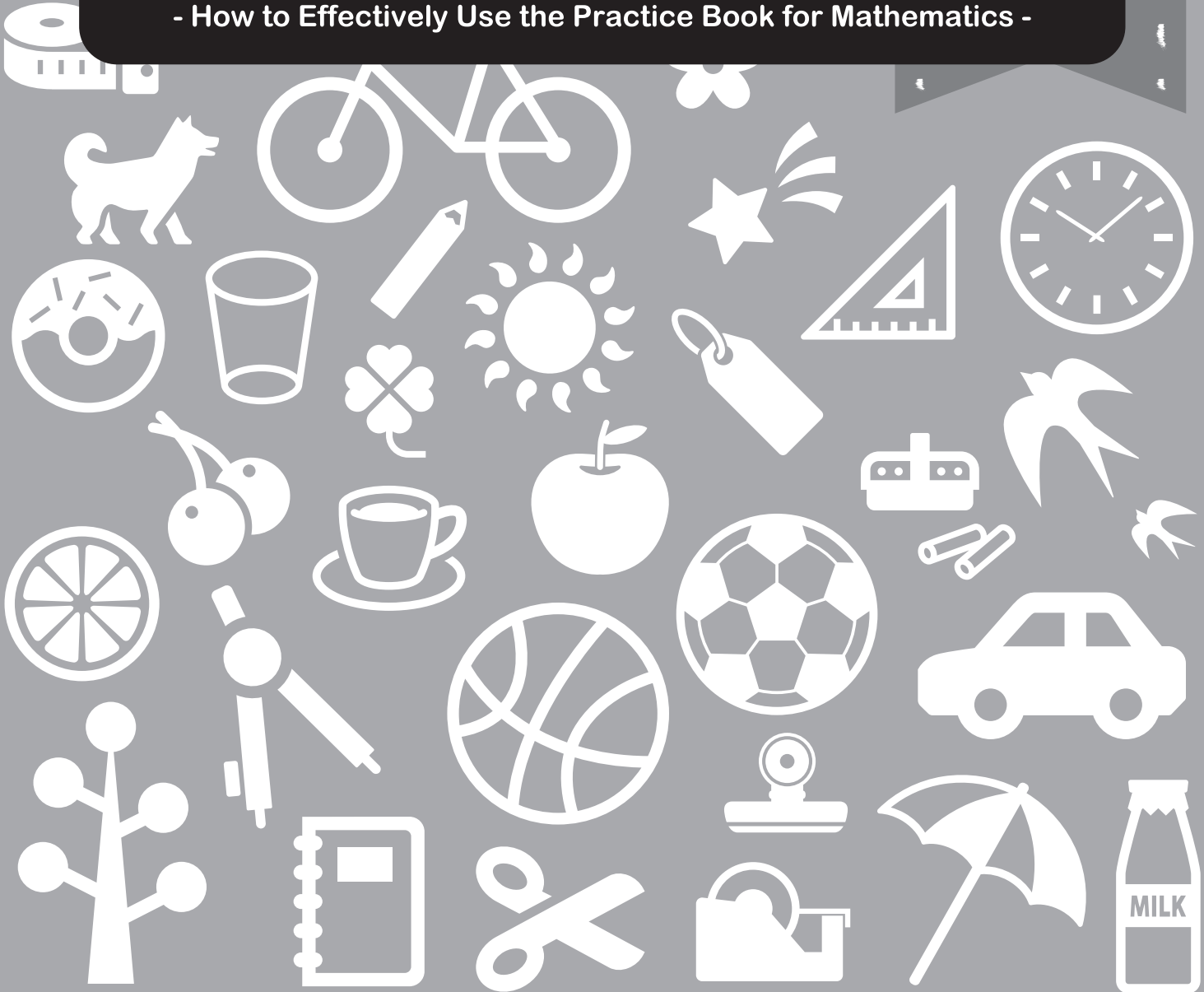


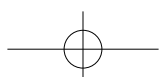
# Practice Book for Mathematics

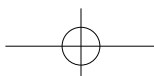
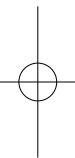
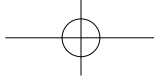
## Instruction Manual

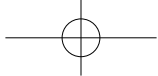
- How to Effectively Use the Practice Book for Mathematics -



Japan International  
Cooperation Agency





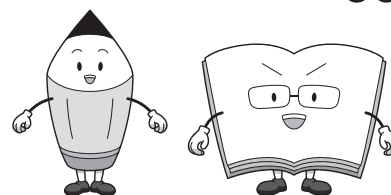


# INSTRUCTION MANUAL

## How to Use the Practice Book for Mathematics Effectively

### Table of Contents

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# Purpose

This Practice Book for Mathematics was developed by the Japan International Cooperation Agency (JICA) in 2021 for the following purposes:

- (1) To utilize this Practice Book's mathematics problems when revising current textbooks or developing new mathematics textbooks with JICA's support.
- (2) To utilize this Practice Book for distance education, supplementary lessons in addition to regular education lessons, and to aid individual learning by learners.
- (3) To utilize for independent learning during school closures due to COVID-19.

# Contents

## Coverage

This Practice Book for Mathematics covers all of the contents that are taught at the elementary level in Japan. It was developed based on the Japanese Elementary Education Curriculum for Mathematics that is also known as "Course of Study" in Japan (issued in 2017 by the Japanese Ministry of Education, Culture, Sports, Science and Technology <MEXT>). It consists of 6 books in total, one for each grade (grades 1 to 6).

## Main Content for Each Grade

The contents of this book consist of the following five areas:

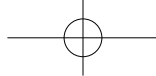
- 1) Number & Operation (NUM)
- 2) Measurement (MEA)
- 3) Geometry (GEO)
- 4) Change & Relation (CHA)
- 5) Data Utilization (DAT)

In order to make it easier to understand which area each unit covers, each area is assigned a colour. The table of contents uses these different colours to differentiate each area from each other.

