Practice Book for Mathematics

Answer Book

Grade 3

JICA

Japan International Cooperation Agency

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1 - 1 Properties of Multiplication

Properties of Multiplication (1)

1 Complete the following multiplication table.

Multipliers

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

Do you remember the multiplication facts? Fill the blank with the results of multiplication of multiplicands and multipliers.

Example Write the numbers in the □.

1. The answer to 7 × 4 is 7 larger than 7 × 3.

	1	2	3	4	5
7	7	14	21		35

7 7 7 7

When the multiplier increased by 1, the answer increases by the multiplicand.

7 × 4 = 7 × 3 + 7

2. The answer to 7 × 4 is 7 smaller than 7 × 5.

	1	2	3	4	5
7	7	14	21		35

7 7 7 7

When the multiplier decreases by 1, the answer decreases by the multiplicand.

7 × 4 = 7 × 5 − 7

2 Write the numbers in the □.

1. The answer to 7 × 5 is 7 larger than 7 × 4.
2. The answer to 7 × 5 is 7 smaller than 7 × 6.
3. The answer to 3 × 4 is 3 larger than 3 × 3.
4. The answer to 3 × 4 is 3 smaller than 3 × 5.
5. The answer to 5 × 3 is 5 larger than 5 × 2.
6. The answer to 4 × 8 is 4 smaller than 4 × 9.

3 Write the numbers in the □.

1. 7 × 5 = 7 × 4 + 7
2. 7 × 5 = 7 × 6 − 7
3. 3 × 4 = 3 × 3 + 3
4. 3 × 4 = 3 × 5 − 3
5. 5 × 3 = 5 × 2 + 5
6. 4 × 8 = 4 × 9 − 4
7. 8 × 6 = 8 × 7 − 8
8. 6 × 7 = 6 × 6 − 6

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1 - 2 Properties of Multiplication

Properties of Multiplication (2)

Example Look at the multiplication table and answer the following questions.

1. Find the multiplication math sentence that has the same answer as 7 × 4.

7 × 4 = 4 × 7 = 28

2. Find the multiplication math sentence that has the same answer as 9 × 3.

9 × 3 = 3 × 9 = 27

When the order of the multiplicand and the multiplier is switched, the answer remains the same.

Multipliers

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

Find the multiplication math sentences that have the same answers as the following sentences. Then find the answers.

1. 7 × 5 = 5 × 7 = 35
2. 9 × 4 = 4 × 9 = 36
3. 2 × 9 = 9 × 2 = 18
4. 4 × 6 = 6 × 4 = 24
5. 6 × 3 = 3 × 6 = 18
6. 5 × 8 = 8 × 5 = 40
7. 1 × 5 = 5 × 1 = 5
8. 3 × 2 = 2 × 3 = 6
9. 8 × 4 = 4 × 8 = 32
10. 9 × 7 = 7 × 9 = 63
11. 2 × 7 = 7 × 2 = 14
12. 6 × 5 = 5 × 6 = 30

1 - 3 Properties of Multiplication

Properties of Multiplication (3)

Example Write the numbers in the □.

8 × 6
- 5 × 6 = 30
- 3 × 6 = 18

Altogether 48

8 × 6 = 5 × 6 + 3 × 6

In multiplication, even if the **multiplicand** is divided up and calculated, the answer is still the same.

In multiplication, even if the **multiplier** is divided up and calculated, the answer is also the same.

Write the numbers in the □.

1. 9 × 6
   - 5 × 6 = 30
   - 4 × 6 = 24

   Altogether 54

   9 × 6 = 5 × 6 + 4 × 6
2. 6 × 8
   - 3 × 8 = 24
   - 3 × 8 = 24

   Altogether 48
3. 8 × 9
   - 4 × 9 = 36
   - 4 × 9 = 36

   Altogether 72
4. 7 × 4
   - 5 × 4 = 20
   - 2 × 4 = 8

   Altogether 28
5. 9 × 5
   - 6 × 5 = 30
   - 3 × 5 = 15

   Altogether 45

1 - 4 Properties of Multiplication
Finding the Numbers

Example Write the numbers in the □.

1 6 × 4 = 24　　2 5 × 3 = 15

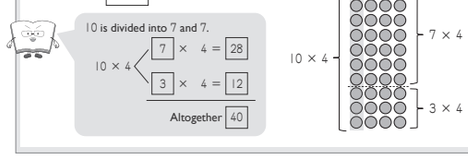
Write the numbers in the □.

1 6 × 8 = 48　　2 7 × 3 = 21
3 5 × 2 = 10　　4 9 × 5 = 45
5 4 × 4 = 16　　6 2 × 8 = 16
7 3 × 7 = 21　　8 6 × 3 = 18
9 5 × 2 = 10　　10 3 × 4 = 12
11 4 × 8 = 32　　12 7 × 7 = 49
13 8 × 5 = 40　　14 9 × 6 = 54

1 - 5 Properties of Multiplication
Various Ways for Calculation

Example 1 Calculate the following multiplication problems.

10 × 4 = 40

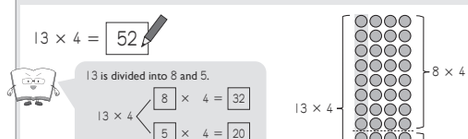


1 Calculate the following multiplication problems.

1 10 × 5 = 50　　2 10 × 3 = 30　　3 10 × 8 = 80

Example 2 Calculate the following multiplication problems.

13 × 4 = 52



2 Calculate the following multiplication problems.

1 14 × 4 = 56　　2 11 × 6 = 66　　3 12 × 5 = 60
4 17 × 3 = 51　　5 16 × 2 = 32　　6 15 × 3 = 45

1 - 6 Properties of Multiplication
Multiplication with 0

Example Calculate the following multiplication problems.

1 7 × 0 = 0
2 0 × 7 = 0

When a number is multiplied by 0, the answer is always 0.

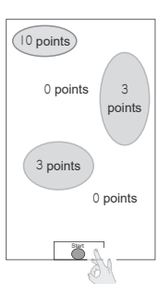
Also, even when 0 is multiplied by a number, the answer is always 0.

1 Calculate the following multiplication problems.

1 8 × 0 = 0　　2 3 × 0 = 0
3 0 × 16 = 0　　4 29 × 0 = 0

2 I played a scoring game. The score is the point written where the coin is stopped by flipping the coin with my finger. As a result of doing 1 times, the results were as follows. Calculate the total of my scores.

Where the coin stopped (points)	Number of coin stopped (times)	Score (points)
10	1	
3	4	
0	5	
Total Score		



Math sentence

10 × 1 = 10
3 × 4 = 12
0 × 5 = 0
10 + 12 + 0 = 22

Answer 22 points

1 - 7 Properties of Multiplication
Multiplication by 10 and 100

Example 1 Calculate the following multiplication problems.

20 × 3 = 60

2 × 3 = 6
↓ 10 times　↓ 10 times
20 × 3 = 60

When the multiplicand is multiplied by 10, the answer is also multiplied by 10.

1 Calculate the following multiplication problems.

1 20 × 4 = 80　　2 30 × 3 = 90
3 40 × 6 = 240　　4 50 × 7 = 350
5 90 × 8 = 720　　6 80 × 5 = 400

Example 2 Calculate the following multiplication problems.

200 × 3 = 600

2 × 3 = 6
↓ 100 times　↓ 100 times
200 × 3 = 600

When the multiplicand is multiplied by 100, the answer is also multiplied by 100.

2 Calculate the following multiplication problems.

1 300 × 3 = 900　　2 500 × 5 = 2500
3 400 × 6 = 2400　　4 800 × 9 = 7200
5 700 × 7 = 4900　　6 600 × 5 = 3000

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1 - 8 Properties of Multiplication — Review

1 Write the numbers in the ☐.

1. The answer to 8 × 6 is [8] larger than 8 × 5.
2. The answer to 9 × 4 is [9] larger than 9 × 3.
3. The answer to 6 × 3 is [6] larger than 6 × 2.
4. The answer to 7 × 5 is [7] smaller than 7 × 6.
5. The answer to 3 × 8 is [3] smaller than 3 × 9.
6. The answer to 4 × 6 is [4] smaller than 4 × 7.

