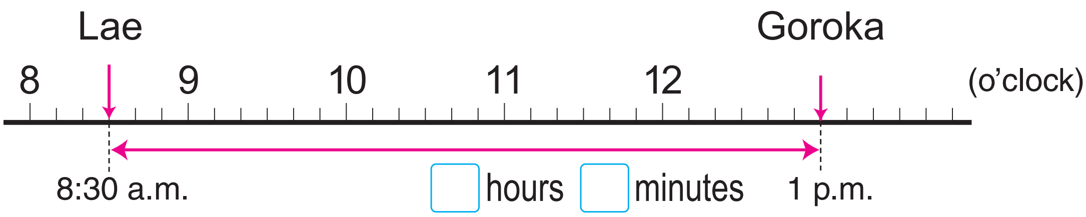
Afternoon

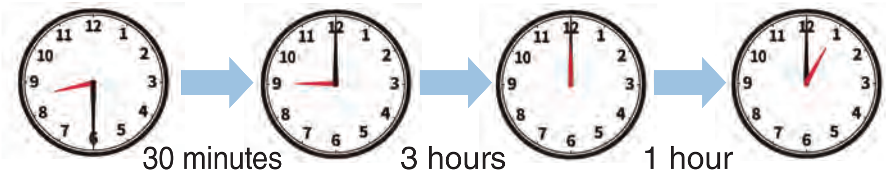
3 Write the time that your teacher says.

2 Duration and Time

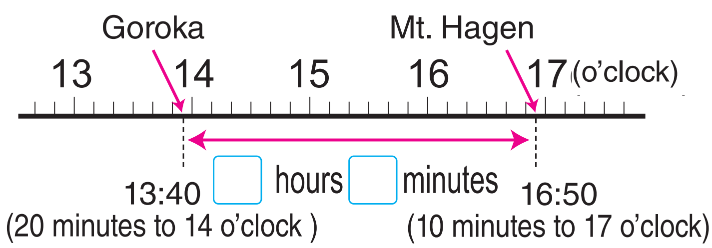
1 Asa wants to travel the highlands highway from Lae to Mt. Hagen. He thought about the duration which will take him to reach there.

① If he leaves Lae at 8:30 a.m. and arrives in Goroka at 1:00 p.m., how long will it take him from Lae to Goroka?





② If he will board another bus from Goroka to Mt. Hagen and the bus departs Goroka at 13:40, he will arrive in Mt. Hagen at 16:50. How many hours and minutes will it take him to reach Mt. Hagen from Goroka?



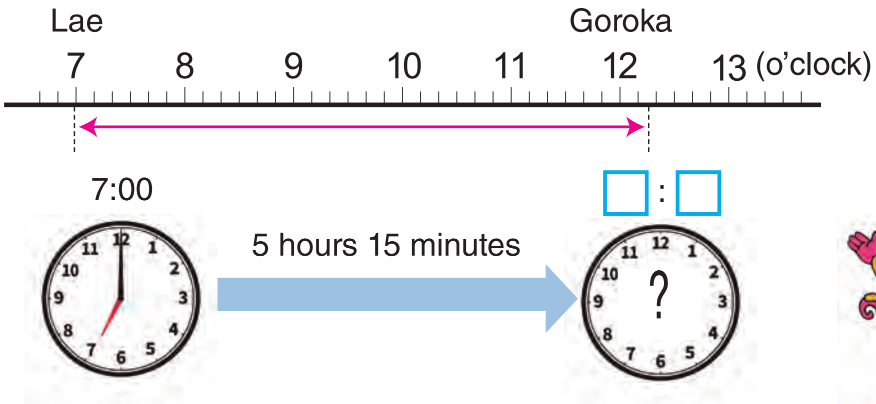
Mathematical expression: $\boxed{16:50 - 13:40}$

o'clock	minutes
16 :	50
− 13 :	40
☐	☐
hours	minutes

③ If you board both buses at ① and ②, how long will it take you in total by bus? Answer in hours and minutes?

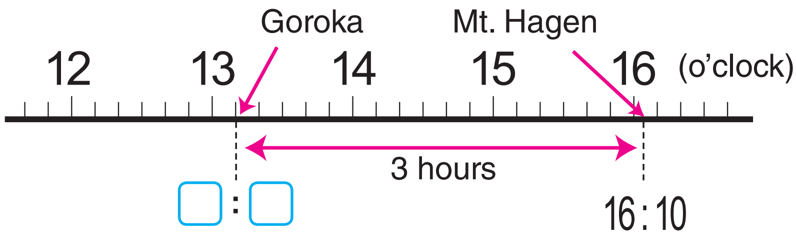
④ The bus “Tulait Tulait” leaves Lae city at 7o’clock, it will take the duration of 5 hours and 15 minutes to reach Goroka town. At what time will it reach Goroka town?

The time is shown as ◯ o’clock △ minute but the duration is expressd by ◯ hours and □minutes



⑤ The bus will arrive in Mt. Hagen at 16:10 from Goroka. It will take the duration of 3 hours to reach Mt.Hagen from Goroka. What time will it leave Goroka town?

When subtracting the duration of 3 hours change it to 3:00 for the calculation.



Mathematical expression: 16:10 − 3:00

	16 : 10
−	3 : 00
	□ hours □ minutes

Exercise

1 Ray was reading from 4:40 in the afternoon to 5:25 in the afternoon of the same day. How many minutes did he spend reading?

2 If you leave your house at 40 past 9 in the morning, and it took you the duration of 1 hour and 30 minutes to reach the garden. At what time in the morning will you reach the garden?

Page 63

1 Let's write the correct number in the following $\square$.

① 1 minute $=\square$ seconds

② 1 minute 20 seconds $=\square$ seconds

③ 180 seconds $=\square$ minutes

2 Vali and Utu participated in the town running. Vali finished the marathon in 5 minutes and 43 seconds.

Utu finished the marathon 25 seconds later than Vali's time. What was Utu's record ?

Page 63

3 One Sunday morning, Tim read a book for 1 hour and 10 minutes, and later read for 45 minutes in the afternoon. In total, how long did Tim read that Sunday?

Pages 65 ~ 66

4 Sandy attended soccer practice from 9:30 to 11:10 in the morning. How many hours and minutes did she practice?

Pages 65 ~ 66

5 It takes 25 minutes from Rui's home to the bus stop. To board the bus leaving at 10 minutes past 10 hours in the morning, at what time would she have to leave her home?

Pages 65 ~ 66

Let's calculate. Grade 3 Do you remember?

① 4×0	② 1×0	③ 0×3	④ 0×9
⑤ 7×10	⑥ 5×10	⑦ 10×3	⑧ 10×6

Problems

1 Arrange the duration of time in order from the longest.
● Understanding units and duration of time.

15 hours   1 day   3 hours 45 minutes

75 seconds   60 minutes

2 Let's write numbers in the $\square$.
● Understanding the relationship between units.

① 3 minutes = $\square$ seconds

② 1 minute 40 seconds = $\square$ seconds

③ 125 seconds = $\square$ minutes $\square$ seconds

④ 2000 seconds = $\square$ minutes $\square$ seconds

3 Let's write the units of time which fits in the $\square$.
● Using units of time correctly.

① The duration you took to eat breakfast: 20 $\square$.

② The duration you took to run 50 m: 13 $\square$.

③ The duration you took for a school trip: 7 $\square$.

4 A class period is 30 minutes long. If the class starts at 10 minutes after 10 o'clock, when does the class end?
● Getting time by using calculation.

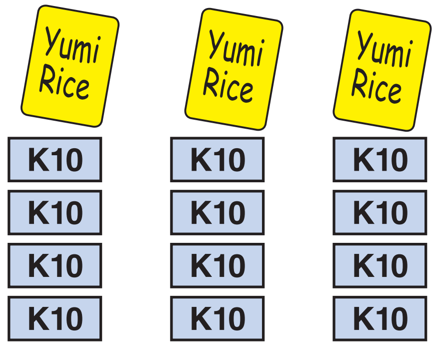
How Long Is the Duration of 3 Minutes?

How long is the duration of 3 minutes? Please guess the time with your eyes closed. Close your eyes, count in your mind after the start sign. Then raise your hand when you counted 3 minutes.
Please measure your time using stopwatch.
Let's find out something in the duration of 3 minutes.

7 Multiplication in Vertical form

1 Multiplication with Tens and Hundreds

1 A mother bought 3 rice bags for 40 kina each. How much is the total cost altogether?

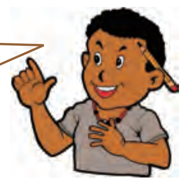


① Write the mathematical expression.

$\square \times \square$

Number of rice bags — Cost of one rice bag

We know that we can change the order of multiplication, so $3 \times 40 = 40 \times 3$.



3 times 40, $40 + 40 + 40 = 120$, easy to add! How can we calculate 40×3?

Let's think about how to calculate 40×3.

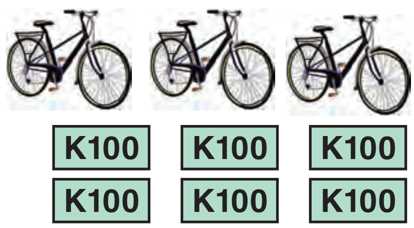
$4 \times 3 = \square$

$40 \times 3 = \square$

How many K10 notes are there?

② Twelve 10 kina notes equals $\square$.

2 There are 3 bicycles for 200 kina each. How much is the total cost altogether?



① Six 100 kina notes equals $\square$.

$2 \times 3 = \square$

$200 \times 3 = \square$

Exercise

Let's calculate.

① 20×3 ② 30×5 ③ 80×2 ④ 50×6

⑤ 300×2 ⑥ 400×3 ⑦ 600×4 ⑧ 800×5

2 How to Calculate (2-digit numbers) × (1-digit number)

1 Teacher bought 21 chocolates which cost 3 kina each for a class party. How much is the total cost of chocolates altogether?

21 × 3

① Write an expression to find the total cost.

$\square \times \square$

Number of chocolates | Cost of one chocolate

If we change the order of multiplication, how can we find the answer?

② Let's think about how to calculate 21 × 3.