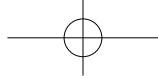
NUM	blue
MEA	greens
GEO	purple
CHA	pink
DAT	orange

Practice Book for Mathematics	
Grade 3 Table of Contents	
<b>1 Properties of Multiplication</b> .....	<b>2</b>
Properties of Multiplication (1), (2), (3), Finding the Numbers, Various Ways for Calculation, Multiplication with 0, Multiplication by 10 and 100, Review	
<b>2 Time Points and Time Intervals</b> .....	<b>12</b>
How to Find Time Points (1), (2), Shorter Time, Making Time Problems, Review	
<b>3 Addition and Subtraction</b> .....	<b>19</b>
Addition (1), (2), (3), (4), Subtraction (1), (2), (3), (4), (5), Mental Arithmetic (1), (2), Addition of Three Numbers, Review	
<b>4 Division</b> .....	<b>32</b>
How Many for Each Person?, How Many People?, Making Division Problems, Divide 0 and Divide by 1, Calculation for Finding Times as Much, Divide a Large Number (1), (2), Review	
<b>5 Length</b> .....	<b>41</b>
Tape Measure, Direct Distance and Travel Distance, Units of Long Length, Various Units of Length, Review	
<b>6 Tables and Bar Graphs</b> .....	<b>46</b>
Data Organization, Bar Graphs (1), (2), Organizing Data Using Tables, Review	

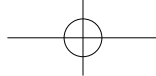
The main content covered by each grade are as follows:



	<b>Number &amp; Operation (NUM)</b>	<b>Measurement (MEA)</b>	<b>Geometry (GEO)</b>	<b>Change &amp; Relation (CHA)</b>	<b>Data Utilization (DAT)</b>
<b>Grade 1</b>	<ul style="list-style-type: none"> <li>• Numbers and their structure</li> <li>• Addition and subtraction</li> </ul>	<ul style="list-style-type: none"> <li>• Direct and indirect comparisons among objects</li> <li>• Reading the time</li> </ul>	<ul style="list-style-type: none"> <li>• Characteristics of objects</li> </ul>		<ul style="list-style-type: none"> <li>• Expressing amount of objects with pictures</li> </ul>
<b>Grade 2</b>	<ul style="list-style-type: none"> <li>• Number scale notation</li> <li>• Simple fractions</li> <li>• Addition and subtraction using 2- and 3-digit numbers</li> <li>• Multiplication</li> </ul>	<ul style="list-style-type: none"> <li>• Length and various units</li> <li>• Weight and various units</li> </ul>	<ul style="list-style-type: none"> <li>• Various triangles</li> <li>• Rectangles</li> </ul>		<ul style="list-style-type: none"> <li>• Simple tables and graphs</li> </ul>
<b>Grade 3</b>	<ul style="list-style-type: none"> <li>• Large numbers</li> <li>• Times 10, 100, and 1000</li> <li>• Times one tenth</li> <li>• Addition and subtraction using 3- and 4-digit numbers</li> <li>• Multiplication and division</li> <li>• Decimal numbers</li> <li>• Fractions</li> <li>• Math sentence using <math>\square</math></li> </ul>	<ul style="list-style-type: none"> <li>• Various units of length and weight (the metric system)</li> <li>• Time point and interval</li> </ul>	<ul style="list-style-type: none"> <li>• Triangles (equilateral triangle and isosceles triangle)</li> <li>• Angle</li> <li>• Circle</li> <li>• Sphere</li> </ul>		<ul style="list-style-type: none"> <li>• Data collection and arrangement</li> <li>• Bar graphs</li> </ul>



<p><b>Grade</b> 4</p>	<ul style="list-style-type: none"> <li>• Large numbers</li> <li>• Rounding numbers</li> <li>• Division</li> <li>• Decimal numbers and operation</li> <li>• Fractions and operation (addition and subtraction)</li> <li>• Properties of operation</li> </ul>		<ul style="list-style-type: none"> <li>• Plane figures (parallelogram, rhombus, and trapezoid)</li> <li>• Solid figures (cuboid and cube)</li> <li>• Expressing the position of objects</li> <li>• Area of plane figures and units</li> <li>• Size of angles</li> </ul>	<ul style="list-style-type: none"> <li>• Changing amounts</li> <li>• Line graph</li> <li>• Simple ratio</li> </ul>	<ul style="list-style-type: none"> <li>• Data arrangement from two points of view</li> <li>• Expressing data using a line graph</li> </ul>
<p><b>Grade</b> 5</p>	<ul style="list-style-type: none"> <li>• Even and odd numbers</li> <li>• Multiples and factors</li> <li>• Addition and subtraction of decimal numbers</li> <li>• Addition and subtraction of fractions</li> <li>• Relation between fractions and decimal numbers</li> </ul>		<ul style="list-style-type: none"> <li>• Congruence</li> <li>• Polygons and their characteristics</li> <li>• Solid figures (prism and cylinder)</li> <li>• Area of triangles, parallelograms, rhombuses and trapezoids</li> <li>• Volume of objects</li> </ul>	<ul style="list-style-type: none"> <li>• Proportional relationship</li> <li>• Size per unit</li> <li>• Ratio and percentage</li> </ul>	<ul style="list-style-type: none"> <li>• Pie chart and band chart</li> <li>• Average of data</li> </ul>
<p><b>Grade</b> 6</p>	<ul style="list-style-type: none"> <li>• Multiplication and division of fractions</li> <li>• Math sentence using letters</li> </ul>		<ul style="list-style-type: none"> <li>• Reduced and enlarged views</li> <li>• Symmetric shapes</li> <li>• Area of a circle</li> <li>• Volume of prisms and cylinders</li> </ul>	<ul style="list-style-type: none"> <li>• Proportional and inverse proportional relationships</li> <li>• Ratio</li> </ul>	<ul style="list-style-type: none"> <li>• Data analysis</li> <li>• Expressing data using tables and graphs</li> <li>• Probability</li> </ul>



Note: The above Elementary Education Curriculum for Mathematics of Japan (the Course of Study for mathematics) emphasizes the systematic nature of learning contents so that learners can actively tackle new problems while using what they have already learned. In addition, the 2017 curriculum also emphasizes the well-balanced development of competencies and capabilities such as acquisition of knowledge and skills, thinking ability, judgement and expressive skills, etc. that are necessary for future learning.

\*The details are shown in the APPENDIX (Detailed Contents) at the end of this booklet.

## Structure

### (1) One section consists of one to three learning contents.

In each section of this Practice Book for Mathematics, there are “Example” and “Exercises”. In addition, “Instruction” is provided before each “Example” to explain key points when it is necessary.