2 Write the numbers in the ☐.

1. 5 × 6 = 5 × 5 + [5]
2. 8 × 4 = 8 × 3 + [8]
3. 7 × 4 = 7 × 3 + [7]
4. 3 × 5 = 3 × 6 − [3]
5. 6 × 8 = 6 × 9 − [6]
6. 2 × 6 = 2 × 7 − [2]

3 Write the numbers in the ☐.

1. 7 × 5
   - 5 × 5 = [25]
   - [2] × 5 = [10]
   - Altogether [35]
2. 6 × 6
   - 5 × 6 = [30]
   - [1] × 6 = [6]
   - Altogether [36]
3. 9 × 6
   - 4 × 6 = [24]
   - [5] × 6 = [30]
   - Altogether [54]
4. 10 × 7
   - 6 × 7 = [42]
   - [4] × 7 = [28]
   - Altogether [70]
5. 12 × 3
   - 7 × 3 = [21]
   - [5] × 3 = [15]
   - Altogether [36]
6. 15 × 4
   - 9 × 4 = [36]
   - [6] × 4 = [24]
   - Altogether [60]

4 Write the numbers in the ☐.

1. 6 × [8] = 48
2. 3 × [7] = 21
3. 4 × [4] = 16
4. [8] × 5 = 40
5. [4] × 8 = 32
6. [5] × 2 = 10

5 Calculate the following multiplication problems.

1. 20 × 8 = [160]
2. 50 × 7 = [350]
3. 90 × 6 = [540]
4. 400 × 8 = [3200]
5. 300 × 7 = [2100]
6. 600 × 3 = [1800]
7. 0 × 5 = [0]
8. 8 × 0 = [0]

10 11

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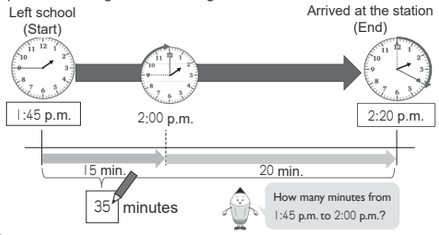
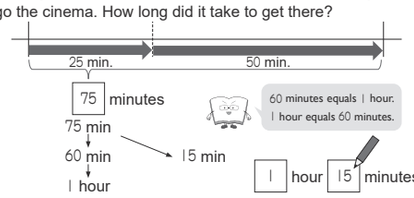
2 - 1 Time Points and Time Intervals — How to Find Time Points (1)

Example 1

1. A girl left school at 1:45 p.m. and arrived at the station at 2:20 p.m.. How long did it take to get there?

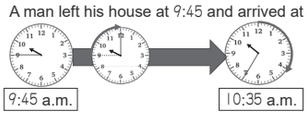


2. A boy walked 25 minutes and traveled 50 minutes by bus to go the cinema. How long did it take to get there?



1 How long did it take to get there in the following situations?

1. A man left his house at 9:45 and arrived at a café at 10:35.



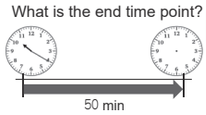
[50] minutes

2. A woman walked 35 minutes and traveled 55 minutes by bus to go to a hospital.

[90] minutes = [1] hour [30] minutes

Example 2

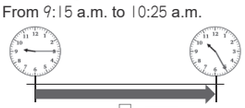
1. What is the end time point?



How many minutes to 11:00 a.m.? It is easy to think based on the hour.

11:10 a.m.

2. How long is the time interval? From 9:15 a.m. to 10:25 a.m.

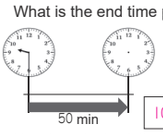


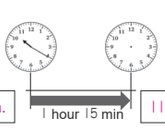
As you learnt in grade 2, a time interval means working out how long something takes.

☐

[70] minutes = [1] hour [10] minutes

2 What is the end time point?

1. 

10:20 a.m.
2. 

11:35 a.m.

3 How long is the following time intervals?

1. From 11:45 a.m. to 12:50 p.m.

[65] minutes = [1] hour [5] minutes

2. From 1:10 p.m. to 4:20 p.m.

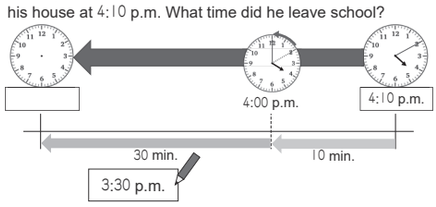
[3] hour [10] minutes

12 13

2 - 2 Time Points and Time Intervals
How to Find Time Points (2)

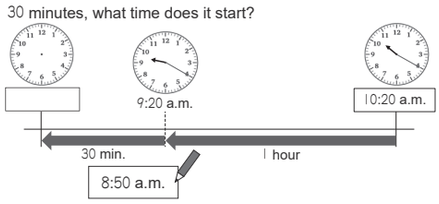
Example

1 A boy left school and walked for 40 minutes. He arrived at his house at 4:10 p.m. What time did he leave school?



3:30 p.m.

2 A music class finishes at 10:20 a.m. If the class lasts 1 hour 30 minutes, what time does it start?



8:50 a.m.

1 It takes 20 minutes to get from a girl's house to the post office. To arrive at the post office at 2:05 p.m., what time should she leave her house?

1:45 p.m.

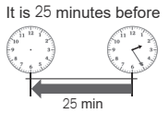
2 If you visit a park and stay there for 45 minutes until 10:20 a.m., what time should you arrive there?

9:35 a.m.

Example 2

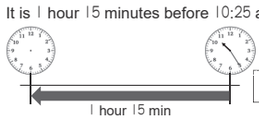
Find the following time points.

1 It is 25 minutes before 2:25 p.m.



2:00 p.m.

2 It is 1 hour 15 minutes before 10:25 a.m.



9:10 a.m.

2 Find the following time points.

1 It is 40 minutes before 8:50 a.m.

8:10 a.m.

2 It is 25 minutes before 4:10 p.m.

3:45 p.m.

3 It is 3 hours before 4:25 p.m.

1:25 p.m.

4 It is 2 hours before 1:45 p.m.

11:45 a.m.

5 It is 1 hour 50 minutes before 2:45 p.m.

12:55 p.m.

2 - 3 Time Points and Time Intervals
Shorter Time

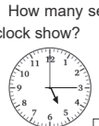
Instruction Shorter time than 1 minute.

- There is a unit of time shorter than a minute. It is called a **second**.
- The third hand shows seconds and goes around just like the other hands.

1 minute = 60 seconds

Example

1 How many seconds does the clock show?



15 seconds.

2 How many minutes and seconds is 85 seconds?

85 sec → 60 sec → 1 min, 25 sec

1 minute 25 seconds.

3 How many seconds is 1 minute?

1 minute × 60 seconds = 60 seconds.

Close your eyes and count 10 seconds in your head. Experience how long 10 seconds is.

1 How many seconds do the following clocks show?

1  45 seconds.

2  20 seconds.

3  2 seconds.

2 How many seconds and minutes are the following units of time?

1 100 seconds

1 minute 40 seconds.

2 2 minutes

120 seconds.

3 How long does it take to clap 10 times?

2 - 4 Time Points and Time Intervals
Making Time Problems

Example Choose the story that indicates the following picture.

A A Mathematics class starts at 8:40 a.m. and finishes at 9:20 a.m.

B A bus started at 9:40 a.m. and arrived at the last stop after 40 minutes.

Answer B

Choose the story that indicates the following picture.

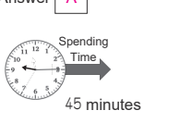
1

A I left my house at 11:35 p.m. and arrived at school after 35 minutes.

B It's 11:35 a.m. Lunchtime starts at 12:10 p.m. I have to wait for 25 minutes more.

Answer A

2

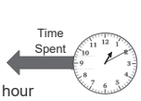


A I miss a bus, and the next bus will come at 10:00 a.m.

B It's 9:15 a.m. I have to go at 9:45 a.m. to pick up my mother.

Answer A

3



A A girl attended a science class at 12:40 p.m.

B A boy started his house at 11:40 a.m.

Answer B

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2 - 5 Time Points and Time Intervals — Review

1 Find the following time points.

1. It is 30 minutes after 7:30 a.m. — 8:00 a.m.
2. It is 45 minutes before 2:15 p.m. — 1:30 p.m.
3. It is 1 hour 15 minutes before 1:05 p.m. — 11:50 a.m.

2 Fill in the ☐ with the appropriate numbers.

1. 60 seconds = 1 minute
2. 3 minutes = 180 seconds
3. 150 seconds = 2 minute 30 seconds
4. 280 seconds = 4 minute 40 seconds

3 Fill in the ☐ with the appropriate unit for time.

1. The amount of time you sleep in one day. — Hour
2. The time it takes you to take a single breath. — Second
3. The length of a TV news show. — Minute

5 Choose the story that indicates the following picture.

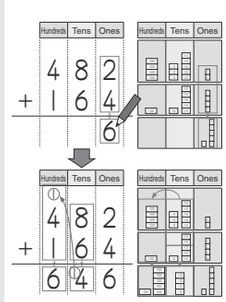
Answer B

A: A library opens at 9:00 a.m. I should leave my house at 8:45 a.m.

B: A language class started at 8:15 a.m. It was 45 minutes ago.

3 - 1 Addition and Subtraction — Addition (1)

Example Calculate 482 + 164 by using the algorithm.



Line up the numbers vertically in each place.

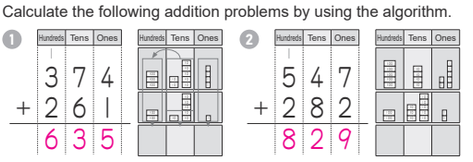
Calculation of the ones place
2 + 4 = 6
Write a 6 in the ones place.