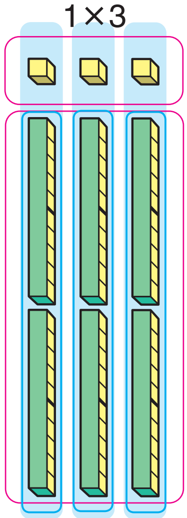
Can we use the multiplication table?

Let's think about how to calculate (2-digit numbers) × (1-digit number).

Activity

Considering How to Calculate 21 × 3

1×3



20×3

Using the place values, 21 split into 1 on ones and 2 on tens. We can calculate 1 × 3 and 20 × 3.

There are 3×2 sets of 10's blocks.

$$21\times3 \begin{cases} 1\times3=\boxed{} \\ 20\times3=\boxed{} \end{cases}$$

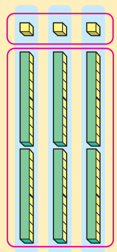
Total $\boxed{}$

There are 3 sets of 20 blocks.

3 For calculating multiplication, we can use vertical form. Let's explain how to multiply 21 × 3 in vertical form.

$$\begin{array}{r} 21 \\ \times\ \ 3 \\ \hline \end{array}$$

Using the row of the multiplier in the multiplication table makes the calculation easier. When multipying vertically, we swap the order of multiplication.



3×1

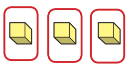
3×20

$$\begin{array}{r} 21 \\ \times\ \ 3 \\ \hline 3 \\ 60 \\ \hline 63 \end{array}$$

Multiplication Algorithm for 21 × 3 in Vertical Form

$$\begin{array}{r} 21 \\ \times\ \ 3 \\ \hline \end{array}$$

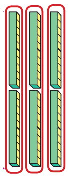
Line up the ones and tens places vertically.



Ones place

$$\begin{array}{r} 21 \\ \times\ \ 3 \\ \hline 3 \end{array}$$

1 times 3 equals 3.
3 in the ones place.



Tens place

$$\begin{array}{r} 21 \\ \times\ \ 3 \\ \hline 63 \end{array}$$

21 Multiplicand
3 Multiplier

2 times 3 equals 6.
6 is in the tens place.

$$\begin{array}{r} 21 \\ \times\ \ 3 \\ \hline 63 \end{array}$$

Exercise

Let's multiply in vertical form.

① 34×2 ② 23×3 ③ 42×2 ④ 11×4

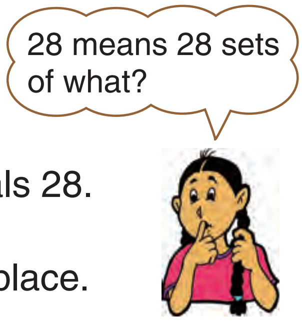
2 Let's think about how to multiply in vertical form.

① 71×4

$$\begin{array}{rrr} & 7 & 1 \\ \times & & 4 \\ \hline & & \square \end{array} \quad \rightarrow \quad \begin{array}{rrr} & 7 & 1 \\ \times & & 4 \\ \hline \square & \square & 4 \end{array}$$

4 multiplied by 1 equals 4.
$\square$ is in the ones place.

4 multiplied by 7 equals 28.
8 is in the tens place.
$\square$ is in the hundreds place.

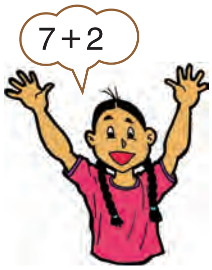


② 13×7

$$\begin{array}{rrr} & 1 & 3 \\ \times & & 7 \\ \hline & {\scriptstyle 2} & 1 \end{array} \quad \rightarrow \quad \begin{array}{rrr} & 1 & 3 \\ \times & & 7 \\ \hline & {\scriptstyle 2} & 1 \\ & 7 & \end{array} \quad \rightarrow \quad \begin{array}{rrr} & 1 & 3 \\ \times & & 7 \\ \hline & \square & \square \end{array}$$

7 multiplied by 3 equals 21.
1 is in the ones place.
2 of 10 is carried to
the tens place.

7 multiplied by 1
equals 7.
In the tens place,
7+2 equals $\square$.

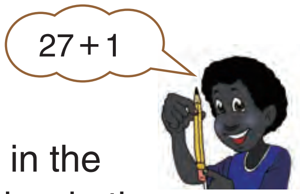


③ 95×3

$$\begin{array}{rrr} & 9 & 5 \\ \times & & 3 \\ \hline & {\scriptstyle 1} & 5 \end{array} \quad \rightarrow \quad \begin{array}{rrr} & 9 & 5 \\ \times & & 3 \\ \hline & {\scriptstyle 1} & 5 \\ 2 & 7 & \end{array} \quad \rightarrow \quad \begin{array}{rrr} & 9 & 5 \\ \times & & 3 \\ \hline \square & \square & \square \end{array}$$

3 multiplied by 5 equals 15.
$\square$ is in the ones place.
1 is carried to the
tens place.

3 multiplied by 9
equals 27.
27+1=$\square$. The number in the
tens place is $\square$. The number in the
hundreds place is $\square$.

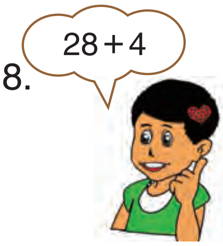


3 Let's think about how to multiply 46×7 in vertical form.

$$\begin{array}{rrr} & 4 & 6 \\ \times & & 7 \\ \hline & {\scriptstyle 4} & 2 \end{array} \quad \rightarrow \quad \begin{array}{rrr} & 4 & 6 \\ \times & & 7 \\ \hline & {\scriptstyle 4} & 2 \\ 2 & 8 & \end{array} \quad \rightarrow \quad \begin{array}{rrr} & 4 & 6 \\ \times & & 7 \\ \hline \square & \square & \square \end{array}$$

7 multiplied by 6 equals 42.
2 is in the ones place.
$\square$ is carried to the
tens place.

7 multiplied by 4 equals 28.
$\square$ is in the tens place.
$\square$ is in the
hundreds place.



Exercise

Let's multiply in vertical form.

① 93×3	② 41×5	③ 63×2	④ 30×8
⑤ 14×7	⑥ 13×5	⑦ 24×3	⑧ 49×2
⑨ 64×3	⑩ 85×9	⑪ 18×6	⑫ 26×4
⑬ 59×7	⑭ 35×9	⑮ 65×8	⑯ 84×6

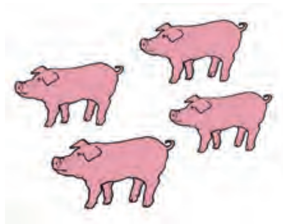
E x e r c i s e

1 Let's multiply in vertical form. Pages 71 ~ 73

① 15×3	② 24×4	③ 47×2	④ 12×6
⑤ 42×6	⑥ 63×7	⑦ 58×4	⑧ 74×9
⑨ 38×8	⑩ 35×6	⑪ 80×4	⑫ 500×6

2 Kazu bought 4 piglets. 1 piglet costs 55 kina. Page 70

How much is the total cost altogether?



3 Make a phrase by arranging in order of putting the following letters from the lowest to the largest answer. Pages 72

T 73×8	S 87×9	H 93×8	V 68×4	O 30×9
A 57×8	M 42×9	I 12×8	E 46×6	L 31×5

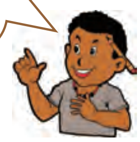
「○○○○○○○○○○」

3 How to Calculate (3-digit numbers) × (1-digit number)

1 There are 213 children in a school. Each child visited the fish pond 3 times in a week. How many times in a week did the children visit in total?

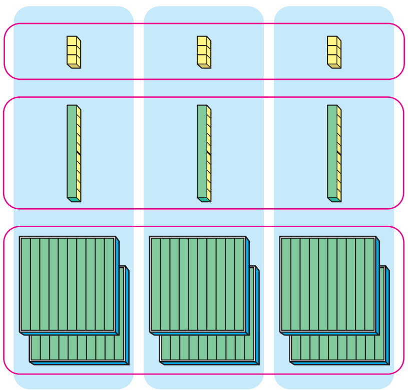
① Write an expression.

$\boxed{}$



② Let's think about how to calculate 213×3.

Considering How to Calculate 213×3



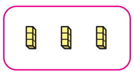
$$3\times 3 = 9$$
$$3\times 10 = 30$$
$$3\times 200 = 600$$

Total $\boxed{}$

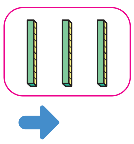
③ Let's explain how to multiply in vertical form.

Multiplication Algorithm for 214×3 in Vertical Form

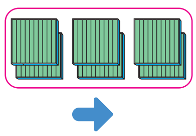
Ones place | Tens place | Hundred place



$$\begin{array}{r} 2\,1\,3 \\ \times \quad\;\; 3 \\ \hline \boxed{} \end{array}$$



$$\begin{array}{r} 2\,1\,3 \\ \times \quad\;\; 3 \\ \hline \boxed{}\,9 \end{array}$$



$$\begin{array}{r} 2\,1\,3 \\ \times \quad\;\; 3 \\ \hline \boxed{}\,3\,9 \end{array}$$

Exercise

Let's multiply in vertical form.