### Instruction

“Instruction” is included only when the learning content is complex and difficult for learners. In this “Instruction”, the main points of the content are described in a concise and easy-to-understand manner. Reading and understanding this part will help learners solve the exercises covered in these sections.

### Example

Typical exercises dealt with in the section are used as examples and detailed explanations are given on how to solve these problems. All the exercises covered in the section can be solved using the solutions presented in the examples.

### Exercises

There are various numbers of exercises depending on the section. The first problem is the same as the content dealt with in the “Example”, but the numerical values are slightly different. Therefore, learners can solve this first problem by using the same mathematical operations as in the “example”. However, as the exercises progress, the content becomes more complicated and requires more thinking ability.

In addition, even if learners have some problems understanding what they have already learned, they can still learn new content by following the “Example” and doing the “Exercises”.

**14 - 6**    Decimal Numbers

**Decimal Numbers and Fractions**

**Instruction** The decimal numbers and fractions match the following.

Decimal numbers can be converted to fractions and fractions can be converted to decimal numbers.

For example, 0.6 is made of **six (6) 0.1's**. In other words, it is made of **six (6)  $\frac{1}{10}$** . So, 0.6 is  $\frac{6}{10}$ .

$\frac{7}{10}$  is made of **seven (7)  $\frac{1}{10}$** . In other words, it is made of **seven (7) 0.1's**. So,  $\frac{7}{10}$  is 0.7.

**Example** Which numbers is greater, 0.4 or  $\frac{3}{10}$ ?

0.4 is made of **four (4) 0.1's ( $\frac{1}{10}$ )**. So, 0.4 is  $\frac{4}{10}$ .

$\frac{3}{10}$  is made of **three (3)  $\frac{1}{10}$  (0.1's)**. So,  $\frac{3}{10}$  is 0.3.

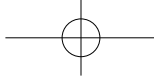
Answer 0.4  $\frac{4}{10}$  **>**  $\frac{3}{10}$

Compare the following two numbers and write the appropriate sign (< or >) in the  $\square$ .

①  $0.8 \square \frac{7}{10}$     ②  $0.5 \square \frac{6}{10}$     ③  $1.2 \square \frac{11}{10}$

④  $\frac{14}{10} \square 1.5$     ⑤  $\frac{23}{10} \square 2.4$     ⑥  $\frac{35}{10} \square 3.1$

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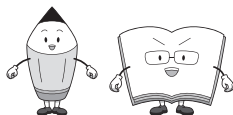
## (2) In each chapter, the “Review” is prepared.

In every chapter, there are several “Review” sections. In small chapters, there is usually one “Review” section. In larger chapters, there are two or three “Review” sections.

### Review

This “Review” section is to confirm how well learners understand what they have learned so far. It covers all of the main contents of that chapter. Depending on the results of this “Review”, it is possible to determine whether learners can proceed or whether they should review the content once gain.

Two characters, a Textbook Teacher and a Pencil Assistant Teacher, provide hints and possible ways to solve a problem when necessary. Learners can refer to these hints and solutions while studying.



**14-18** Decimal Numbers

**Review**

1 What is the length of the tape and what is the amount of the water? Write the numbers in the .

1 L

1 L

2 Look at the following number line. What are the numbers for (1) to (4)? How many 0.1's are in each number?

1 Number  How many 0.1's     2 Number  How many 0.1's

3 Number  How many 0.1's     4 Number  How many 0.1's

3 Compare the following two numbers and write the appropriate sign (< or >) in the .

1  $0.7$    $0.5$     2  $1.9$    $2$     3  $0.8$    $\frac{9}{10}$

4 Calculate the following problems by using the algorithm.

1  $0.4 + 0.1$     2  $1.5 + 0.7$     3  $2.8 + 5.4$     4  $0.8 + 0.2$   
 5  $6.3 + 1.7$     6  $5.6 + 3.5$     7  $7.6 - 4.2$     8  $2.7 - 0.9$   
 9  $8.1 - 7.9$     10  $3 - 1.6$     11  $4 - 3.8$     12  $18.7 - 9.8$

1	2	3	4
5	6	7	8
9	10	11	12

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## (3) The “Entire Grade Review” sections are at the end of each book.

In every Practice Book for Mathematics, there is an “Entire Grade Review” section for helping learners review what they have learned during one year.

### Entire Grade Review

This is a section at the end of each Practice Book for Mathematics. Its purpose is to confirm the degree of understanding of all the contents learned in that grade. This “Entire Grade Review” consists of a two-page spread for each area, such as “number & operation”, “measurement”, “geometry”, “change & relation” and “data utilization”.

**Number & Operation**

**Entire Grade-3 Review (1)**

1 Calculate the following problems by using the algorithm.

1  $351 + 574$     2  $526 + 179$     3  $347 + 658$     4  $4876 + 1129$

5  $832 - 458$     6  $305 - 178$     7  $5746 - 3789$     8  $7006 - 957$

2 Calculate the following problems by using the algorithm.

1  $94 \times 4$     2  $141 \times 6$     3  $506 \times 5$     4  $385 \times 8$

5  $27 \times 25$     6  $39 \times 50$     7  $304 \times 27$     8  $452 \times 29$

3 Calculate the following division problems.

1  $64 \div 8 = \square$     2  $42 \div 6 = \square$     3  $70 \div 7 = \square$     4  $84 \div 4 = \square$

5  $46 \div 7 = \square$  R     6  $52 \div 9 = \square$  R     7  $76 \div 8 = \square$  R

4 Calculate the following problems.

1  $1.3 + 0.6$     2  $2.7 + 4.5$     3  $1.9 - 0.5$     4  $8 - 4.7$

5  $\frac{1}{5} + \frac{3}{5} = \square$     6  $\frac{7}{8} + \frac{1}{8} = \square$     7  $\frac{6}{7} - \frac{3}{7} = \square$     8  $1 - \frac{3}{10} = \square$

5 Write the numbers in the .

1     2     3

4  is made of 3 ten thousands, 5 hundreds and 2 ones.

5  is made of 4 1's (ones) and 8 0.1's.

6  is made of 27 0.1's.

6 Compare the following two numbers and write the appropriate sign (< or >) in the .

1  $0.8$    $\frac{7}{10}$     2  $0.1$    $0$     3  $\frac{9}{10}$    $1$     4  $\frac{5}{10}$    $0.6$

7 There are two tapes, red and blue. The length of the red tape is 24 cm. The length of blue tape is 8 cm. How many times as long as is the red tape as the blue tape?