Calculation of the tens place
8 + 6 = 14
Regroup 1 to the hundreds place.

Calculation of the hundreds place
The regrouped 1 and 4 make 5.
5 + 1 = 6
Write a 6 in the hundreds place.

482 + 164 = 646

Calculate the following addition problems by using the algorithm.



1. 635
2. 829
3. 294 + 354
4. 422 + 194
5. 462 + 275
6. 563 + 162
7. 785 + 132
8. 672 + 234
9. 567 + 352
10. 121 + 582

3	648	4	616	5	737	6	725
7	917	8	906	9	919	10	703

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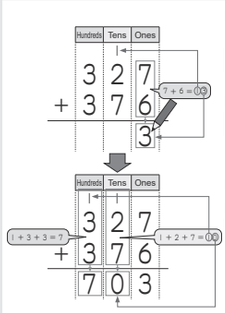
3 - 2 Addition and Subtraction — Addition (2)

Example Calculate 327 + 376 by using the algorithm.



Line up the numbers vertically in each place.

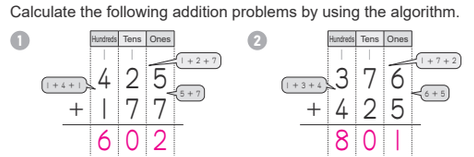
Calculation of the ones place
7 + 6 = 13
Regroup 1 in the tens place.

Calculation of the tens place
The regrouped 1 and 2 make 3.
3 + 7 = 10
Regroup 1 to the hundreds place.

Calculation of the hundreds place
The regrouped 1 and 3 make 4.
4 + 3 = 7

327 + 376 = 703

Calculate the following addition problems by using the algorithm.

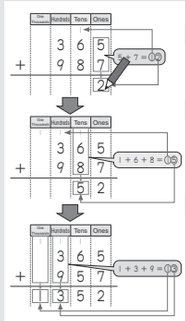


1. 602
2. 801
3. 637 + 269
4. 584 + 238
5. 197 + 378
6. 463 + 238
7. 328 + 495
8. 719 + 185
9. 449 + 153
10. 635 + 197

3	906	4	822	5	575	6	701
7	823	8	904	9	602	10	832

3 - 3 Addition and Subtraction — Addition (3)

Example Calculate 365 + 987 by using the algorithm.



Line up the numbers vertically in each place.

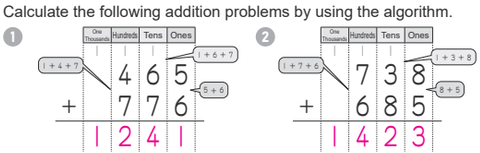
Calculation of the ones place
5 + 7 = 12
Regroup 1 in the tens place.
Write a 2 in the ones place.

Calculation of the tens place
The regrouped 1 and 6 make 7.
7 + 8 = 15
Regroup 1 to the hundreds place.
Write a 5 in the tens place.

Calculation of the hundreds place
The regrouped 1 and 3 make 4.
4 + 9 = 13
Regroup 1 to the one thousands place.
Write a 3 in the hundreds place.
Write a 1 in the one thousands place.

365 + 957 = 1352

Calculate the following addition problems by using the algorithm.



1. 1241
2. 1423
3. 237 + 974
4. 693 + 869
5. 324 + 796
6. 567 + 765
7. 842 + 268
8. 789 + 345
9. 456 + 567
10. 678 + 789

3	1211	4	1562	5	1120	6	1332
7	1110	8	1134	9	1023	10	1467

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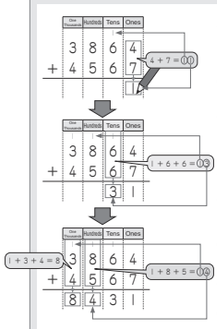
3 - 4 Addition and Subtraction
Addition (4)

Example Calculate 3864 + 4567 by using the algorithm.



Line up the numbers vertically in each place.

Calculation of the ones place

4 + 7 = 11

Regroup 1 in the tens place.
Write a 1 in the ones place.

Calculation of the tens place

The regrouped 1 and 6 make 7.

7 + 6 = 13

Regroup 1 to the hundreds place.
Write a 3 in the tens place.

Calculation of the hundreds place

The regrouped 1 and 8 make 9.

9 + 5 = 14

Regroup 1 to the one thousands place.
Write a 4 in the hundreds place.

Calculation of the one thousands place

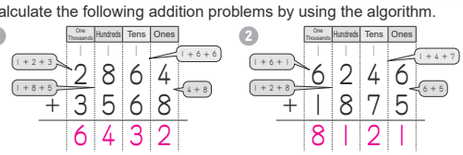
The regrouped 1 and 3 make 4.

4 + 4 = 8

Write a 8 in the one thousands place.

3864 + 4567 = 8431

Calculate the following addition problems by using the algorithm.

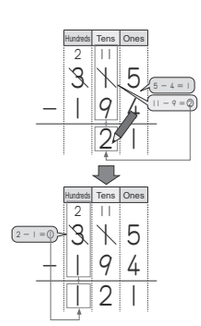


3 2575 + 1698 4 1483 + 3737 5 5368 + 1936
6 4567 + 2684 7 7531 + 1789 8 3642 + 2578

3	4273	4	5220	5	7304
6	7251	7	9320	8	6220

3 - 5 Addition and Subtraction
Subtraction (1)

Example Calculate 315 − 194 by using the algorithm.



Line up the numbers vertically in each place.

Calculation of the ones place

5 − 4 = 1

Calculation of the tens place

You cannot take 9 from 1, so you need to regroup from the hundreds place.

11 − 9 = 2

Write a 2 in the tens place.

Calculation of the hundreds place

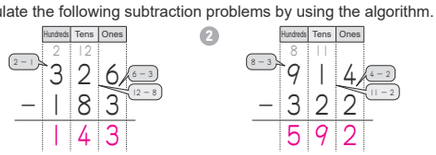
Since you regrouped, it became 2.

2 − 1 = 1

Write an 1 in the hundreds place.

315 − 194 = 121

Calculate the following subtraction problems by using the algorithm.



3 628 − 273 4 765 − 471 5 727 − 196 6 825 − 263
7 537 − 376 8 468 − 281 9 813 − 642 10 567 − 186

3	355	4	294	5	531	6	562
7	161	8	187	9	171	10	381

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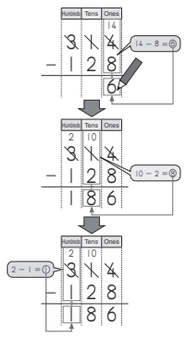
3 - 6 Addition and Subtraction
Subtraction (2)

Example Calculate 314 − 128 by using the algorithm.



Line up the numbers vertically in each place.

Calculation of the ones place

Regroup from the tens place.

14 − 8 = 6

Write a 6 in the ones place.

Calculation of the tens place

Since you regrouped, it became 0.
Regroup from the hundreds place.

10 − 2 = 8

Write a 8 in the hundreds place.

Calculation of the hundreds place

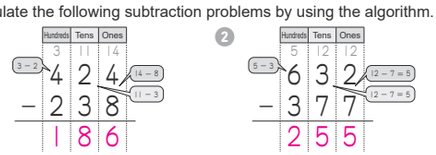
Since you regrouped, it became 2.

2 − 1 = 1

Write a 1 in the hundreds place.

314 − 128 = 186

Calculate the following subtraction problems by using the algorithm.

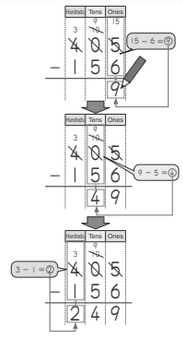


3 758 − 179 4 814 − 475 5 935 − 289 6 632 − 385
7 321 − 123 8 543 − 345 9 765 − 567 10 987 − 789

3	579	4	339	5	646	6	247
7	198	8	198	9	198	10	198

3 - 7 Addition and Subtraction
Subtraction (3)

Example Calculate 405 − 156 by using the algorithm.



Line up the numbers vertically in each place.

Calculation of the ones place

Since you cannot regroup from the tens place, you can regroup from the hundreds place.
Regroup 10 tens in the tens place.
Then regroup 10 ones in the ones place.

15 − 6 = 9

Calculation of the tens place

Since you regrouped, it became 9.

9 − 5 = 4

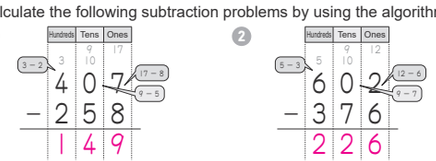
Calculation of the hundreds place

Since you regrouped, it became 3.

3 − 1 = 2

405 − 156 = 249

Calculate the following subtraction problems by using the algorithm.



3 603 − 306 4 704 − 407 5 805 − 508 6 906 − 609
7 907 − 709 8 806 − 608 9 705 − 507 10 604 − 406

3	297	4	297	5	297	6	297
7	198	8	198	9	198	10	198

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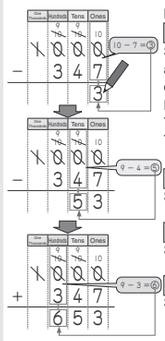
3 - 8 Addition and Subtraction — Subtraction (4)

Example Calculate 1000 − 347 by using the algorithm.