① 142×2 ② 423×2 ③ 312×3 ④ 121×4

Activity

2 Let's explain how to multiply by carrying numbers to the superior place values.

① $$\begin{array}{r} 421 \\ \times\quad 3 \\ \hline 3 \end{array} \rightarrow \begin{array}{r} 421 \\ \times\quad 3 \\ \hline 63 \end{array} \rightarrow \begin{array}{r} 421 \\ \times\quad 3 \\ \hline 1263 \end{array}$$

② $$\begin{array}{r} 461 \\ \times\quad 3 \\ \hline 3 \end{array} \rightarrow \begin{array}{r} 461 \\ \times\quad 3 \\ \hline {}^{1}83 \end{array} \rightarrow \begin{array}{r} 421 \\ \times\quad 3 \\ \hline {}^{1}83 \\ 12 \end{array} \rightarrow \begin{array}{r} 461 \\ \times\quad 3 \\ \hline 1383 \end{array}$$

③ $$\begin{array}{r} 876 \\ \times\quad 7 \\ \hline {}^{4}2 \end{array} \rightarrow \begin{array}{r} 876 \\ \times\quad 7 \\ \hline {}^{4}2 \\ 49 \end{array} \rightarrow \begin{array}{r} 876 \\ \times\quad 7 \\ \hline {}^{5}32 \\ 56 \end{array} \rightarrow \begin{array}{r} 876 \\ \times\quad 7 \\ \hline 6132 \end{array}$$

④ $$\begin{array}{r} 334 \\ \times\quad 3 \\ \hline {}^{1}2 \end{array} \rightarrow \begin{array}{r} 334 \\ \times\quad 3 \\ \hline {}^{1}2 \\ 9 \end{array} \rightarrow \begin{array}{r} 334 \\ \times\quad 3 \\ \hline {}^{1}02 \\ 9 \end{array} \rightarrow \begin{array}{r} 334 \\ \times\quad 3 \\ \hline 1002 \end{array}$$

3 Let's explain how to multiply with '0' in vertical form.

① $$\begin{array}{r} 320 \\ \times\quad 4 \\ \hline 1280 \end{array}$$ ② $$\begin{array}{r} 405 \\ \times\quad 8 \\ \hline 3240 \end{array}$$ ③ $$\begin{array}{r} 700 \\ \times\quad 6 \\ \hline 4200 \end{array}$$

Exercise

1 Let's multiply in vertical form.

① 321×4	② 413×3	③ 341×5	④ 731×9
⑤ 654×3	⑥ 235×6	⑦ 364×8	⑧ 749×7
⑨ 128×8	⑩ 429×7	⑪ 556×9	⑫ 667×6
⑬ 420×7	⑭ 302×9	⑮ 706×3	⑯ 600×2

2 Uncle James bought 8 airplane tickets for holidays that cost 525 kina each.

How much is the total cost?

④ Mental Calculation

1 A torch costs 24 kina. How much is the cost of 3 torches? Let's try to calculate the answer without vertical form. 24×3

To calculate 24×3 mentally, you do as shown on the right.

$$\overset{①}{24 \times 3}\ ②$$

2 Let's calculate 76×4 mentally.

3 Aunty Marie bought 6 bags of kaukau for 65 kina each and 6 live chicken for 35 kina each. How much is the total cost?

Exercise

Let's calculate mentally.

① 34×2 ② 17×3 ③ 25×6 ④ 58×9

Exercise

1 Let's calculate mentally.

Pages 72 ~ 75

① 33×3 ② 76×8 ③ 43×7

④ 56×4 ⑤ 29×5 ⑥ 94×6

⑦ 324×2 ⑧ 254×6 ⑨ 483×5

⑩ 112×9 ⑪ 527×7 ⑫ 638×8

2 Let's fill in the $\square$ with an appropriate number.

For calculating 84×7, we split it into $4 \times \square$ and $80 \times \square$ and then add the answers for the total.

Pages 72 ~ 75

3 Father purchased 6 boat tickets each costing 125 kina.

How much is the total cost?

Pages 74 ~ 76

4 There is a park which is 340 metres in perimeter near Roni's house. Roni ran around the park 4 times.

How many metres did he run in total?

Pages 74 ~ 76

Grade 3 Do you remember?

Let's find the number which applies in the $\square$.

① $5 \times 8 = \square \times 5$ ② $7 \times \square = 3 \times 7$

③ $3 \times 6 = 3 \times 5 + \square$ ④ $9 \times 4 = 9 \times \square - 9$

⑤ $(3 \times 3) \times 2 = 3 \times (\square \times 2)$ ⑥ $7 \times 2 \times 4 = 7 \times \square$

Problems

1 Let's fill in the ☐ with an appropriate number.

● Understanding how to calculate (3 - digit number) × (1 - digit number).

For calculating 384 × 7, split the calculation into 7 × ☐,
7 × ☐ and 7 × ☐ and then add the answers for the total.

384 × 7

7 × 4 = ☐

7 × 80 = ☐

7 × 300 = ☐

Total ☐

2 Let's calculate in vertical form.

● Understanding how to calculate in vertical form.

① 50 × 3	② 300 × 3	③ 600 × 7
④ 22 × 4	⑤ 45 × 6	⑥ 64 × 8
⑦ 223 × 3	⑧ 379 × 7	⑨ 584 × 5

3 Let's find the mistakes in the vertical calculations below and calculate the correct answer.

● Finding mistakes in calculations and calculate in the appropriate ways.

①
$$\begin{array}{r} 85 \\ \times \quad 3 \\ \hline 2415 \end{array}$$
(　　　　)

②
$$\begin{array}{r} 276 \\ \times \quad 4 \\ \hline 804 \end{array}$$
(　　　　)

③
$$\begin{array}{r} 504 \\ \times \quad 2 \\ \hline 108 \end{array}$$
(　　　　)

4 If you buy 8 sets of sports shoes and socks when one pair of shoe costs 125 kina and socks which costs 10 kina, how much is the total cost?

● Distinguishing the situations for the multiplication and calculate the answer.

Problems

1 3 adults and 3 children went to Mailu from Alotau by boat. The fare costs 60 kina for a child and 120 kina for an adult. What was the total cost?

● Distinguishing the situations for the multiplication and calculating the answer.

2 There is a set of number cards from $\boxed{0}$ to $\boxed{9}$, one card for each number. Using these cards, make calculation problems for a (2-digit number) × (1-digit number).

$$\begin{array}{r} \square\square \\ \times \quad \square \\ \hline \end{array}$$

① Find a calculation with the largest answer.

② Find a calculation with the largest answer with 2-digits numbers. Also, explain why that is the largest answer.

● Making calculation problems with estimation.

3 There is a 3-digit number. If you multiply 3 to that number, the answer is shown below. In the same letter, the same number fits in. Think about a 3-digit number $\boxed{A}\,\boxed{B}\,\boxed{C}$.

$$\begin{array}{r} \boxed{A}\,\boxed{B}\,\boxed{C} \\ \times \qquad 3 \\ \hline 4\,\boxed{C}\,\boxed{A} \end{array}$$

Explain how you found the 3-digit number in order.

● Thinking about the vertical form.

8 Division

There are 12 lollies. Let's share the lollies amongst 4 children.

There are 12 lollies. Share 4 lollies to each child.

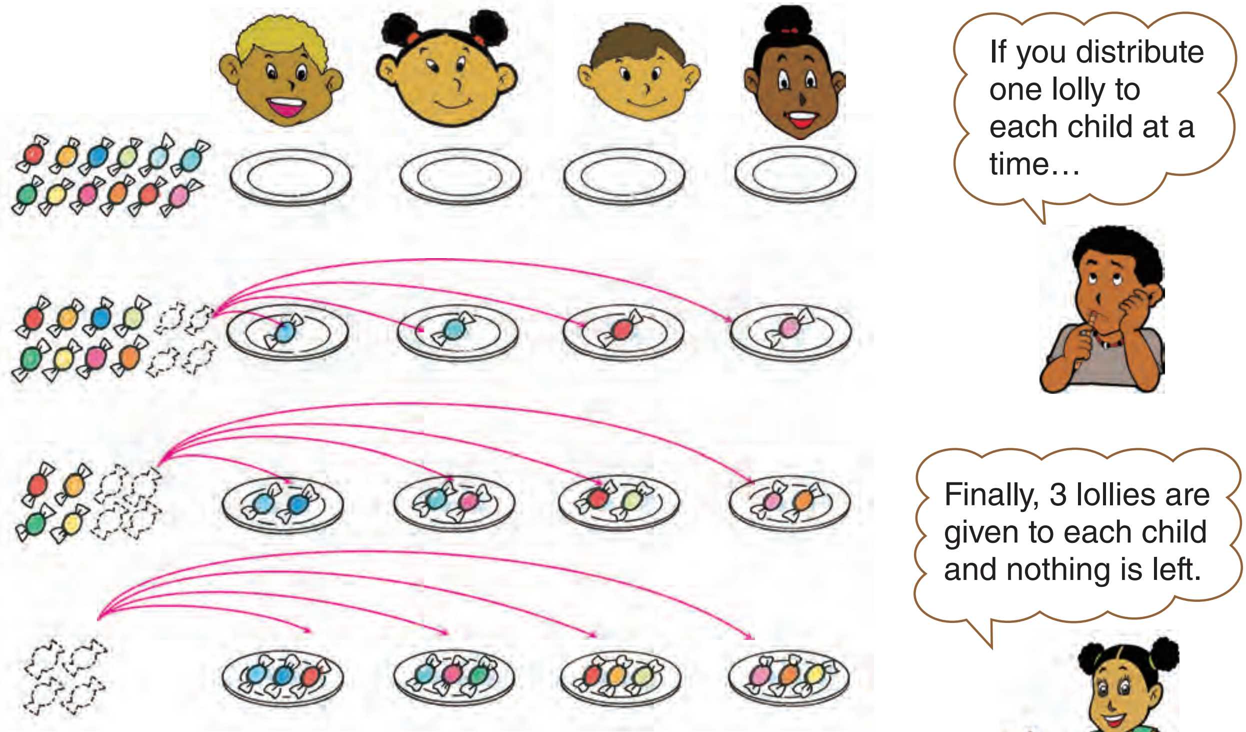
Let's Discuss about the differences between the two stories.

1 Division

1 There are 12 lollies. If 4 children share them equally, how many lollies will be given to each child?

Let's think about a calculation for distributing things equally.

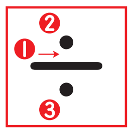
They divided 12 lollies equally amongst 4 children as follows.



The number of lollies for each child is 3 lollies.

If you divide 12 lollies amongst 4 children equally, each child gets 3. In a mathematical sentence, it can be written as $12 \div 4 = 3$ and read as; 12 divided by 4 equals 3.

12	÷	4	=	3	
Total number		Number of children		Number of lollies for each child	Answer 3 lollies



2 Let's write mathematical sentences for the following story problems below, and find the number of blocks given to each person.

Share 6 blocks equally amongst 3 children. $\square \div \square = \square$

Share 15 blocks evenly amongst 5 children. $\square \div \square = \square$

Let's do this problem while putting other numbers for blocks and children.

Calculations such as $12 \div 4 = 3$ and $6 \div 3 = 2$ are called **division**.

The divisions used in **1** and **2** are calculations to find how many lollies for each child when the total number of lollies are equally distributed to the number of children.

Meaning of "division"

Dividing a tomato equally.

Dividing coconuts evenly.

Dividing a pizza into 6 pieces equally.