Math Sentence  Answer  times

8 There are 40 oranges. We are going to put all oranges in boxes, 6 oranges per box. How many boxes do we need?

Math Sentence  Answer  boxes

172 173

8

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## (4) There is a “Diagnostic Review” section in the Practice Book for Mathematics for Grade 6.

Practice Book for Mathematics for Grade 6 has the “Diagnostic Review” sections for supporting learners to understand their comprehension levels about entire learning contents for 6 years elementary education.

### Diagnostic Review

The “Diagnostic Review” is at the end of grade 6. It is used to confirm how much learners have learned during the 6 years of elementary mathematics education. There are a total of five diagnostic tests. Each test covers the five areas of “number & operation”, “measurement”, “geometry”, “change & relation” and “data utilization”. Each test

**Power up!**  
**Diagnostic Review 1**

**1** Calculate the following problems.

①  $326 + 674$     ②  $613 - 36$     ③  $53 \times 46$     ④  $204 \div 6$   
 ⑤  $34 + 9 \times 5$     ⑥  $96 - 81 \div 9$     ⑦  $46 - (30 - 19)$     ⑧  $17 + (45 - 6 \times 7)$   
 ⑨  $4.8 + 2.3$     ⑩  $50.8 + 7.34$     ⑪  $7.6 - 5.3$     ⑫  $9.152 - 8.72$

①	②	③	④
⑤	⑥	⑦	⑧
⑨	⑩	⑪	⑫

**2** Write the correct numbers in the .

①  $0.8 + 7.6 = \square + 0.8$     ②  $\frac{1}{2} \times \frac{3}{5} = \frac{3}{5} \times \square$   
 ③  $(198 + 84) + 16 = 198 + (\square + 16)$     ④  $(3.2 \times 0.25) \times 4 = 3.2 \times (\square \times 0.25)$   
 ⑤  $9 \div 8 + 4.2 \div 8 = (9 + \square) \div 8$     ⑥  $10 \times (1.2 - \frac{9}{10}) = 10 \times 1.2 - 10 \times \square$   
 ⑦  $(\frac{1}{2} + \frac{1}{4}) \times 8 = \frac{1}{2} \times 8 + \square \times 8$     ⑧  $5 \times \frac{8}{9} - 4 \times \frac{8}{9} = (5 - 4) \times \square$

①	②	③	④
⑤	⑥	⑦	⑧

**3** Answer the following questions.

① What is 2 hundred millions, 8 one millions, and 5 ten thousands?  
 ② How many 1000s are there in 357000?  
 ③ What is 7 0.1's and 8 0.01's?  
 ④ How many 0.01 are there in 2.64?  
 ⑤ What is  $\frac{2}{3}$  times 3?

①	②	③	④	⑤
---	---	---	---	---

**4** Look at the following figures and fill in the table below.

Name	Right triangle	Isosceles triangle	Pentagon	Hexagon	Circle
Answer					
Name	Trapezoid	Rectangle	Square	Parallelogram	Rhombus
Answer					

**5** Read the lengths of the on the tape measures below.

A is  m  cm.  
 B is  m  cm.

**6** Match the same capacities with a line.

①	<input type="checkbox"/>	500 mL
②	<input type="checkbox"/>	1 L 20 mL
③	<input type="checkbox"/>	120 mL

**7** The time is 9:15 now. Write the time points that shows the following times.

① 30 minutes after    ② 3 hours before

It is     It is

is a two-pages spread. Learners who have completed all the chapters in this Practice Book for Mathematics will use these to determine their overall comprehension of elementary school level mathematics.

## Type of Problems

The content of each chapter is divided into small steps so that the learners can study by themselves. For example, the explanation of the multiplication algorithm in the third grade is divided into 12 steps. In each chapter, the learners can understand the multiplication algorithm and therefore solve any types of multiplication problems by themselves.

In addition, interesting and unique problems are included so learners can proceed with their learning while having fun. To give a few examples, the learners colour in the oranges whose answer is 13 that is shown on the right. (p.94, grade 1), they arrange three number cards; “2”, “3” and “7” and makes the

**10 - 7**    Addition    **Find the Formula**

**Example** Colour in the oranges whose answer is 14.

Colour in the oranges whose answer is 13.

There are different types of formula to make 13. Line up the formula by order and find the rule.

Example of Unique Problem (grade1)

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largest and second largest numbers possible (p.57, grade 2). The subtraction problems of “321-123”, “543-345” and “756-567” whose answers are always “198” (p.24, grade 3). They write math symbols (+, -, ×, ÷) in the ○ to make the math sentence correct, such as “4○3○2○1=2”, “4○3○2○1=3” and “4○3○2○1=4” (p.95, grade 4). They choose five number cards among the seven cards; “0”, “1”, “3”, “4”, “6”, “7” and “9”, and make various decimal numbers of “□□.□□□” (p.7, grade 5). They choose some math multiplication problems which can be calculated easily by using the properties of operations (p.35, grade 6).

Furthermore, there is content that focuses on understanding (Knowing Level), content that focuses on utilization of knowledge (Applying Level) and content that focuses on reasoning (Reasoning Level) in each section. These contents are composed of problems corresponding to any of the three cognitive areas. Learners can learn while solving problems increasing the difficulty level. This classification of the cognitive domains of “Knowing Level”, “Applying Level” and “Reasoning Level” is used widely in TIMSS (Trends in International Mathematics and Science Study) held by the IEA (International Association for the Evaluation of Educational Achievement).

## Points to Keep in Mind When Using the Practical Book for Mathematics

### (1) Notation in bold letters

In this book, there are some parts written in bold. The parts in bold refer to important mathematical terms when they are first introduced. Therefore, it is important for learners to understand these terms. There are also some parts that are written in bold in order to emphasize them and make it easier to understand the concept being explained.

### (2) Number notation

In this book, all numbers are written using the notation method used in Japanese mathematics textbooks. It is called “textbook font”. Chapter 1 “How Many?” of grade 1 of this book introduces the notation method and the stroke order.

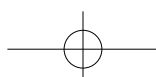
However, the notation of numbers differs slightly depending on the country. When using this book, it is important to match the notation method used by that country. In particular, “1”, “4” and “7” are points to be noted.