Line up the numbers vertically in each place.

Calculation of the ones place
Since you cannot regroup from the tens place and hundreds place, you can regroup from the one thousands place.
Regroup 10 hundreds in the hundreds place.
Then regroup 10 tens in the tens place.
Then regroup 10 ones in the ones place.
10 − 7 = 3

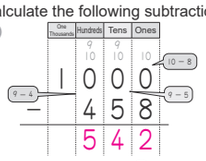
Calculation of the tens place
Since you regrouped, it became 9.
9 − 4 = 5

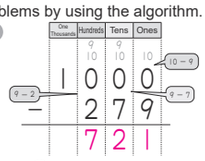
Calculation of the hundreds place
Since you regrouped, it became 9.
9 − 3 = 6

Calculation of the one thousands place
Since you regrouped, it became 0.

1000 − 347 = 653

Calculate the following subtraction problems by using the algorithm.



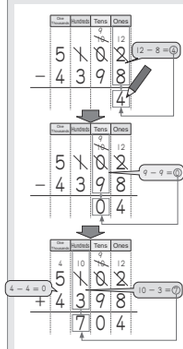


3 1000 − 515 4 1000 − 716 5 1000 − 687
6 1000 − 387 7 1000 − 195 8 1000 − 934

3	485	4	284	5	313
6	613	7	805	8	66

3 - 9 Addition and Subtraction — Subtraction (5)

Example Calculate 5102 − 4398 by using the algorithm.



Line up the numbers vertically in each place.

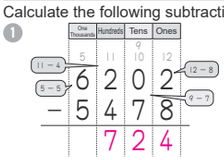
Calculation of the ones place
Since you cannot regroup from the tens place, you can regroup from the hundreds place.
Regroup 10 tens in the tens place.
Then regroup 10 ones in the ones place.
12 − 8 = 4

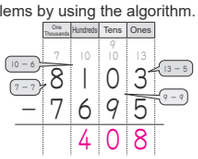
Calculation of the tens place
Since you regrouped, it became 9.
9 − 9 = 0
Write a 0 in the tens place.

Calculation of the hundreds place
Since you regrouped, it became 0. Therefore, you need to regroup from the one thousands place.
10 − 3 = 7

Calculation of the one thousands place
Since you regrouped, it became 4.
4 − 4 = 0
Because it is 0, you do not need to write a 0.
5102 − 4398 = 704

Calculate the following subtraction problems by using the algorithm.





3 3406 − 2747 4 5105 − 4736 5 4201 − 3697
6 7205 − 6897 7 9204 − 8375 8 2503 − 1578

3	659	4	369	5	504
6	308	7	829	8	925

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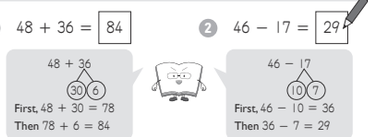
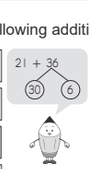
3 - 10 Addition and Subtraction — Mental Arithmetic (1)

Example Calculate the following in your head.

1 48 + 36 = 84 2 46 − 17 = 29

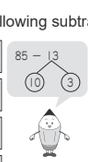


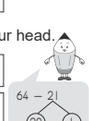
1 Calculate the following addition problems in your head.



1 21 + 36 = 57 2 15 + 53 = 68
3 44 + 35 = 79 4 31 + 46 = 77
5 53 + 36 = 89 6 14 + 38 = 52
7 47 + 38 = 85 8 27 + 67 = 94
9 29 + 18 = 47 10 47 + 24 = 71

2 Calculate the following subtraction problems in your head.



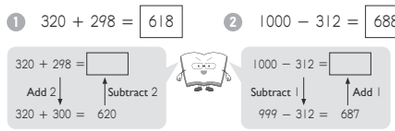


1 85 − 13 = 72 2 64 − 21 = 43
3 56 − 45 = 11 4 38 − 15 = 23
5 38 − 17 = 21 6 73 − 35 = 38
7 41 − 28 = 13 8 90 − 65 = 25
9 82 − 49 = 33 10 94 − 47 = 47

3 - 11 Addition and Subtraction — Mental Arithmetic (2)

Example Calculate the following in your head.

1 320 + 298 = 618 2 1000 − 312 = 688



1 Calculate the following addition problems in your head.

1 220 + 298 = 518 2 350 + 398 = 748
3 240 + 498 = 738 4 510 + 199 = 709
5 330 + 299 = 629 6 340 + 399 = 739
7 710 + 197 = 907 8 140 + 297 = 437
9 560 + 397 = 957 10 130 + 496 = 626

2 Calculate the following subtraction problems in your head.

1 1000 − 322 = 678 2 1000 − 354 = 646
3 1000 − 682 = 318 4 1000 − 528 = 472
5 1000 − 456 = 544 6 1000 − 672 = 328
7 1000 − 582 = 418 8 1000 − 264 = 736
9 1000 − 878 = 122 10 1000 − 798 = 202

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3 - 12 Addition and Subtraction
Addition of Three Numbers

Example 1 Calculate the following in your head.

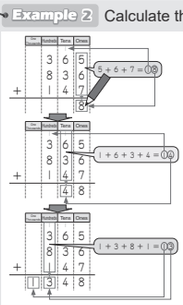
386 + 67 + 33 = 486

It is fine that the addition is calculated in a different order.
First 67 + 33 = 100
Then 386 + 100 = 486

1 Calculate the following addition problems in your head.

1. 475 + 67 + 33 = 575
2. 573 + 81 + 19 = 673
3. 296 + 72 + 28 = 396
4. 358 + 43 + 57 = 458

Example 2 Calculate the following by using the algorithm.



Line up the numbers vertically in each place.
Calculation of the ones place
5 + 6 + 7 = 18
Regroup 1 to the tens place.
Calculation of the tens place
The regrouped 1 and 6 make 7.
7 + 3 + 4 = 14
Regroup 1 to the hundreds place.
Calculation of the hundreds place
The regrouped 1 and 3 make 4.
4 + 8 + 1 = 13
Regroup 1 to the one thousands place.
Calculation of the one thousands place
Write the regrouped 1.
365 + 836 + 147 = 1348

2 Calculate the following addition problems by using the algorithm.

1. 267 + 443 + 674 = 1384
2. 572 + 761 + 459 = 1792
3. 325 + 466 + 513 = 1304
4. 428 + 387 + 254 = 1069

3 - 13 Addition and Subtraction
Review

1 Calculate the following addition problems by using the algorithm.

1. 625 + 293 = 918
2. 567 + 336 = 903
3. 768 + 456 = 1224
4. 389 + 926 = 1315
5. 4865 + 2376 = 7241
6. 1849 + 3572 = 5421

2 Calculate the following subtraction problems by using the algorithm.

1. 654 − 456 = 198
2. 987 − 789 = 198
3. 600 − 385 = 215
4. 1000 − 456 = 544
5. 1000 − 298 = 702
6. 3505 − 2858 = 647

3 Calculate the following problems in your head.

1. 45 + 23 = 68
2. 56 + 38 = 94
3. 250 + 499 = 749
4. 74 − 33 = 41
5. 84 − 49 = 35
6. 1000 − 257 = 743

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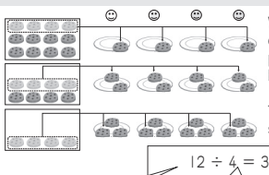
4 - 1 Division
How Many for Each Person ?

Example 1 There are 12 biscuits. If they are divided evenly among 4 people, how many biscuits will 1 person get? Make a math sentence.



When 12 biscuits are divided evenly among 4 people, 1 person gets 3 biscuits.

This is written as the math sentence below:

12 ÷ 4 = 3

Total number of objects | Number of people | Number of objects for 1 person

(Twelve divided by four equals three)

1 Write the **division** symbol.

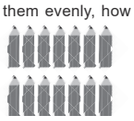
2 Read the following questions and write the math sentences.

1. There are 12 pieces of candy. If 3 children share them equally, how many pieces of candy will each child get?

Math sentence: 12 ÷ 3

2. There are 14 pencils. If 2 children divide them evenly, how many pencils will each child get?

Math sentence: 14 ÷ 2

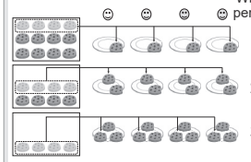


Example 2 Find the answer for the following division problem.

12 ÷ 4 = 3

Number of objects for 1 person | Total number of objects | Number of people

When each person gets,



1 biscuit: 1 × 4 = 4
2 biscuit: 2 × 4 = 8
3 biscuit: 3 × 4 = 12

The answer to 12 ÷ 4 is the number that goes in the □.
□ × 4 = 12
You can use the multiplication facts of 4.