3 Divide 15 blocks equally amongst 3 children.

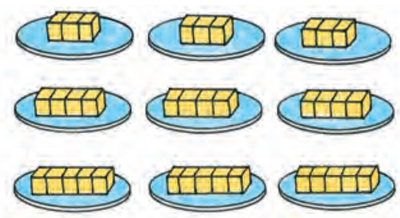
How many blocks does each one receive?

If each child gets 2, 2×3 is 6, so everyone can get more!

3 blocks for each child

4 blocks for each child

5 blocks for each child



Number of children		Blocks per child		Blocks in total
3	×	$\square$	=	9
3	×	$\square$	=	12
3	×	$\square$	=	15

The answer to $15 \div 3$ is in the box in $3 \times \square = 15$.

The answer is found by using the the multiplication table of 3.

$15 \div 3 = \square$

Three threes are 9.

Four threes are 12.

Five threes are 15.

4 Divide 10 dL of juice equally amongst 5 children.

How many dL of juice does each child receive?

$\square \div \square = \square$

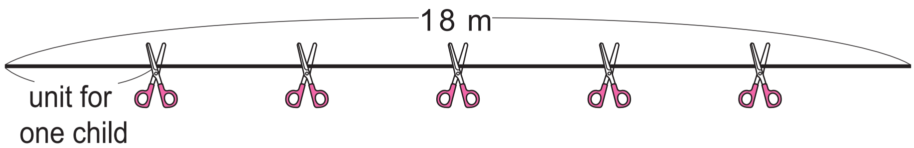
Answer: $\square$ dL

Which column of the multiplication table should we use?

Exercise

1 Divide a 18 m skipping rope equally amongst 6 children.

How many metre (m) does each child receive?



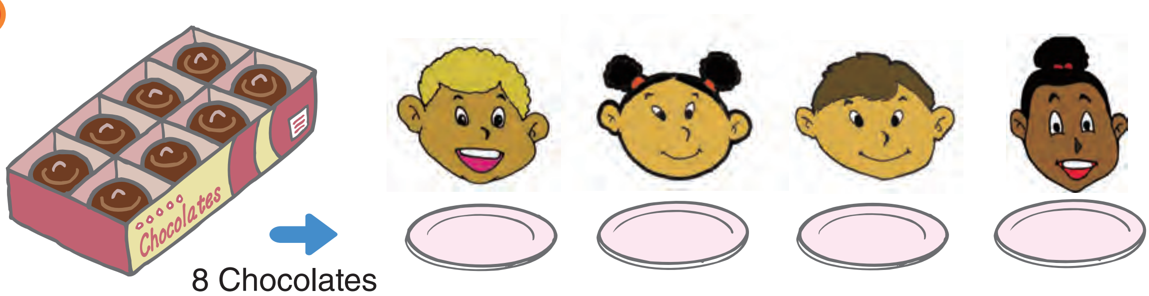
2 Which column or row of the multiplication table should you use to do these division problems? Mention the column or row and find the answer.

① 8÷2 ② 21÷7 ③ 72÷9 ④ 28÷4

⑤ 20÷5 ⑥ 56÷8 ⑦ 21÷3 ⑧ 54÷6

5 Make a problem of equal sharing that is solved by division and by looking at the picture.

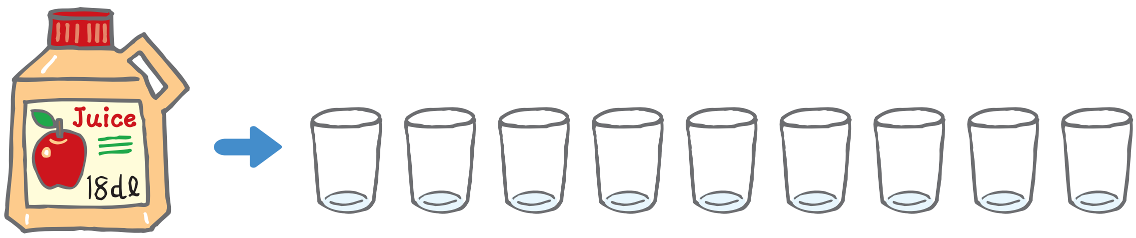
1



The problem developed by Asa

☐ chocolates are divided equally among ☐ children. How many chocolates are given to each child?

2



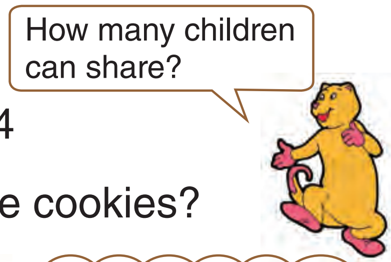
6 Let's divide.

1 14÷2 2 4÷2 3 27÷9 4 40÷5 5 32÷8

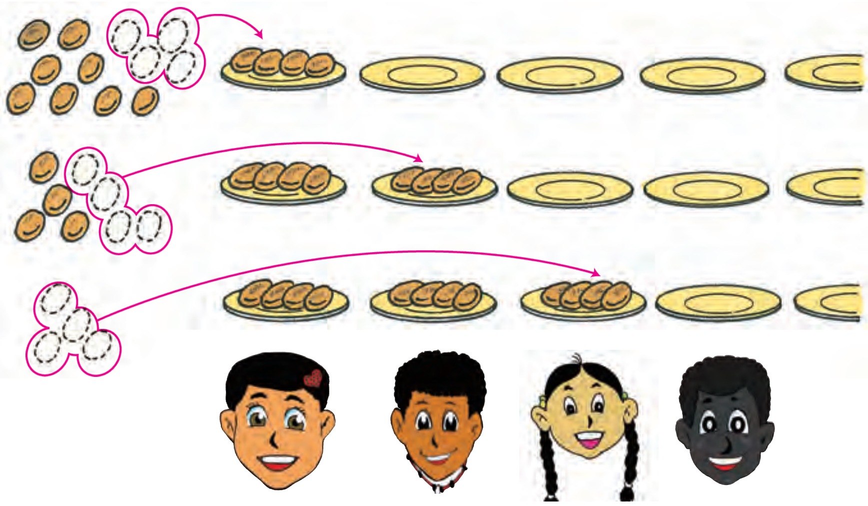
6 12÷2 7 18÷3 8 45÷9 9 42÷7 10 16÷8

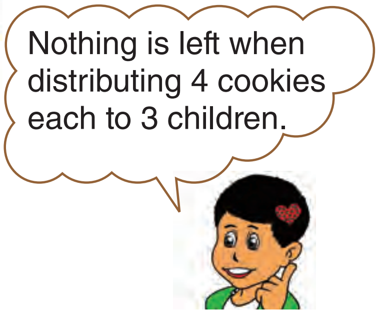
11 24÷4 12 25÷5 13 12÷6 14 49÷7 15 24÷3

Calculate the Number of Children



7 There are 12 cookies. If one child receives 4 cookies only, how many children can receive cookies?





If you share 12 cookies to each child by 4 cookies each, it can be shared by 3 children. In a mathematical sentence, it can also be represented by the division and written as $12 \div 4 = 3$.

$$12 \div 4 = 3$$

12: Total number of cookies; 4: Number of cookies to each child; 3: Number to children

Answer: 3 children

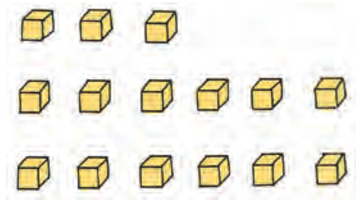
The division used in **7** is a calculation to find how many children can receive when the total number of things are distributed by the same number to each child.

8 There are 8 marbles. If you give 2 marbles to each child, how many children can share them?

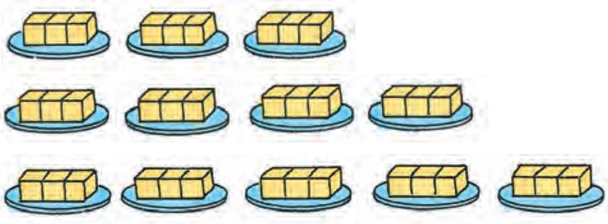
$\square \div \square = \square$ Answer: $\square$ children

Total number of marbles; Number of marbles to each child; Number of children

9 You share 15 blocks to each child by 3 each. How many children can share the blocks?



$15 \div 3$



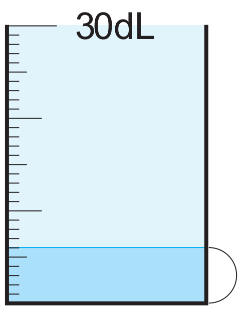
For **3** children	$\boxed{3} \times 3 = 9$
For **4** children	$\boxed{4} \times 3 = 12$
For **5** children	$\boxed{5} \times 3 = 15$

Number of children — Number of blocks to each child — Total number of blocks

The answer for $15 \div 3$ is the number that fits in the box for $\square \times 3 = 15$.
The answer for $15 \div 3$ can be obtained by using the multiplication table of 3.

$15 \div 3 = \square$
Three threes are 9.
Four threes are 12.
Five threes are 15.

10 There are 30 dL of kerosene. If you use 6 dL for a kerosene stove for cooking in one day, how many days can you use?



$\square \div \square = \square$ Answer: $\square$ days

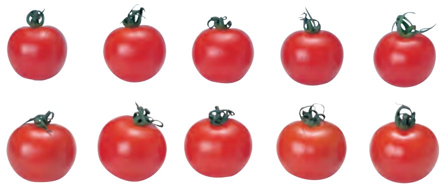
Do you know!

Decilitre (dL, DL, dl) is
a unit of measurement of volume.
10 dL = 1 litre (L)

Exercise

There are 24 pencils. If you put 6 pencils only to each box, how many boxes do you need?

11 Look at the tomatoes on the right and make a story problem for **10 ÷ 5**.



Division to find the number of tomatoes in each plastic bag.

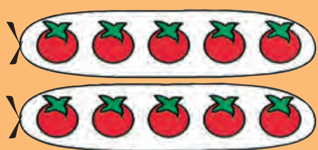
① Divide 10 tomatoes equally into $\square$ plastic bags.
How many $\square$ are in each $\square$?

10 ÷ 5 = 2

Division to find the number of plastic bags.

② There are 10 tomatoes. $\square$ tomatoes are distributed into each plastic bag. How many $\square$ are needed?