Number Notation Used in This Book

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

### (3) Distinguishing between math sentence and algorithm

In this book, the algorithm (a calculation method using the vertical form) is distinguished from the





ordinal math sentences and is introduced as a convenient and effective method for calculation. This is the same for all operations including addition (grade 2), subtraction (grade 2), multiplication (grade 3), and division (grade 4).

Example of Math Sentence and Algorithm (Vertical Form)

$31 + 19 = 50$	$\begin{array}{r} 31 \\ + 19 \\ \hline 50 \end{array}$
Ordinal Math Sentence	Algorithm (Vertical Form)

#### (4) Multiplication

In this book, multiplication is described as the "Number of objects in each group" × "Number of groups". As a general rule,  $2 \times 3$  should be read as "2 multiplied by 3". In some countries, it may be read as 2 times 3. In this case, the word "times" indicates only "multiplication". Therefore, the multiplication table is written as  $2 \times 1$ ,  $2 \times 2$ ,  $2 \times 3 \dots$ , and is read as "two (2) multiplied by three (3) is six (6)". This is then abbreviated as "two three is six". Multiplication phrases such as, "two (2) per group, three (3) groups make a total of six (6)" are used. This is only used for explaining how to solve multiplication problems.

In addition, the symbol for and method of multiplication differ slightly from country to country. Therefore, when using this book, it is necessary to modify the multiplication symbol and algorithm according to that used in mathematics education in that country.

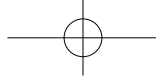
#### (5) Division symbols and division algorithm

The symbol for division ( $\div$  and  $:$ ) and method of division differ slightly from country to country. In this book, the division symbol of " $\div$ " is used and the " $\overline{\hspace{1cm}}$ " is used as the division algorithm method. These are widely used in Japanese mathematics education.

Therefore, when using this book, it is necessary to modify the division symbol and division algorithm according to that used in mathematics education in that country.

Examples of Different Division Algorithm Methods

$\begin{array}{r} 5 \\ 3 \overline{) 17} \\ \underline{15} \\ 2 \end{array}$	$\begin{array}{r} 3 \overline{) 17} (5 \\ \underline{15} \\ 2 \end{array}$	$\begin{array}{r} 17 \overline{) 3} \\ \underline{15} \\ 2 \end{array}$	$\begin{array}{r} 17 \overline{) 5} \\ \underline{15} \\ 2 \end{array}$	$3 \overline{) 17} \setminus 5 \\ \underline{15} \\ 2 \end{array}$
Japan	India	Brazil	Portugal	Netherland



## (6) Notation of large numbers

In this book, when writing large numbers, they are written without any marks. This is the method used in Japanese mathematics education. However, in some countries commas ( , ), periods ( . ) or spaces are used every three digits to make large numbers easier to read (1,234,567”, “1.234.567” or “1 234 567”).

When using this book, it is necessary to adjust the notation of numbers according to the large number notation used in mathematics education in that country.

Examples of Notation of Large Numbers

Notation Methods	Characteristics	Main Countries and Areas
123,456,789	Comma every 3 digits	China, Japan, UK, USA, etc.
123.456.789	Period every 3 digits	France, Germany, Italy, Spain, Russia, etc.
123 456 789	Space	International System of Units (SI)
12,34,56,789	Comma in the third digit, then every 2 digits	India, Myanmar, etc.

## (7) Decimal points

In this book, a period ( . ) is used as the decimal point. This is the method used in Japanese mathematics education. However, the notation of the decimal points differs from country to country, with various notations being used such as a comma ( , ), period ( . ), middle dot ( · ) and Momayez ( , , ).

When using this book, it is necessary to adjust the decimal notation according to that used in mathematics education in that country.

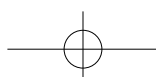
Examples of Notation of Decimal Points

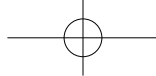
Notation Methods	Main Countries and Areas
Period ( . )	India, China, Japan, UK, USA, etc. (This is called as the British Practice)
Comma ( , )	France, Germany, Italy, Spain, Russia, etc. (This is called as the French Practice)
Middle dot ( · )	UK (until 1970s), Japan (in the special case)
Momayez ( , , )	Arabic countries, etc.

## (8) Area (length × width)

“Vertical length × Horizontal length” is widely used in Japanese mathematics education as a formula for calculating the area of a square or rectangle. However, in English-speaking countries, the longer length is called the “length” and the shorter length is called the “width”. This is the method used in this book.

When using this book, it is necessary to adjust the general formula according to that used in mathematics education in that country.





## (9) Measurement units

In this book, the lengths are “mm”, “cm”, “m” and “km” based on the metric system used in Japanese mathematics education. Area is “km<sup>2</sup>”, “m<sup>2</sup>”, “cm<sup>2</sup>”, “ha” and “a”. Volume is “m<sup>3</sup>”, “cm<sup>3</sup>”, “L”, “dL” and “mL”. Weight is “kg”, “g” and “mg”.

The metric system is currently used as the standard in most countries. However, in some countries, such as Japan, use some of those units, while others, such as French-speaking countries, use all metric units. In addition, customary units which have been used for a long time in the country are often also used in mathematics education.

When using this book, it is necessary to adjust the units used in the measurement unit according to that used in mathematics education in that country.

Examples of the Metric System

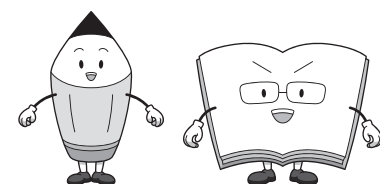
	k(kilo) × 1000	h(hecto) × 100	da(deca) × 10	Base unit 	d(dec) × 1/10	c(centi) × 1/100	m(milli) × 1/1000
Units of Length	km	(hm)	(dam)	m	(dm)	cm	mm
Units of Weight	kg	(hg)	(dag)	g	(dg)	(cg)	mg
Units of Volume	(kL)	(hL)	(daL)	L	dL	(cL)	mL

Note: Units without the parentheses is used in this book.

## (10) Unit of currency

Different monetary units are used in different countries. This book contains mathematic problems dealing with the price of items. In this book, a currency unit of “zed (s)” is used as a virtual currency unit. This virtual currency unit has also been used in mathematic problems in international mathematics tests such as TIMSS (The Trends in International Mathematics and Science Study) and PISA (The Programme for International Students Assessment).