3 Read the following questions and write the math sentences. Then find the answers.

1. There are 24 pieces of candy. If 6 children share them equally, how many pieces of candy will each child get?

Math sentence: 24 ÷ 6 = 4 Answer: 4 pieces of candy

2. There are 32 pencils. If 4 children divide them evenly, how many pencils will each child get?

Math sentence: 32 ÷ 4 = 8 Answer: 8 pencils

3. There are 15 oranges. If 5 children share them equally, how many oranges will each child get?

Math sentence: 15 ÷ 5 = 3 Answer: 3 oranges

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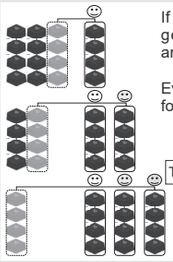
4 - 2 Division — How Many People ?

Example There are 12 chocolates. If we give 4 chocolates to each child, how many children can share the chocolates? Make a math sentence and find the answer.



If 12 chocolates are divided so each child gets 4, the chocolates can be shared among 3 children.

Even in this case, it can be written with the following division math sentence.

12 ÷ 4 = 3

Total number of objects | Number of people | Number of objects for 1 person

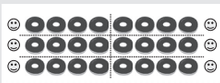
Answer 3 children

Read the following questions and write the math sentences. Then find the answer.

1. There are 20 flowers. If we give 4 flowers to each person, how many people can share the flowers?
   Math sentence 20 ÷ 4 = 5 Answer 5 people
2. There are 36 balls. If we put 9 balls in each basket, how many baskets do we need?
   Math sentence 36 ÷ 9 = 4 Answer 4 baskets
3. There is a ribbon that is 24 cm long. We want to cut an 8 cm long pieces of ribbon. How many pieces of ribbon can we cut?
   Math sentence 24 ÷ 8 = 3 Answer 3 pieces

4 - 3 Division — Making Division Problems

Example Look at the following picture, math sentence and answer. Then choose the most appropriate problem sentence.



Math sentence 24 ÷ 6 = 4

Answer 4 donuts

(a) There are 24 donuts. If we give 4 donuts to each child, how many children can share the donuts?
(b) There are 24 donuts. If 6 children share the donuts equally, how many donuts will each child get?
(c) There are 6 children. If each child has 4 donuts, how many donuts are there altogether?

Look at the following picture, math sentence and answer. Then choose the most appropriate problem sentence.

1. 

   Math sentence 12 ÷ 3 = 4
   Answer 4 bananas

   (a) There are 12 bananas. If 3 people share them equally, how many bananas can each person get?
   (b) There are 12 bananas. If we give 4 bananas to each person, how many people can get the bananas?
   (c) There are 3 people. If each person has 4 bananas, how many bananas are there altogether?

2. 

   Math sentence 18 ÷ 3 = 6
   Answer 6 people

   (a) There are 6 packages, each of which has 3 cans of juice. How many cans of juice are there altogether?
   (b) There are 18 cans of juice. If 6 people share them equally, how many cans of juice each person can get?
   (c) There are 18 cans of juice. If we give 3 cans to each person, how many people can receive them?

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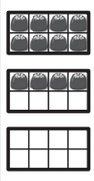
4 - 4 Division — Divide 0 and Divide by 1

Example 1 Some chocolates in a box will be shared equally among 4 children. How many chocolates does each child get in the following situations?



1. When there are 8 chocolates
   8 ÷ 4 = 2 Answer 2 chocolates
2. When there are 4 chocolates
   4 ÷ 4 = 1 Answer 1 chocolate
3. When there is no chocolate in the box
   0 ÷ 4 = 0 Answer 0 chocolate

1 Calculate the following division problems.

1. 0 ÷ 2 = 0
2. 0 ÷ 4 = 0
3. 0 ÷ 8 = 0
4. 0 ÷ 5 = 0
5. 0 ÷ 3 = 0
6. 0 ÷ 7 = 0

Example 2 There are 8 chocolates. If there is only 1 person here, how many chocolates does this person get?

8 ÷ 1 = 8 Answer 8 chocolates

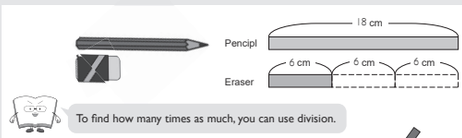
The answer to 8 ÷ 1 is the number that goes in the □. □ × 1 = 8

2 Calculate the following division problems.

1. 7 ÷ 1 = 7
2. 9 ÷ 1 = 9
3. 3 ÷ 1 = 3
4. 5 ÷ 1 = 5
5. 4 ÷ 1 = 4
6. 6 ÷ 1 = 6

4 - 5 Division — Calculations for Finding Times as Much

Example The length of a pencil is 18 cm. The length of an eraser is 6 cm. How many times as long is the pencil than the eraser?



To find how many times as much, you can use division.

Math sentence 18 ÷ 6 = 3 Answer 3 times

Answer the following questions.

1. There is a red ribbon and a blue ribbon. The length of the red ribbon is 36 cm. The length of the blue ribbon is 9 cm. How many times as long is the red ribbon as the blue ribbon?
   Math sentence 36 ÷ 9 = 4 Answer 4 times
2. There are 21 cans of orange juice and 7 cans of grape juice. How many times as many cans of orange juice are there as cans of grape juice?
   Math sentence 21 ÷ 7 = 3 Answer 3 times
3. There are 42 pieces of coloured paper and 6 pieces of white paper. How many times as many coloured paper are there as white paper?
   Math sentence 42 ÷ 6 = 7 Answer 7 times

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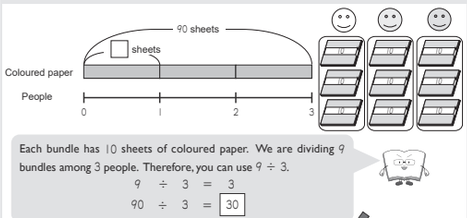
4 - 6 Division — Divide a Large Number (1)

Example 90 sheets of coloured paper are divided evenly among 3 people. How many sheets of coloured paper will each person get?



Each bundle has 10 sheets of coloured paper. We are dividing 9 bundles among 3 people. Therefore, you can use 9 ÷ 3.

9 ÷ 3 = 3

90 ÷ 3 = 30

Math sentence: 90 ÷ 3 = 30 Answer: 30 sheets of coloured paper

Answer the following questions.

1. 60 sheets of paper are divided evenly among 3 people. How many sheets of paper will each person get?

   Math sentence: 60 ÷ 3 = 20 Answer: 20 sheets of paper

2. 50 cupcakes are divided evenly among 5 children. How many cupcakes will each child get?

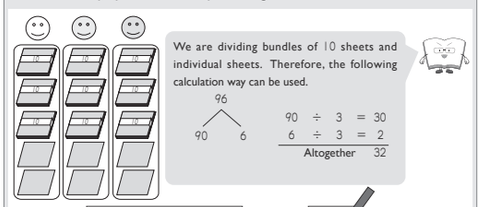
   Math sentence: 50 ÷ 5 = 10 Answer: 10 cupcakes

3. 60 pencils are divided evenly among 2 students. How many pencils will each student get?

   Math sentence: 60 ÷ 2 = 30 Answer: 30 pencils

4 - 7 Division — Divide a Large Number (2)

Example 96 sheets of coloured paper are divided evenly among 3 people. How many sheets of coloured paper will each person get?



We are dividing bundles of 10 sheets and individual sheets. Therefore, the following calculation way can be used.

96 → 90, 6

90 ÷ 3 = 30

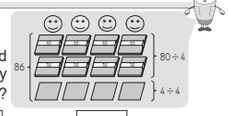
6 ÷ 3 = 2

Altogether 32

Math sentence: 96 ÷ 3 = 32 Answer: 32 sheets of coloured paper

Answer the following questions.

1. 84 sheets of paper are divided evenly among 4 people. How many sheets of paper will each person get?



   Math sentence: 84 ÷ 4 = 21 Answer: 21 sheets of paper

2. 36 chocolates are divided evenly among 3 children. How many chocolates will each child get?

   Math sentence: 36 ÷ 3 = 12 Answer: 12 chocolates

3. 68 coloured pencils are divided evenly among 2 students. How many coloured pencils will each student get?

   Math sentence: 68 ÷ 2 = 34 Answer: 34 coloured pencils

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4 - 8 Division — Review

1 Calculate the following division problems.

1 12 ÷ 3 = 4	2 15 ÷ 5 = 3	3 24 ÷ 4 = 6
4 32 ÷ 8 = 4	5 49 ÷ 7 = 7	6 45 ÷ 5 = 9
7 14 ÷ 2 = 7	8 45 ÷ 9 = 5	9 0 ÷ 4 = 0
10 7 ÷ 1 = 7	11 80 ÷ 2 = 40	12 63 ÷ 3 = 21

2 Answer the following questions.

1. There are 48 pieces of candy. If 8 children share them equally, how many pieces of candy will each child get?

   Math sentence: 48 ÷ 8 = 6 Answer: 6 pieces of candy

2. There are 36 flowers. If we put 4 flowers in each vase, how many vases do we need?

   Math sentence: 36 ÷ 4 = 9 Answer: 9 vases

3. There are 24 black pens and 6 red pens. How many times as many black pens are there than red pens?

   Math sentence: 24 ÷ 6 = 4 Answer: 4 times

3 Look at the following picture, math sentence and answer. Then choose the most appropriate problem sentence.

(a) There are 15 cupcakes. If we give 3 cupcakes to each child, how many children can share the cupcakes?