10 ÷ 5 = 2



① is a calculation to find the number in the box for 5 × $\square$ = 10.

② is a calculation to find the number in the box for $\square$ × 5 = 10.

Both answers can be calculated by the multiplication of 5 and 2 giving 10.

The Answer to a division problem can be calculated by using the multiplication table of divisor (In this case, 5)

10	÷	5	=	2
Dividend		Divisor		Answer

12 Let's make a story problem for 32 ÷ 8.

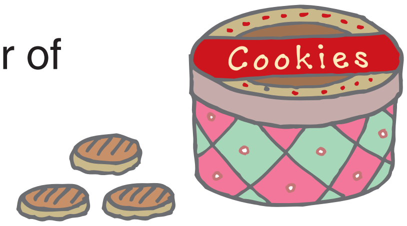
Exercise

Let's calculate the following divisions. Which column or row of the multiplication table will you use to find the answer?

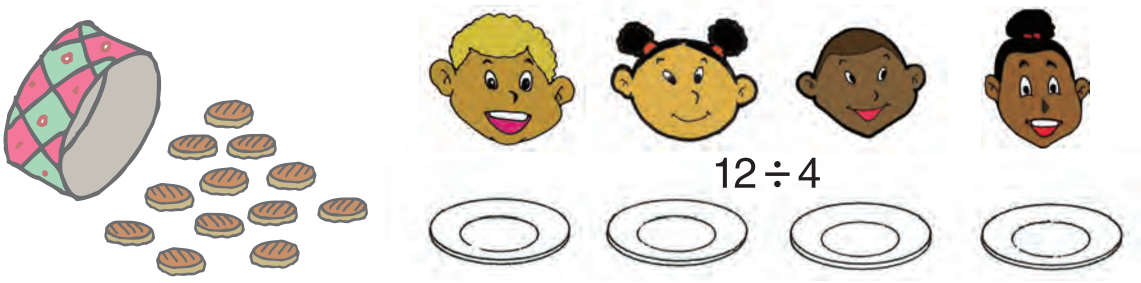
① 9 ÷ 3	② 24 ÷ 8	③ 10 ÷ 2	④ 32 ÷ 4	⑤ 35 ÷ 5
⑥ 6 ÷ 2	⑦ 36 ÷ 9	⑧ 45 ÷ 5	⑨ 14 ÷ 7	⑩ 48 ÷ 6
⑪ 20 ÷ 4	⑫ 56 ÷ 7	⑬ 48 ÷ 8	⑭ 40 ÷ 8	⑮ 81 ÷ 9

2 Division with 1 and 0

1 Cookies in a container will be shared by 4 children. Each one gets the same number of cookies. How many cookies will each person receive?



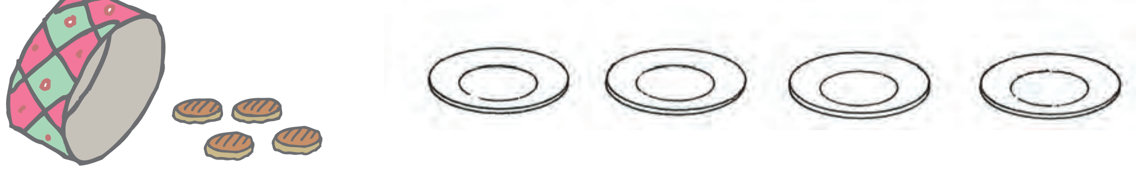
① If there are 12 cookies,



12÷4

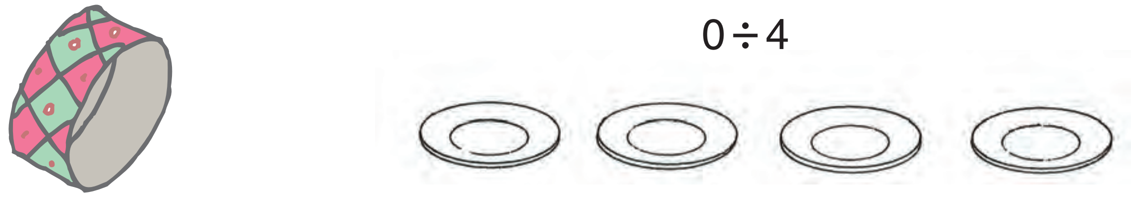
② If there are 4 cookies,

4÷4



③ If there are 0 cookies,

0÷4



2 There is a bottle of 6 dL juice. If you pour 1 dL per cup, how many cups do you need?

Exercise

① 6÷6　② 9÷9　③ 7÷7　④ 0÷5　⑤ 0÷8

⑥ 3÷1　⑦ 5÷1　⑧ 1÷1　⑨ 8÷1　⑩ 0÷1

③ Using Rules of Calculation

1 What is the answer for $36 \div 3$?

I will calculate using multiplication.

Let's line up the mathematical sentences of divisions in the case of divisor 3.

Vavi's idea

I use the relationship between division and multiplication.

$\boxed{1}\times 3 = 3 \rightarrow 3 \div 3 = \boxed{1}$	$\boxed{7}\times 3 = 21 \rightarrow 21 \div 3 = \boxed{7}$
$\boxed{2}\times 3 = 6 \rightarrow 6 \div 3 = \boxed{2}$	$\boxed{8}\times 3 = 24 \rightarrow 24 \div 3 = \boxed{8}$
$\boxed{3}\times 3 = 9 \rightarrow 9 \div 3 = \boxed{3}$	$\boxed{9}\times 3 = 27 \rightarrow 27 \div 3 = \boxed{9}$
$\boxed{4}\times 3 = 12 \rightarrow 12 \div 3 = \boxed{4}$	$\boxed{10}\times 3 = 30 \rightarrow 30 \div 3 = \boxed{10}$
$\boxed{5}\times 3 = 15 \rightarrow 15 \div 3 = \boxed{5}$	$\boxed{11}\times 3 = 33 \rightarrow 33 \div 3 = \boxed{11}$
$\boxed{6}\times 3 = 18 \rightarrow 18 \div 3 = \boxed{6}$	$\boxed{12}\times 3 = 36 \rightarrow 36 \div 3 = \boxed{12}$

From above, $36 \div 3 = 12$ Answer 12

Mero's idea

I line up division sentences of divisor 3.

$3 \div 3 = 1$	$21 \div 3 = 7$	If the dividend increases by 3, the answer will also increase by 1.
$6 \div 3 = 2$	$24 \div 3 = 8$	
$9 \div 3 = 3$	$27 \div 3 = 9$	
$12 \div 3 = 4$	$30 \div 3 = \square$	$30 \div 3 = 10$
$15 \div 3 = 5$	$33 \div 3 = \square$	$33 \div 3 = 11$
$18 \div 3 = 6$	$36 \div 3 = \square$	$36 \div 3 = 12$

From above, $36 \div 3 = 12$ Answer 12

Activity

Exercise

1 Let's divide.

Pages 84, 85, 88, 89

① $35 \div 7$	② $72 \div 9$	③ $18 \div 6$	④ $28 \div 4$
⑤ $12 \div 3$	⑥ $21 \div 3$	⑦ $20 \div 4$	⑧ $30 \div 5$
⑨ $64 \div 8$	⑩ $36 \div 6$	⑪ $8 \div 2$	⑫ $16 \div 2$
⑬ $81 \div 9$	⑭ $63 \div 7$	⑮ $42 \div 6$	⑯ $4 \div 1$
⑰ $8 \div 8$	⑱ $0 \div 2$	⑲ $69 \div 3$	⑳ $84 \div 4$

2 Let's find the number which applies to the $\square$.

Pages 84, 87

① $5 \times \square = 15$	② $7 \times \square = 35$
③ $3 \times \square = 24$	④ $9 \times \square = 36$
⑤ $\square \times 6 = 42$	⑥ $\square \times 3 = 9$
⑦ $\square \times 4 = 32$	⑧ $\square \times 8 = 48$

3 There are 28 cookies.

Page 86

① If you distribute 4 cookies to each friend, how many can each friend receive?

② If you distribute the same number of cookies to 4 friends, how many cookies can each friend receive?

Let's calculate.

Grade 3 Do you remember?

① 24×6	② 72×7	③ 56×8	④ 62×5
⑤ 284×3	⑥ 643×7	⑦ 206×9	⑧ 999×9

Problems

1 Distribute 36 sheets of coloured papers.

● Finding out how many to each person and how many persons.

① If you distribute the same number to 9 children, how many does one child get?

② If you distribute 9 papers to each child, how many children can receive?

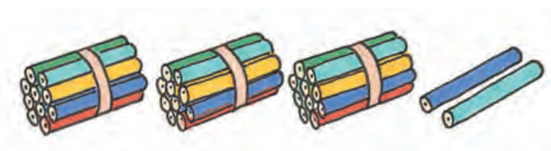
2 Let's calculate the following divisions.

● Using the multiplication table to calculate division.

① $27 \div 3$	② $30 \div 6$	③ $18 \div 2$	④ $56 \div 8$	⑤ $36 \div 4$
⑥ $20 \div 5$	⑦ $21 \div 7$	⑧ $63 \div 9$	⑨ $15 \div 5$	⑩ $42 \div 6$
⑪ $16 \div 4$	⑫ $49 \div 7$	⑬ $28 \div 7$	⑭ $54 \div 9$	⑮ $72 \div 8$
⑯ $7 \div 1$	⑰ $3 \div 3$	⑱ $0 \div 6$	⑲ $2 \div 1$	⑳ $5 \div 5$

3 Let's make a story problem for $32 \div 4$. Write a number or word which applies to the □.

● Making a story problem from expression.



①

<u>Division to Find the Number for Each</u>

There are □ pencils distributed to □ friends equally. How many pencils can □ receive?

②

<u>Division to Find the Number of Times</u>

There are □ pencils. □ pencils are distributed to each friend. How many □ can receive?

9 Division with Remainders

There are 20 apples and 23 oranges.

Put 4 of each type of fruits into separate bags.

1 Division with Remainders

1 There are 23 oranges. If you put 4 oranges into each bag, how many bags can you use?

① Write an expression.

☐ ÷ ☐

Total number　Number to each bag

This is a calculation distributing the same number to each unit, so we can use division.