When using this book, it is fine to use the “zed (s)”, but using the actual currency unit used in each country is highly recommended to make the problems easier to understand. Therefore, when using this book, it is important to convert the monetary unit to that used in that country.



# Appendix (Detailed Contents)

## Explanation of abbreviations

“Level” in the table is shown by three stages, “K”, “A” and “R”, which have been indicated in TIMSS.

K: knowledge Level

A: Application Level

R: Reasoning Level

Note: In order to learn and understand thoroughly the basic contents, this book provides many K-level problems. On the other hand, it selects R-level problems carefully.

## Grade 1

Area	Level	Chapter	Section	Page
Number & Operation	K	1. How Many?	1-1. Numbers to Five (1)	2-3
	K		1-2. Numbers to Five (2)	4
	K		1-3. Numbers to Five (3)	5
	K		1-4. Numbers from Six to Ten (1)	6-7
	K		1-5. Numbers from Six to Ten (2)	8
	K		1-6. Numbers from Six to Ten (3)	9
	K		1-7. Numbers to Ten (1)	10
	K		1-8. Numbers to Ten (2)	11
	K		1-9. Numbers to Ten (3)	12
	K		1-10. Counting (1)	13
	K		1-11. Counting (2)	14
	K		1-12. Zero	15
	K		1-13. Review	16-17
Number & Operation	K	2. How Many & How Many?	2-1. Five	18
	K		2-2. Six	19
	K		2-3. Seven	20
	K		2-4. Eight	21
	K		2-5. Nine	22
	K		2-6. Ten (1)	23
	K		2-7. Ten (2)	24
	K		2-8. Make Ten (1)	25
	K		2-9. Make Ten (2)	26
	K		2-10. Review	27
Number & Operation	K	3. Adding Together and Adding More	3-1. Adding Together (1)	28-29
	K		3-2. Adding Together (2)	30
	K		3-3. Adding More (1)	31
	K		3-4. Adding More (2)	32
	K		3-5. Addition (1)	33
	K		3-6. Addition (2)	34
	K		3-7. Review (1)	35
	K		3-8. Review (2)	36
	K		3-9. Review (3)	37
Number & Operation	K	4. What is Left?	4-1. What is Left? (1)	38-39
	K		4-2. What is Left? (2)	40
	K		4-3. What is Left? (3)	41
	K		4-4. Subtraction (1)	42
	K		4-5. Subtraction (2)	43
	K		4-6. 0 (Nothing Left)	44



	K		4-7. Math Sentence	45
	K		4-8. Review	46-47
Number & Operation	K	5. What is the Difference?	5-1. What is the Difference? (1)	48-49
	K		5-2. What is the Difference? (2)	50
	K		5-3. What is the Difference? (3)	51
	K		5-4. Review (1)	52
	K		5-5. Review (2)	53
Number & Operation	K	6. Numbers Greater than 10	6-1. 10 to 20 (1)	54
	K		6-2. 10 to 20 (2)	55
	K		6-3. 10 to 20 (3)	56
	K		6-4. 10 and How Many	57
	K		6-5. Number Line	58
	K		6-6. Numbers that is ( ) More than ( )	59
	K		6-7. Numbers that is ( ) Less than ( )	60
	K		6-8. Larger and Smaller Numbers	61
	A		6-9. Count and Find the Numbers	62
	K		6-10. Addition and Subtraction (1)	63
	K		6-11. Addition and Subtraction (2)	64
	K		6-12. Review (1)	65
	A		6-13. Review (2)	66
Measurement	K	7. What Time is It?	7-1. Hour	67
	K		7-2. Half-Hour	68-69
	K		7-3. Review	70-71
Geometry	K	8. Playing with Shapes	8-1. Various Shapes (1)	72
	K		8-2. Various Shapes (2)	73-74
	K		8-3. Various Shapes (3)	75
	K		8-4. Review	76-77
Number & Operation	K	9. Calculation of Three Numbers	9-1. Addition of Three Numbers	78-79
	K		9-2. Subtraction of Three Numbers	80-81
	K		9-3. Addition & Subtraction of Three Numbers	82-83
	A		9-4. Calculation of Three Numbers	84
	A		9-5. Making Questions (1)	85
	A		9-6. Making Questions (2)	86
	K A		9-7. Review	87
Number & Operation	K	10. Addition	10-1. Addition (9+?)	88
	K		10-2. Addition (8+?)	89
	K		10-3. Addition (7+?)	90
	K		10-4. Find the Answer	91
	K		10-5. Addition of Two Numbers (1)	92
	K		10-6. Addition of Two Numbers (2)	93
	A		10-7. Find the Formula	94
	K		10-8. Review	95
Number & Operation	K	11. Subtraction	11-1. Subtraction (10-?)	96
	K		11-2. Subtracting 9 (1)	97
	K		11-3. Subtracting 9 (2)	98
	K		11-4. Subtracting 8	99
	K		11-5. Subtracting 7	100
	K		11-6. Explanation about How to Calculate	101
	K		11-7. Subtraction (1)	102
	K		11-8. Subtraction (2)	103