(b) There are 15 cupcakes. If 5 children share the cupcakes equally, how many cupcakes will each child get?

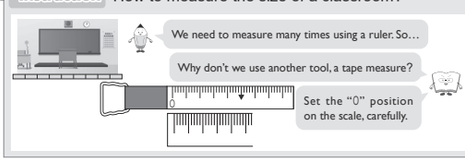
(c) There are 5 children. If each child has 3 cupcakes, how many cupcakes are there altogether?

Math sentence: 15 ÷ 5 = 3

Answer: 3 cupcakes

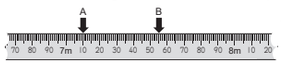
5 - 1 Length — Tape Measure

Instruction How to measure the size of a classroom?



Example

1. Read the lengths of the ⬇ on the tape measures below.



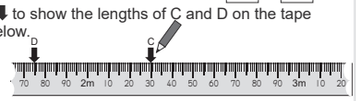
A is 7 m 10 cm.

B is 7 m 55 cm.

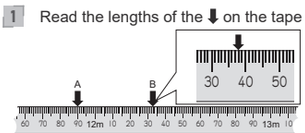
2. Draw an ⬇ to show the lengths of C and D on the tape measure below.

C : 2 m 30 cm

D : 1 m 75 cm



1 Read the lengths of the ⬇ on the tape measures below.



A is 11 m 90 cm.

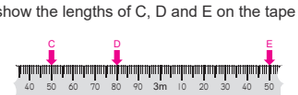
B is 12 m 38 cm.

2 Draw an ⬇ to show the lengths of C, D and E on the tape measure below.

C : 2 m 50 cm

D : 2 m 80 cm

E : 3 m 50 cm



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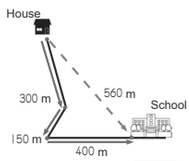
5 - 2 Length — Direct Distance and Travel Distance

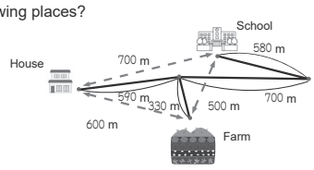
Example What is the length in metres of a straight line from a boy's house to the school? What is the length in metres of the side streets from the house to the hospital?



The length of a straight line between two places is called "**direct distance**." And the length along streets between two places is called "**travel distance**."

Direct distance is 560 m Travel distance is 850 m

What is the direct distance and the travel distance between the following places?



1. Between the house and the farm.
   Direct distance is 600 m. Travel distance is 920 m.
2. Between the farm and the school.
   Direct distance is 500 m. Travel distance is 1610 m.
3. Between the house and the school.
   Direct distance is 700 m. Travel distance is 1870 m.

5 - 3 Length — Units of Long Length

Example 1 Convert the lengths.

1050 m = 1 km 50 m.

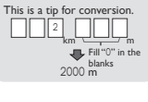
1000 m is the same as 1 kilometer and it can be written.

Example 2 Convert the lengths to m / km and m.

1. 2 km = 2000 m
2. 1 km 400 m = 1400 m

1 km = 1000 m
1 m = 100 cm
1 cm = 10 mm

This is a tip for conversion.



Convert the lengths to m, km / km and m. □□□ km □□□ m

1. 1000 m = 1 km
2. 5000 m = 5 km
3. 1200 m = 1 km 200 m
4. 2650 m = 2 km 650 m
5. 3776 m = 3 km 776 m
6. 8848 m = 8 km 848 m
7. 3 km 900 m = 3900 m
8. 5 km 350 m = 5350 m
9. 7 km 40 m = 7040 m
10. 4 km 24 m = 4024 m
11. 6 km 5 m = 6005 m
12. 1 km 2 m = 1002 m
13. 9 km 175 m = 9175 m
14. 10 km = 10000 m

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5 - 4 Length — Various Units of Length

Example Fill in the □ with the appropriate unit of length.

1. The length of a pencil. 15 cm
2. The thickness of a notebook. 3 mm
3. The distance walked in an hour. 4 km

Fill in the □ with the appropriate unit of length.

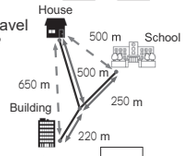
1. The width of a notebook. 21 cm
2. The length of a classroom. 8 m
3. The length between ruled lines in a notebook. 7 mm
4. The length of a step. 60 cm
5. The distance walking in an hour. 5 km
6. The length of a pen. 12 cm
7. The width of a staple. 8 mm

5 - 5 Length — Review

1. Read the lengths of the ⬇ on the tape measure below.

A is 4 m 90 cm.
B is 5 m 95 cm.

2. What is the direct distance and the travel distance between the following places?



1. Between the house and the building.
   Direct distance is 650 m Travel distance is 720 m
2. Between the house and the school.
   Direct distance is 500 m Travel distance is 750 m

3. Convert the lengths to m, km / km and m. □□□ km □□□ m

1. 1 km = 1000 m
2. 3000 m = 3 km
3. 1 km 500m = 1500 m
4. 5895 m = 5 km 895 m

4. Fill in the □ with the appropriate unit of length.

1. The travelling distance of a hiking trail. 15 km
2. The thickness of a coin. 1 mm

6 - 1 Tables and Bar Graphs
Data Organization

Example 1 The table below summarizes the results of a class survey to find the best three favorite sweets which teacher will give it as a prize. Find the number of people who voted by using tally marks.

Chocolate	Chocolate	Candy	Chocolate
Gum	Candy	Gum	Gum
Candy	Chocolate	Candy	Ice cream
Gum	Chocolate	Biscuits	Candy
Chocolate	Gum	Chocolate	Pudding

Chocolate	𝍸 //
Candy	𝍸
Gum	𝍸
Biscuits	/
Ice cream	/
Pudding	/

This is a way of tally
1 people /
2 people //
3 people ///
4 people ////
5 people 𝍸

1 The table below summarizes the results of a class survey to find the best three favorite colours to buy color paper for an art class. Find the number of people who were surveyed by using tally marks.

Orange	Orange	Blue	Blue	Brown
Blue	Orange	Red	Orange	Red
Red	Green	Blue	Red	
Blue	Blue	Orange	Red	
Blue	Orange	Purple	Orange	

Red	𝍸
Blue	𝍸 //
Orange	𝍸 //
Green	/
Purple	/
Brown	/

Example 2 Convert the tally in Example 1 into numerals and sort out the numbers in the table below.

Favorite sweets	Chocolate	Candy	Gum	Other
Number of people	7	5	5	3

Sort out in descending order (from many to few) from the left to see what the best is.

Small numbers of votes comparing to the best three items are summed up as "Other". Put "Other" last.

How many votes were there collected in total? 20

2 Convert the tally in Problem 1 into numerals and sort out the numbers in the table below. Small numbers of votes comparing to the best three items are summed up as "Other" and put "Other" last.

Favorite colors	Blue	Orange	Red	Other	Total
Number of people	7	7	5	3	22

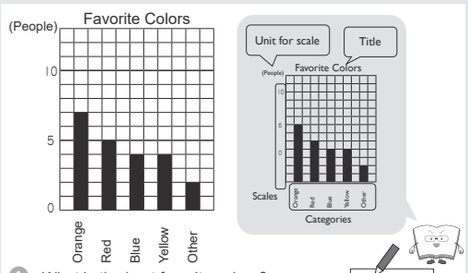
3 The tally shows the result of a class survey on the best three favorite drinks into numerals. Sort out the numbers in the table below. Small numbers of votes comparing to the best three items are summed up as "Other" and put "Other" last.

Water	𝍸 /
Juice	𝍸 ///
Tea	//
Soda	𝍸 𝍸
Coffee	//
Milk	//

Favorite drinks	Soda	Juice	Water	Other	Total
Number of people	10	8	6	6	30

6 - 2 Tables and Bar Graphs
Bar Graphs (1)

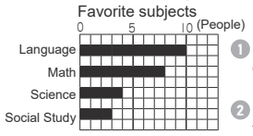
Example 1 A boy created the graph by surveying his classmates about the best favorite colors.



1 What is the best favorite colour? Orange

2 What is the difference between the number of classmates who like the best favorite colour and the second best favorite colour? 2 people

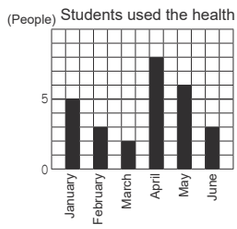
1 A teacher created the graph by surveying her classmates about their favorite subjects to think of organizing extra classes.