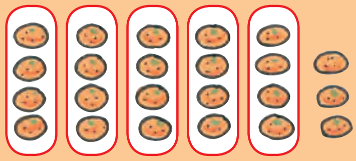
Is there any number that fit ☐ in 4 × ☐ = 23?

② Let's think about how to calculate.

Let's think about how to calculate divisions with remainders.

Sare's idea

I circled groups of 4 oranges.



Ambai's idea

I used the column of 4 in the multiplication table.

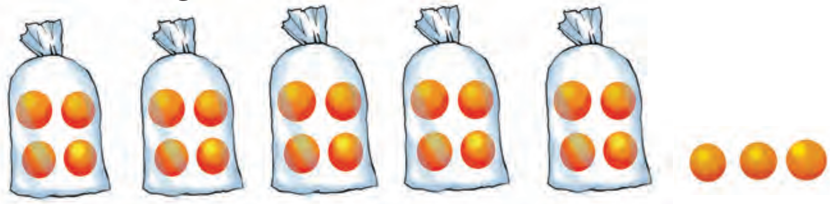
For 4 bags, $\boxed{4} \times 4 = 16$, 7 oranges remainder.

For 5 bags, $\boxed{5} \times 4 = 20$, 3 oranges remainder.

Total 23

For 6 bags, $\boxed{6} \times 4 = 24$, 1 orange short.

There are 5 bags and 3 remainders.

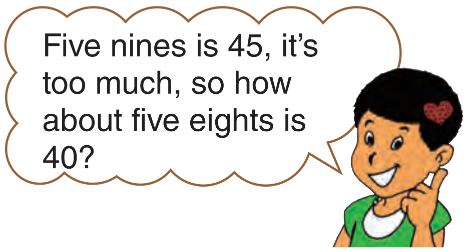


We will write this as follows: $23 \div 4 = 5$ remainder 3

Answer: 5 bags and a remainder of 3 oranges

As in $23 \div 4$, if we have a **remainder**, it is called **"not divisible"**. In other words, the dividend 23 is not divisible by divisor 4. In $20 \div 4$, if we have no remainder, it is called **"divisible"**. In other words, the dividend 20 is divisible by divisor 4.

2 There are 42 shells distributed to 5 children equally. How many will each child receive and what will be the remainder?



Exercise

There are 34 cards. If they give 6 cards to each child, how many children can receive cards and what is the remainder?

Divisor and the Size of Remainder

3 Division problems in which the divisor is 4 are lined up on the right. Let's write the correct numbers in the ☐.

The remainder in division should always be less than the divisor.

Dividend		Divisor		Answer	Remainder
12	÷	4	=	3	
11	÷	4	=	2	remainder 3
10	÷	4	=	2	remainder 2
9	÷	4	=	2	remainder 1
8	÷	4	=	2	
7	÷	4	=	1	remainder ☐
6	÷	4	=	1	remainder ☐
5	÷	4	=	1	remainder ☐
4	÷	4	=	1	
3	÷	4		☐	remainder ☐
2	÷	4		☐	remainder ☐
1	÷	4		☐	remainder ☐

How to Check Answers

4 You must fill 8 candies to each bag from 26 candies.

① How many bags will be filled and what is the remainder?

26 ÷ 8 = ☐ remainder ☐

② Let's consider how to calculate for confirming the answer for the above division.

3	×	8	+	2	=	☐
Number of bags		Number of candies to each bag		Remainder		Total number

Exercise

1 Fix the mistakes in the divisions below.

45 ÷ 6 = 6 remainder 9 55 ÷ 7 = 8 remainder 1

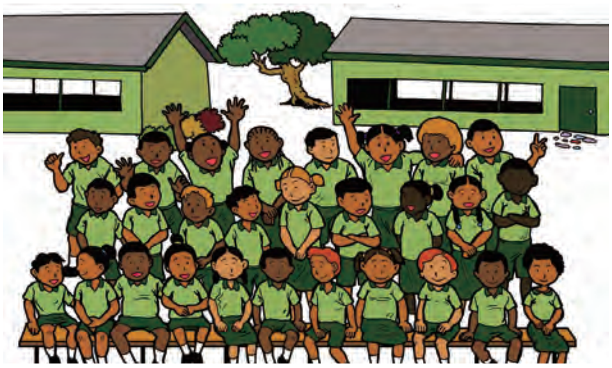
2 Solve the calculation below and check the answers.

① 7 ÷ 4 ② 22 ÷ 3 ③ 47 ÷ 9 ④ 50 ÷ 7 ⑤ 33 ÷ 5

2 Let's Solve Various Problems

1 There are 28 children in Saura's class.

If the class is divided into groups of 5 children, how many groups are made and what is the remainder?



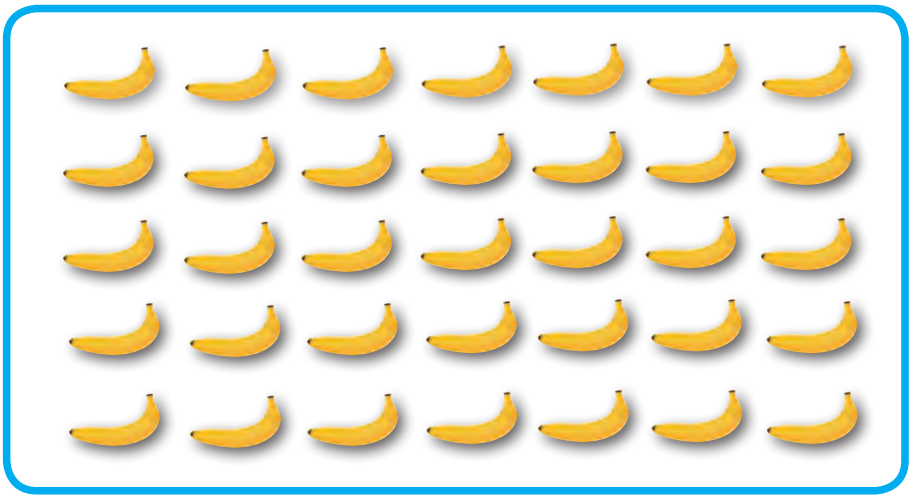
2 There are 40 balls.

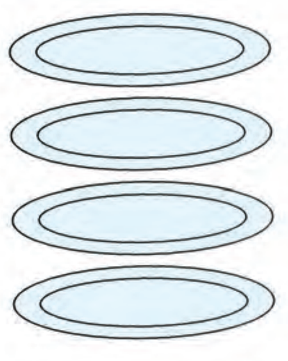
Bill wants to put 6 balls in each box.

How many boxes will he need?

Activity

3 Let's make the division problems with remainders.





There are ☐ bananas and ☐ plates. Put an equal number of bananas on each plate. How many bananas will be on each plate and what will be the remainder?

Exercise

1 Let's calculate and check the answers. Page 94

① $29 \div 3$ ② $36 \div 5$ ③ $17 \div 6$

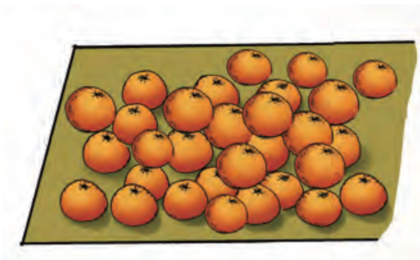
④ $43 \div 9$ ⑤ $34 \div 7$ ⑥ $55 \div 8$

2 There are 48 pencils. The same amount will be distributed to 7 children. How many pencils can be distributed to each child and what will be the remainder? Page 96

3 There are 66 cards. Pages 94 ~ 96

If the same amount is distributed to 9 children, how many cards will each child get and what will be the remainder?

If 9 cards are distributed to each child, how many children can receive and what will be the remainder?



4 There are 30 oranges. You will put these oranges in each plastic bag.

In each bag, 4 oranges can fit.

In order to put all the oranges in the plastic bag, how many plastic bags do you need? Page 96

Grade 3 **Do you remember?**

Solve the calculations below.

① $595 - 288$ ② $460 - 132$ ③ $906 - 742$

④ $892 - 625$ ⑤ $1234 - 695$ ⑥ $1006 - 759$

⑦ $5613 - 3424$ ⑧ $7411 - 5079$ ⑨ $9000 - 8021$

Problems

1 Let's find the mistakes in the following calculations?

Write the correct answer in the $\square$.

● Understanding the meaning of the division with remainder.

28÷3=8 remainder 4

$\square$

37÷5=8 remainder 3

$\square$

2 There are 46 tomatoes. They will be divided equally amongst 6 people.

● Considering the remainder depending on the story.

① How many tomatoes can be distributed to each person and what will be the remainder?

② How many more tomatoes do you need to distribute 8 to each person?

3 Let's calculate.

● Perform divisions with remainders.

① 33÷8	② 48÷5	③ 17÷4
④ 26÷7	⑤ 56÷9	⑥ 41÷6
⑦ 11÷2	⑧ 39÷7	⑨ 74÷9

4 There are 11 plastic bottles of juice in total. 4 plastic bottles of 2 L and 7 plastic bottles of 1 L. If you distribute equally amongst 3 people, what are the possible methods?

● Considering the various ways of distributions.

10 Circles and Spheres

We will play ring game. How should we line up for a fair game?

A, B and C are various formations. In each, which formation is fair for everybody?

Explain why you chose your answer.

Let's think about how we can have everybody at an equal distance to the target.

A

B

C

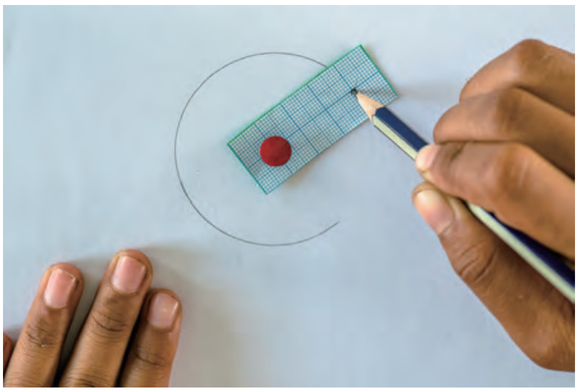
Activity

1 Circles

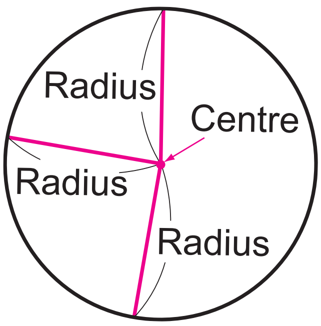
1 Let's think about how to draw a round shape.