	K		11-9. Review	104-105
Measurement	K	12. How to Compare (Length)	12-1. Which One is Longer? (1)	106-107
	K		12-2. Which One is Longer? (2)	108
	K		12-3. Which One is Longer? (3)	109
	K		12-4. Which One is Longer? (4)	110
	K		12-5. Which One is Longer? (5)	111
	K		12-6. Review	112-113
Measurement	K	13. How to Compare (Capacity)	13-1. Which is More? (1)	114
	K		13-2. Which is More? (2)	115
	K		13-3. Review	116-117
Measurement	K	14. How to Compare (Extent)	14-1. Which is Larger? (1)	118
	K		14-2. Which is Larger? (2)	119
	K		14-3. Review	120-121
Number & Operation	K	15. Large Numbers	15-1. Numbers Greater than 20 (1)	122
	K		15-2. Numbers Greater than 20 (2)	123
	K		15-3. Numbers Greater than 20 (3)	124
	K		15-4. Numbers Greater than 20 (4)	125
	K		15-5. Numbers Greater than 20 (5)	126
	K		15-6. Review (1)	127
	K		15-7. Numbers Greater than 99	128
	K		15-8. Arrangement of Numbers (1)	129
	K		15-9. Arrangement of Numbers (2)	130
	K		15-10. Arrangement of Numbers (3)	131
	K		15-11. Arrangement of Numbers (4)	132
	K		15-12. Arrangement of Numbers (5)	133
	K		15-13. Numbers Greater than 100 (1)	134
	K		15-14. Numbers Greater than 100 (2)	135
	K		15-15. Review (2)	136
	K		15-16. Addition and Subtraction (1)	137
	K		15-17. Addition and Subtraction (2)	138
	K		15-18. Addition and Subtraction (3)	139
	K		15-19. Review (3)	140
Measurement	K	16. What Time is It? (Hours and Minutes)	16-1. How to Read the Time (1)	141
	K		16-2. How to Read the Time (2)	142
	K		16-3. Review	143
Number & Operation	K	17. Ordinal Numbers	17-1. First to Fifth	144-145
	K		17-2. Sixth to Tenth	146-147
	K		17-3. Ordinal Numbers to Tenth	148-149
	A		17-4. Ordinal Numbers and How Many (1)	150-151
	A		17-5. Ordinal Numbers and How Many (2)	152-153
	K A		17-6. Review	154-155
Number & Operation	A	18. Let's Use Diagrams	18-1. Calculations Including the Ordinal Number (1)	156-157
	A		18-2. Calculations Including the Ordinal Number (2)	158-159
	A		18-3. Calculations Including the Ordinal Number (3)	160
	A		18-4. Review (1)	161
	A		18-5. Calculations to Think about the Difference (1)	162





	A	18-6. Calculations to Think about the Difference (2)		163
	A	18-7. Calculations to Think about the Difference (3)		164
	A	18-8. Review (2)		165
Geometry	K	19-1. Making Various Shapes	19. Making Shapes	166
	K	19-2. Drawing Various Shapes		167
	K	19-3. Review		168
Data Utilization	K	20-1. Let's Express Quantity with Drawings	20. How to Express Quality	169
Number & Operation	K A	21. Entire Grade-1 Review (1) (Number & Operation)		170-171
Geometry	K A	22. Entire Grade-1 Review (2) (Geometry)		172-173
Measurement	K A	23. Entire Grade-1 Review (3) (Measurement)		174-175
Data Utilization	K	24. Entire Grade-1 Review (4) (Data Utilization)		176-177
		Appendix: Addition and Subtraction Problems		178-179

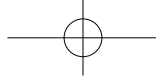


## Grade 2

Area	Level	Chapter	Section	Page
Data Utilization	K	1. Tables and Graphs	1-1. Let's Make a Table and Draw a Graph	2-3
	K		1-2. Finding What a Graph Shows	4-5
	K		1-3. Review	6-7
Number & Operation	K	2. Addition	2-1. Addition Algorithm (1)	8
	K		2-2. Addition Algorithm (2)	9
	K		2-3. Addition Algorithm (3)	10
	K		2-4. Addition Algorithm (4)	11
	K		2-5. Review (1)	12
	K		2-6. Addition Algorithm (5)	13
	K		2-7. Addition Algorithm (6)	14
	K		2-8. Addition Algorithm (7)	15
	K		2-9. Addition Algorithm (8)	16
	K		2-10. Addition Problems	17
	K		2-11. Review (2)	18-19
Number & Operation	K	3. Subtraction	3-1. Subtraction Algorithm (1)	20
	K		3-2. Subtraction Algorithm (2)	21
	K		3-3. Subtraction Algorithm (3)	22
	K		3-4. Review (1)	23
	K		3-5. Subtraction Algorithm (4)	24-25
	K		3-6. Subtraction Algorithm (5)	26
	K		3-7. Subtraction Algorithm (6)	27
	K		3-8. Properties of Subtraction	28
	K		3-9. Subtraction Problems	29
	K		3-10. Review (2)	30-31
Measurement	K	4. Units of Length	4-1. Centimetre (1)	32
	K		4-2. Centimetre (2)	33
	K		4-3. Millimetre	34
	K		4-4. Drawing Straight Lines	35
	K		4-5. Addition of Lengths	36
	K		4-6. Subtraction of Lengths	37
	K		4-6. Converting Units of Lengths	38
	K		4-7. Review	39
Measurement	K	5. Time Points and Time Intervals	5-1. How to Read the Time Intervals	40-41
	K		5-2. A.M. and P.M.	42-43
	K		5-3. Units of Time	44-45
	K		5-4. Review	46-47
Number & Operation	K	6. Numbers Greater than 100	6-1. How to Express Numbers	48
	K		6-2. Structure of Numbers	49
	K		6-3. Finding the Numbers on the Number Line	50-51
	K		6-4. One Thousand (1000)	52
	K		6-5. Addition with Tens and Hundreds	53
	K		6-6. Subtraction with Tens and Hundreds	54
	K		6-7. Comparing Numbers	55
	A		6-8. Making Numbers	56
	K A		6-9. Review	57
Number & Operation	K	7. Addition and Subtraction	7-1. Addition Algorithm (1)	58-59



	K		7-2. Addition Algorithm (2)	60-61
	K		7-3. Addition Algorithm (3)	62
	K		7-4. Addition Algorithm (4)	63
	K		7-5. Addition Algorithm (5)	64
	A		7-6. Addition Problems	65
	K		7-7. Subtraction Algorithm (1)	66
	K		7-8. Subtraction Algorithm (2)	67
	K		7-9. Subtraction Algorithm (3)	68
	K		7-10. Subtraction Algorithm (4)	69
	K		7-11. Subtraction Algorithm (5)	70
	A		7-12. Subtraction Problems	71
	K A		7-13. Review	72-73
Measurement	K	8. Capacity of Water	8-1. Litre	74
	K		8-2. Decilitre	75
	K		8-3. Millilitre	76
	A		8-4. Units of Capacity (1)	77
	A		8-5. Units of Capacity (2)	78
	A		8-6. Addition and Subtraction of Capacities	79
	K A		8-7. Review	80
Geometry	K	9. Triangles and Quadrilaterals	9-1. Straight Lines	81
	K		9-2. Finding Triangles and Quadrilaterals	82
	K		9-3. Triangles	83
	K		9-4. Quadrilaterals	84
	K		9-5. Right Angle	85
	K		9-6. Rectangles	86-87
	K		9-7. Squares	88-89
	K		9-8. Right Triangles	90-91
	K		9-9. Review	92-93
Number & Operation	K	10. Multiplication-1	10-1. Meaning of Multiplication (1)	94
	K		10-2. Meaning of Multiplication (2)	95
	K		10-3. Multiplication Facts of 5 (1)	96
	A		10-4. Multiplication Facts of 5 (2)	97
	K		10-5. Multiplication Facts of 2 (1)	98
	A		10-6. Multiplication Facts of 2 (2)	99
	K		10-7. Multiplication Facts of 5 and 2	100
	K		10-8. Multiplication Facts of 3 (1)	101
	A		10-9. Multiplication Facts of 3 (2)	102
	K		10-10. Multiplication Facts of 4 (1)	103
	A		10-11. Multiplication Facts of 4 (2)	104
	K		10-12. Multiplication Facts of 2 and 3	105
	K		10-13. Multiplication facts of 2, 3 and 5	106
	K		10-14. Multiplication Facts of 2 and 4	107
	K		10-15. Multiplication Facts of 3 and 4	108
	K A		10-16. Review	109
Number & Operation	K	11. Multiplication-2	11-1. Multiplication Facts of 6 (1)	110
	A		11-2. Multiplication Facts of 6 (2)	111
	K		11-3. Multiplication Facts of 7 (1)	112
	A		11-4. Multiplication Facts of 7 (2)	113
	K		11-5. Multiplication Facts of 6 and 7	114
	K		11-6. Multiplication Facts of 8 (1)	115