1 How many people like math class? 8 people

2 What is the difference between the number of language and social study like? 7 people

Example 2 A boy created the bar graph by tallying the number of students used the health room during 6 months. The result helped to call attention to students.



When the order of the category is fixed such as the months of the year, they are not ordered from largest to smallest.

1 Which month had the most students used? April

2 Which month had the least students used? March

3 Which of the month that the number of users has increased compared in the adjacent months? April

Why many students used health room in April?

Maybe new semester begins in the month.

2 A girl created the bar graph by tallying the number of books her classmates borrowed from the school library over four months to decide when she will reorganize books in the library.

1 In which month were the most books borrowed? July

2 How many books were borrowed during that month? 9 Books

3 What is the difference the number of books borrowed in July and August? 6 books

I wonder the number of books borrowed was decreased sharply.

The school may enter summer vacation…

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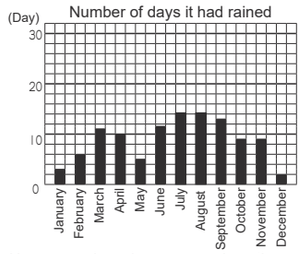
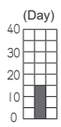
6 - 3 Tables and Bar Graphs
Bar Graphs (2)

Example 1 A girl created the bar graph by tallying the number of days it had rained in a year to determine when farmers will sow.

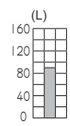


1. How many days does one mark on the scale represent?
   2 days
2. If it is the best to sow in the month with the least rainfall, which month should it be done?
   December

Example 2 In the bar graph below, how many units does one mark on the scale represent? How many units are shown in the bar?

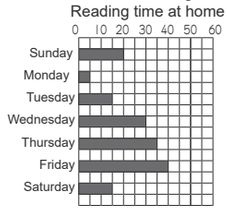
1. 

One mark
5 days
The bar shows
15 days

2. 

One mark
20 L
The bar shows
90 L

1. A boy created the bar graph by tallying the number of minutes he read at home last week to calculate how many days he needs to finish current reading book.

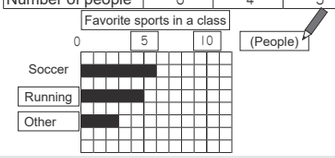


1. How many minutes does one mark on the scale represent?
   5 minutes
2. How many minutes did he read on Thursday?
   35 minutes

Example 3 Construct the bar graph by using the table below.

Favorite sports in a class

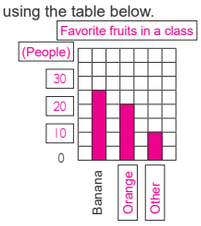
Favorite sports	Soccer	Running	Other	Total
Number of people	6	4	3	13



2. Construct the bar graph by using the table below.

Favorite fruits in a class

Favorite fruits	Number of people
Banana	25
Orange	20
Other	10



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6 - 4 Tables and Bar Graphs
Organizing Data Using Tables

Example 1 The tables below show what types of weather there was in June, July, and August to determine harvesting time.

Weather in June

Type of weather	Number of days (Days)
Sunny	6
Cloudy	10
Rainy	14
Total	30

Weather in July

Type of weather	Number of days (Days)
Sunny	11
Cloudy	6
Rainy	14
Total	31

Weather in August

Type of weather	Number of days (Days)
Sunny	15
Cloudy	5
Rainy	11
Total	31

1. Which month had the most number of sunny days?
   August
2. Fill in the blanks to make the combined table.

Type \ Month	June	July	August	Total
Sunny	6	11	15	32
Cloudy	10	6	5	21
Rainy	14	14	11	39
Total	30	31	31	92

The combined table is easy to see and compare data.
From June to August, the number of sunny days is increasing.

1. The tables below show the total sales for a clothing store for March, April, and May. The store owner is thinking of the number of clothes for store.

Sales for March

Type of item	Number of Pieces
T-shirt	26
Shirt	50
Hoodie	34
Total	110

Sales for April

Type of item	Number of Pieces
T-shirt	32
Shirt	41
Hoodie	17
Total	90

Sales for May

Type of item	Number of Pieces
T-shirt	52
Shirt	11
Hoodie	12
Total	75

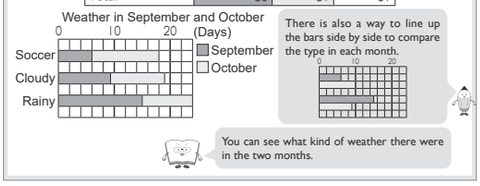
1. Fill in the blanks to make the combined table.

Type \ Month	March	April	May	Total
T-shirt	26	32	52	110
Shirt	50	41	11	102
Hoodie	34	17	12	63
Total	110	90	75	275

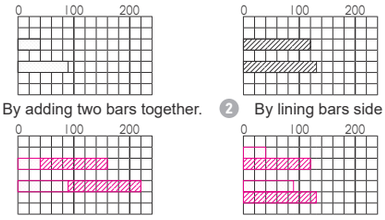
2. In which month were the most T-shirts sold?
   May

Example 2 The tables below show what types of weather were more in September and October. Combine the bar graphs.

Type \ Month	September	October	Total
Sunny	6	12	18
Cloudy	9	10	19
Rainy	15	9	24
Total	30	31	61



2. Combine the bar graphs in the following ways.



6 - 5 Tables and Bar Graphs — Review

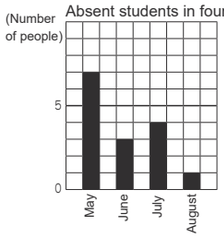
1 Find the number of people who were surveyed by using tally marks. The table below summarizes the results of a class survey about the best three favorite fruits. Convert the tally into numerals and sort out the numbers in the table below.

Apple	Banana	Avocado	Mango	Mango	Mango
Banana	Orange	Banana	Banana	Orange	Banana
Grape	Mango	Banana	Mango	Orange	
Orange	Watermelon	Orange	Orange	Banana	
Banana	Banana	Mango	Mango	Banana	

Banana	𝍸 𝍸
Mango	𝍸 //
Orange	𝍸 /
Other	////

Favorite fruits	Banana	Mango	Orange	Other	**Total**
Number of people	10	7	6	4	27

2 A girl created the bar graph by tallying the number of students absent from her class over four months to write an article for class newspaper.



1. How many students were absent in July? [4] students
2. How many students were absent altogether? [15] students

3 In the bar graph below, how many units does one mark on the scale represent? how many units are shown in the bar?

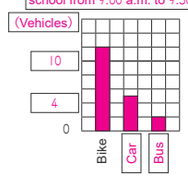
1. (cm) 40, 20, 0 — One mark [5] cm — The bar shows [25] cm
2. (People) 400, 300, 200, 100, 0 — One mark [50] people — The bar shows [350] people

4 Construct the bar graph by using the table below.

Vehicles that passed in front of school from 9:00 a.m. to 9:30 a.m.

Kind	Number of vehicles (Vehicles)
Bike	12
Car	5
Bus	2

Vehicles that passed in front of school from 9:00 a.m. to 9:30 a.m.



5 The tables below show the total sales for a stationary shop for March, April, and May. Fill in the blanks to make the combined table.

Sales for March

Type of item	Number of Pieces
Pen	18
Notebook	16
Other	12
Total	46

Sales for April

Type of item	Number of Pieces
Pen	19
Notebook	16
Other	8
Total	43

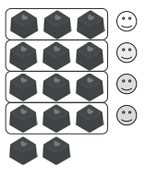
Sales for May

Type of item	Number of Pieces
Pen	18
Notebook	17
Other	10
Total	45

Type \ Month	March	April	May	**Total**
Pen	18	19	18	55
Notebook	16	16	17	49
Other	12	8	10	30
Total	46	43	45	134

7 - 1 Division with Remainders — How Many People ?

Example There are 14 chocolates. If we give 3 chocolates to each child, how many children can get chocolates?



If you divide 14 chocolates by giving 3 to each child, you can give chocolates to 4 children and 2 will be left.

You can write the math sentence as follows:

14 ÷ 3 = 4 R 2

Answer [4] children can get chocolates and [2] chocolates will be left.

Answer the following questions.

1 There are 21 flowers. If we give 5 flowers to each person, how many people can get flowers?

Math sentence: 21 ÷ 5 = 4 R 1

Answer [4] people can get flowers and [1] flower will be left.

2 There are 31 biscuits. If we give 6 biscuits to each child, how many children can get biscuits?

Math sentence: 31 ÷ 6 = 5 R 1

Answer [5] children can get biscuits and [1] biscuit will be left.

3 There is a ribbon that is 60 cm long. We need pieces of ribbon that are 7 cm long each. How many pieces of ribbon can we get?

Math sentence: 60 ÷ 7 = 8 R 4

Answer We can get [8] pieces of ribbon and [4] cm of ribbon will be left.

7 - 2 Division with Remainders — How Many for One Person ?