① Draw many points that are all 3 cm from point A.

② Using an instrument below, draw a round shape.



A round shape that has the same distance from one point is called a circle. This point is called the centre.
The straight line from the centre to any point on the circle is called the radius.



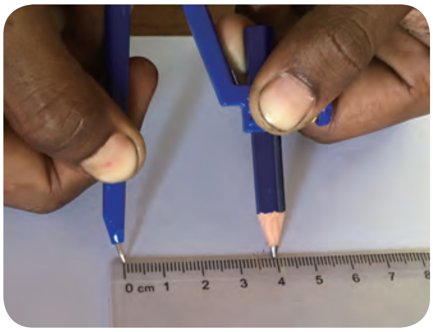
The circle you drew in **1** has a radius of 3 cm. Point A and the pin is the centre of the circle.

2 Let's draw a circle with a 2 m radius in the school ground using a rope.

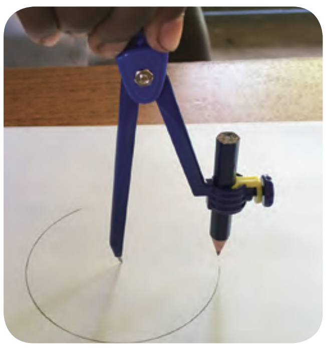
3 A compass is a tool used for drawing circles.

1 Draw a circle with a 4 cm radius using a compass.

① Open the compass to the length of the radius.



② Rotate the compass to draw a circle.



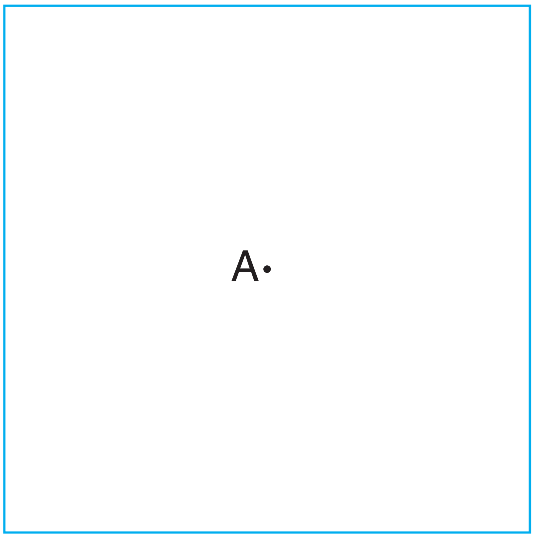
2 Draw another circle with a different radius and the same centre.

Radius and Diameter

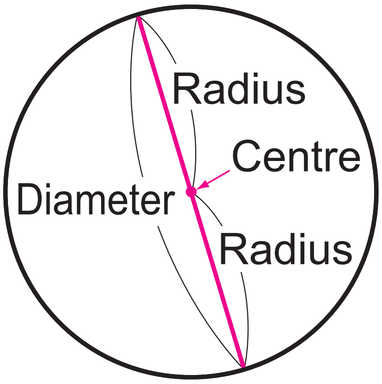
4 Draw a circle with A as the centre.

① Draw a circle with radius of 3 cm.

② Draw a straight line from one side of the circle to the other through the centre.



A straight line drawn from one point on the circle passing through the centre of the circle to the other point on the circle is called the diameter.
The lenght of the diameter is twice the length of the radius.



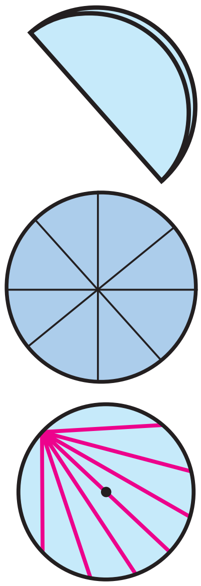
5 Let's fill in the blanks with correct words and numbers.

① A diameter is ☐ times the radius.

② If you fold a circle along its ☐, there are two equal sections.

③ There are many diameters in a circle and all diameters have the ☐ length.

④ ☐ is the longest straight line between two points in the circle.

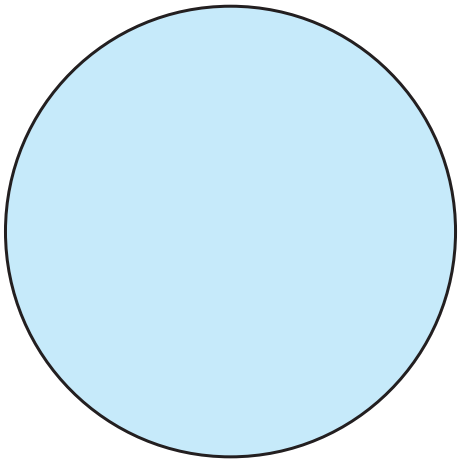


Exercise

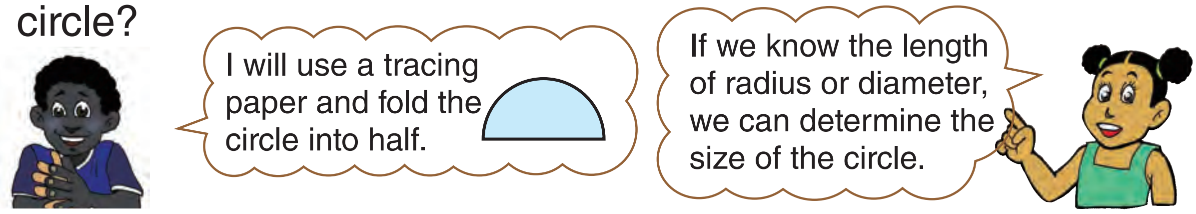
Draw circles with the following diameters.

① 8 cm ② 12 cm ③ 14 cm

6 Draw a circle that is the same size as the circle on the right using a compass.

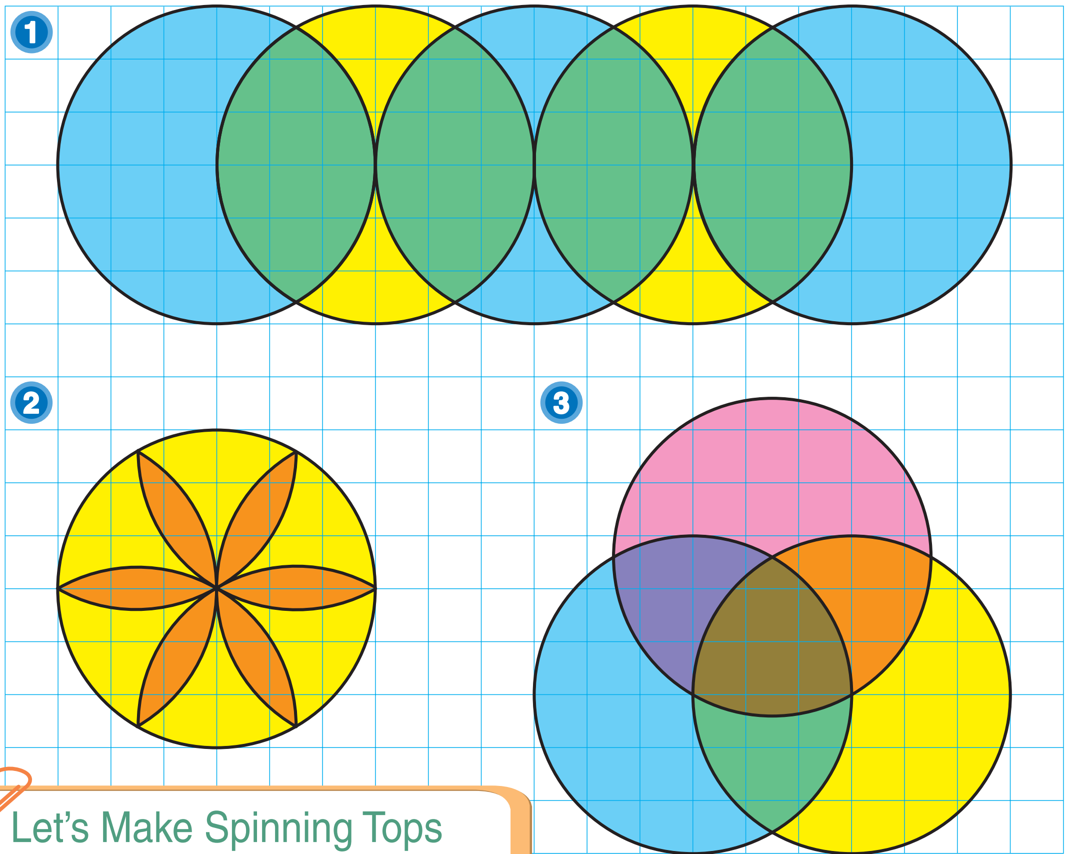


1. What do you need to have for drawing the circle?
2. How can you find the centre of the circle?



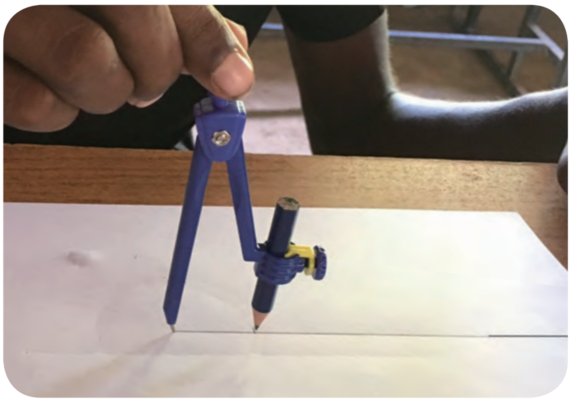
Designing Patterns

7 Let's draw different patterns and pictures using a compass.



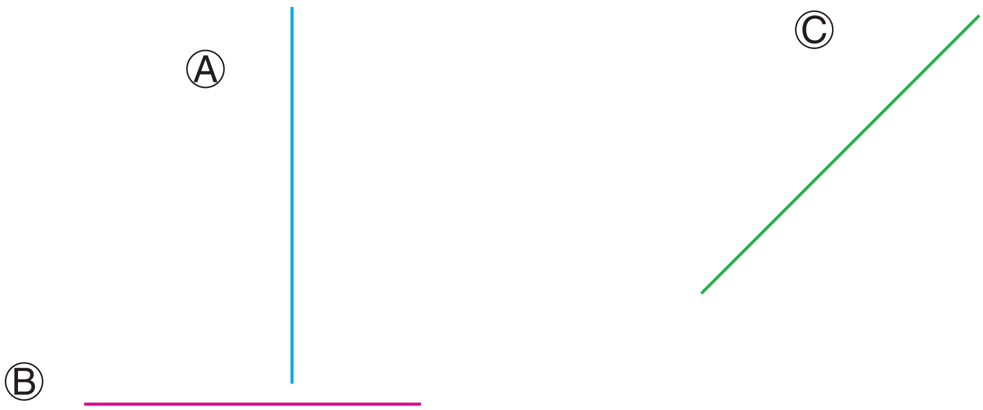
Functions of a Compass

A compass can be used for other purposes other than drawing a circle.