	A		11-7. Multiplication Facts of 8 (2)	116
	K		11-8. Multiplication Facts of 9 (1)	117
	A		11-9. Multiplication Facts of 9 (2)	118
	K		11-10. Multiplication Facts of 1	119
	K		11-11. Multiplication Facts of 8 and 9	120
	K		11-12. Multiplication Facts of 7 and 8	121
	K		11-13. Multiplication Facts of 4 and 7	122
	A		11-14. Multiplication Problems	123
	A		11-15. Times as Much and Multiplication	124
	K		11-16. The Multiplication Table (1)	125
	K		11-17. The Multiplication Table (2)	126
	A R		11-18. Making Multiplication Problems	127
	A R		11-19. Problems	128-129
	K A R		11-20. Review	130-131
Measurement	K	12. Length of Long Objects	12-1. Units of Length	132
	K		12-2. Addition of Lengths	133
	K		12-3. Subtraction of Lengths	134
	K		12-4. Calculation of Lengths (1)	135
	K		12-5. Calculation of Lengths (2)	136
	K		12-6. Review	137
Geometry	K	13. Shapes of Boxes	13-1. Let's Make Boxes (1)	138-139
	K		13-2. Let's Make Boxes (2)	140-141
	K		13-3. Review	142-143
Number & Operation	K	14. Numbers Greater than 1000	14-1. How to Express Numbers	144-145
	K		14-2. Structure of Numbers (1)	146-147
	K		14-3. Structure of Numbers (2)	148
	K		14-4. Comparing Numbers	149
	A		14-5. Making Numbers	150
	K		14-6. Number Line	151
	K		14-7. Addition with Hundreds	152-153
	K		14-8. Subtraction with Hundreds	154-155
	K A		14-9. Review	156-157
Number & Operation	A	15. Let's Think about Using Diagrams	15-1. Using Diagrams (1)	158-159
	A R		15-2. Using Diagrams (2)	160-161
	A R		15-3. Review	162-163
Number & Operation	K	16. Describing the Size of Divided Parts	16-1. One Half	164-165
	K		16-2. One Fourth	166
	K		16-3. One Eighth	167
	A		16-4. Original Size and Fractions	168-169
	K A		16-5. Review	170-171
Number & Operation	K A R	17. Entire Grade-2 Review (1) (Number & Operation)		172-173
Geometry	K	18. Entire Grade-2 Review (2) (Geometry)		174-175
Measurement	K A	19. Entire Grade-2 Review (3) (Measurement)		176-177
Data Utilization	K	20. Entire Grade-2 Review (4) (Data Utilization)		178-179

## Grade 3

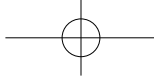
Area	Level	Chapter	Section	Page
Number & Operation	K	1. Properties of Multiplication	1-1. Properties of Multiplication (1)	2-3
	K		1-2. Properties of Multiplication (2)	4
	K		1-3. Properties of Multiplication (3)	5
	K		1-4. Finding the Numbers	6
	K		1-5. Various Ways for Calculation	7
	K		1-6. Multiplication with 0	8
	K		1-7. Multiplication by 10 and 100	9
	K		1-8. Review	10-11
Measurement	K	2. Time Points and Time Intervals	2-1. How to Find Time Points (1)	12-13
	K		2-2. How to Find Time Points (2)	14-15
	A		2-3. Shorter Time	16
	A		2-4. Making Time Problems	17
	K A		2-5. Review	18
Number & Operation	K	3. Addition and Subtraction	3-1. Addition (1)	19
	K		3-2. Addition (2)	20
	K		3-3. Addition (3)	21
	K		3-4. Addition (4)	22
	K		3-5. Subtraction (1)	23
	K		3-6. Subtraction (2)	24
	K		3-7. Subtraction (3)	25
	K		3-8. Subtraction (4)	26
	K		3-9. Subtraction (5)	27
	A		3-10. Mental Arithmetic (1)	28
	A		3-11. Mental Arithmetic (2)	29
	A		3-12. Addition of Three Numbers	30
	K A		3-13. Review	31
Number & Operation	K	4. Division	4-1. How Many for Each Person?	32-33
	K		4-2. How Many People?	34
	K		4-3. Making Division Problems	35
	K		4-4. Divide 0 and Divide by 1	36
	K		4-5. Calculation for Finding Times as Much	37
	K		4-6. Divide a Large Number (1)	38
	K		4-7. Divide a Large Number (2)	39
	K		4-8. Review	40
Measurement	K	5. Length	5-1. Tape Measure	41
	K		5-2. Direct Distance and Travel Distance	42
	K		5-3. Units of Long Length	43
	K		5-4. Various Units of Length	44
	K		5-5. Review	45
Data Utilization	K	6. Tables and Bar Graphs	6-1. Data Organization	46-47
	K		6-2. Bar Graphs (1)	48-49
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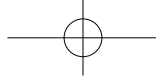
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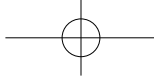
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