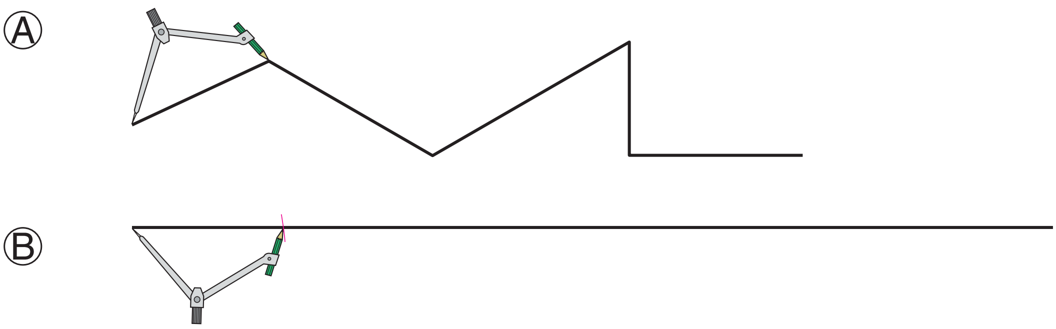


① You can divide a straight line into sections of the same length. Try making 3 cm sections on the line below.

② You can compare the lengths of Ⓐ, Ⓑ and Ⓒ. Which of these straight lines is the longest?

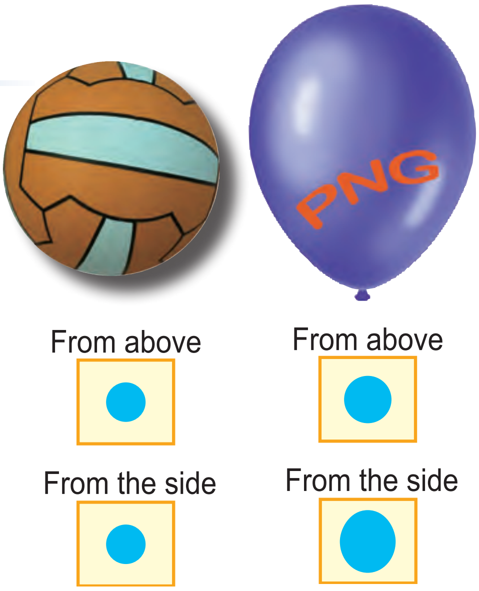


③ You can transfer lengths. Transfer line Ⓐ to line Ⓑ. How long is line Ⓐ compared with line Ⓑ.



② Spheres

1 Explore the shape of a ball.



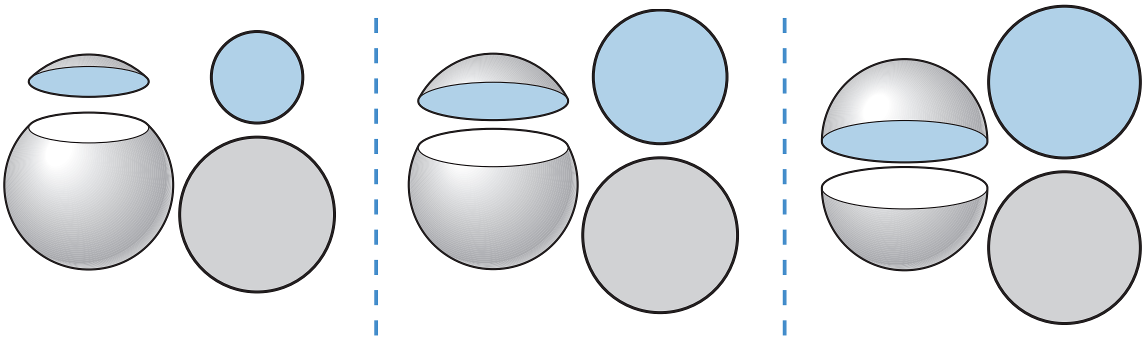
① What is the shape of the ball when viewed from the above and the side?

② Roll a ball.

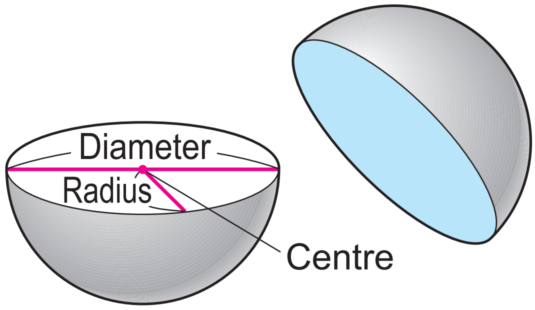
An object that looks like a circle from any direction is called a **sphere**.

③ Look for things shaped like a sphere.

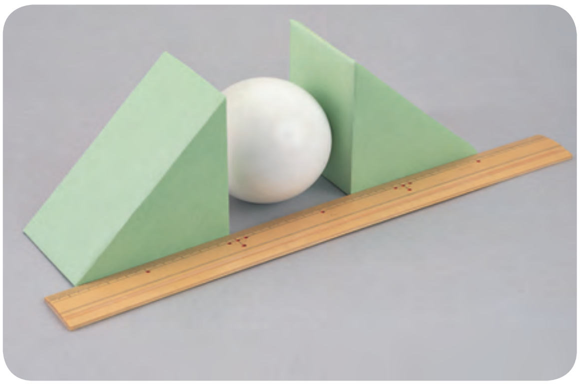
④ What is the shape of the cross-section of a sphere?
Where should we cut to make the largest cross-section from a sphere?



When a sphere is cut in half, the centre, the radius, and the diameter of the cross-sections are called the **centre, radius and diameter** of the sphere.



❺ How can we find the diameter of a sphere?



Let's Find Circles and Spheres

Let's look for things shaped like circles and spheres.

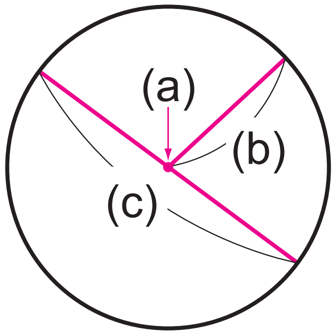
Can you find the centre and the radius of these?

Floats for fishing net

Exercise

1 Answer these questions about the circle shown on the right.

Page 100



① What is point (a) called?

② What is the name given to the straight lines (b) and (c) ?

2 Write the correct words or numbers in the □.

Page 102

① A straight line through the centre between 2 points on a circle is called □.

② The length of a diameter is □ times the radius.

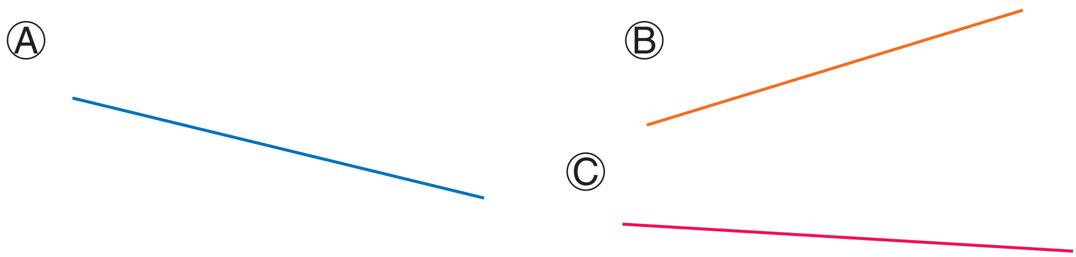
3 Draw the following circles.

Pages 101, 104

① A circle with a diameter of 4 cm.

② A circle with a radius of 4 cm.

4 Compare the lengths of the following straight lines.



Let's fill in the boxes.

Grade 2 Do you remember?

① 10 mm = □ cm ② □ cm = 1 m

③ 1dL = □ mL ④ 2000 mL = □ L

Problems

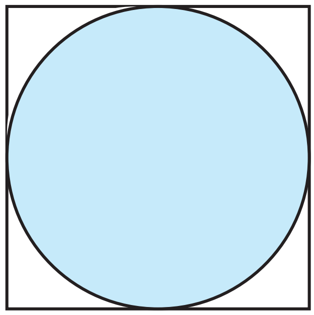
1 Draw the following circles.

● Drawing circles with a given radius or diameter.

① A circle with a 6 cm radius.

② A circle with a 10 cm diameter.

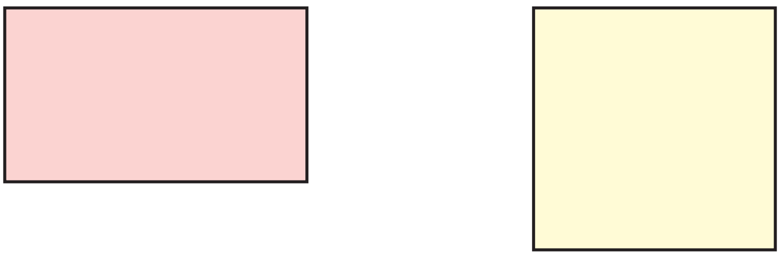
2 A circle is put in a square of the same size as shown on the right.
Find its radius and draw another circle of the same size.



● Understanding the properties of a diameter.

3 Which is longer around its edges, the rectangle or the square? Find the answer by using a compass.

● Understanding how to compare the lengths of lines by using a compass.



4 There are 3 circles of the same size below. Find the diameter of one of these circles.

● Understanding the radius and diameter of combined circles.