Example There are 16 biscuits. If we divide evenly them among 3 people, how many biscuits will each person get? How many biscuits will be left?

When each person gets

- 4 biscuits → [4] × 3 = 12 (16 − 12) → 4 biscuits are left
- 5 biscuits → [5] × 3 = 15 (16 − 15) → 1 biscuits are left
- 6 biscuits → [6] × 3 = 18 (16 − 18) → 2 biscuits short

Math sentence: 16 ÷ 3 = 5 R 1

Answer Each person can get [5] biscuits. [1] biscuit will be left.

Answer the following questions.

1 There are 14 pieces of candy. If we divide them evenly among 4 children, how many pieces of candy will each child get?

Math sentence: 14 ÷ 4 = 3 R 2

Answer Each child can get [3] pieces of candy and [2] pieces will be left.

2 There are 23 pencils. If 5 students divide them evenly, how many pencils will each student get?

Math sentence: 23 ÷ 5 = 4 R 3

Answer Each student can get [4] pencils and [3] pencils will be left.

3 There are 40 lemons. If we divide them evenly among 7 people, how many lemons will each person get?

Math sentence: 40 ÷ 7 = 5 R 5

Answer Each people can get [5] lemons and [5] lemons will be left.

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7 - 3 Division with Remainders
Checking the Answer

Instruction You can check the answer to the division of 23 ÷ 4 by doing the calculation shown below.

23 ÷ 4 = 5 R 3
4 × 5 + 3

23 ÷ 4 = 5 R 3
4 × 5 + 3 = 23

Example Calculate the following and check the answer by writing the numbers in the □.

35 ÷ 4 = 8 R 3

Check the answer
4 × 8 + 3 = 35

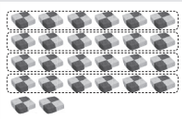
Calculate the following problems and check the answer by writing the numbers in the □.

1. 33 ÷ 4 = 8 R 1
   Check the answer: 4 × 8 + 1 = 33
2. 15 ÷ 9 = 1 R 6
   Check the answer: 9 × 1 + 6 = 15
3. 14 ÷ 3 = 4 R 2
   Check the answer: 3 × 4 + 2 = 14
4. 24 ÷ 9 = 2 R 6
   Check the answer: 9 × 2 + 6 = 24
5. 51 ÷ 8 = 6 R 3
   Check the answer: 8 × 6 + 3 = 51
6. 33 ÷ 9 = 3 R 6
   Check the answer: 9 × 3 + 6 = 33

Look at 2, 4 and 6. The dividends are "15," "24," and "33," respectively. If the dividends will be "42" and "51," how about the answers?

7 - 4 Division with Remainders
Division Problems

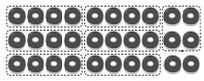
Example There are 26 biscuits. We are going to divide the biscuits so each person can get 6 biscuits. How many people can get biscuits and how many biscuits will be left?



Math sentence: 26 ÷ 6 = 4 R 2

Answer: 4 people can get biscuits and 2 biscuits will be left.

Answer the following questions.



1. There are 30 donuts. We are going to divide the donuts so each child can get 4 donuts. How many children can get donuts and how many donuts will be left?
   Math sentence: 30 ÷ 4 = 7 R 2
   Answer: 7 children can get donuts and 2 donuts will be left.
2. We are dividing 32 chocolates among 9 people evenly. How many chocolates will each person get and how many chocolates will be left?
   Math sentence: 32 ÷ 9 = 3 R 5
   Answer: Each person can get 3 chocolates and 5 chocolates will be left.
3. There are 45 sheets of coloured paper. There are 8 students and each student will receive 5 sheets each. Will there be enough coloured paper?
   Math sentence: 45 ÷ 8 = 5 R 5
   Answer: There are enough sheets of coloured paper.

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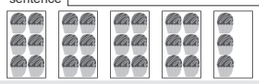
7 - 5 Division with Remainders
Problems Dealing with Remainders (1)

Example There are 27 sweets. We are going to put 6 sweets in one box. How many boxes do we need if we put all sweets in boxes?

27 ÷ 6 = 4 R3. If we have 4 boxes, the remaining 3 sweets do not fit in the box. There is another box to put the remaining 3 sweets.

Math sentence: 27 ÷ 6 = 4 R 3 4 + 1 = 5



Answer: 5 boxes

Answer the following questions.

1. There are 30 balls. We are going to put all the balls in boxes, 4 balls per box. How many boxes do we need?
   Math sentence: 30 ÷ 4 = 7 R 2 7 + 1 = 8
   Answer: 9 boxes
2. There are 43 children. Five children are going to sit on one bench. How many benches are needed so all the children can sit on benches?
   Math sentence: 43 ÷ 5 = 8 R 3 8 + 1 = 9
   Answer: 9 benches
3. There is a 78 page book. If I read 8 pages in one day, how many days will it take me to finish reading this book?
   Math sentence: 78 ÷ 8 = 9 R 6 9 + 1 = 10
   Answer: 10 days

7 - 6 Division with Remainders
Problems Dealing with Remainders (2)

Example We have 45 flowers. We are making bouquets that have 7 flowers each. How many bouquets can we make?

45 ÷ 7 = 6 R3. We can make 6 bouquets and 3 flowers will be left. The remaining 3 flowers are not enough to make a bouquet because 7 flowers are necessary to make a bouquet.

Math sentence: 45 ÷ 7 = 6 R 3

Answer: 6 bouquets

Answer the following questions.

1. There are 47 buttons. We need 7 buttons to make one shirt. How many shirts can we make in total?
   Math sentence: 47 ÷ 7 = 6 R 5
   Answer: 6 shirts
2. We are making fresh orange juice. There are 26 oranges. We need 4 oranges to make a glass of juice. How many glasses of orange juice can we make?
   Math sentence: 26 ÷ 4 = 6 R 2
   Answer: 6 glasses of juice
3. There is a bookshelf that is 28 cm wide. We want to put books that are 3 cm wide each on the shelf. How many of these books can we put on the bookshelf?
   Math sentence: 28 ÷ 3 = 9 R 1
   Answer: 9 books

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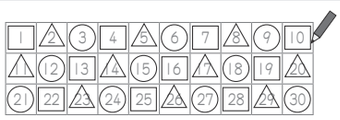
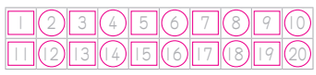
7 - 7 Division with Remainders — Remainders (1)

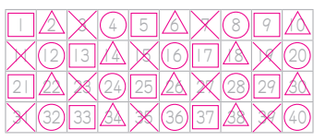
Example Divide the numbers in the following table by 3. Put a ◯ for divisible numbers, a □ for numbers with R 1, and a △ for numbers with R 2.



1 Divide the numbers in the following table by 2. Put a ◯ for divisible numbers and a □ for numbers with R 1.



2 Divide the numbers in the following table by 4. Put a ◯ for divisible numbers, a □ for numbers with R 1, a △ for numbers with R 2 and a ✕ for numbers with R 3.



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7 - 8 Division with Remainders — Remainders (2)

Example The following table shows the remainders. Write the numbers in the blanks.

$2 \div 2 = 1$ R 0

	2	3	4	5	6	7	8	9	10	11
÷2	1	1	2	2	3	3	4	4	5	5
R	0	1	0	1	0	1	0	1	0	1

$2 \div 2 = 1$, so it is divisible and write "0." Then $3 \div 2 = 1$ R 1, so write "1."

The following tables show the remainders. Write the numbers in the blanks.

1

	3	4	5	6	7	8	9	10	11	12
÷3	1	1	1	2	2	2	3	3	3	4
R	0	1	2	0	1	2	0	1	2	0

2

	4	5	6	7	8	9	10	11	12	13
÷4	1	1	1	1	2	2	2	2	3	3
R	0	1	2	3	0	1	2	3	0	1

3

	5	6	7	8	9	10	11	12	13	14
÷5	1	1	1	1	1	2	2	2	2	2
R	0	1	2	3	4	0	1	2	3	4

4

	6	7	8	9	10	11	12	13	14	15
÷6	1	1	1	1	1	1	2	2	2	2
R	0	1	2	3	4	5	0	1	2	3

5

	7	8	9	10	11	12	13	14	15	16
÷7	1	1	1	1	1	1	1	2	2	2
R	0	1	2	3	4	5	6	0	1	2

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7 - 9 Division with Remainders — Review

1 Calculate the following problems and check the answer by writing the numbers in the □.

① $25 \div 6 = 4$ R 1
Check the answer: $6 \times 4 + 1 = 25$

② $18 \div 7 = 2$ R 4
Check the answer: $7 \times 2 + 4 = 18$

③ $35 \div 8 = 8$ R 3
Check the answer: $4 \times 8 + 3 = 35$

④ $53 \div 8 = 6$ R 5
Check the answer: $8 \times 6 + 5 = 53$

⑤ $37 \div 4 = 9$ R 1
Check the answer: $4 \times 9 + 1 = 37$

⑥ $16 \div 9 = 1$ R 7
Check the answer: $9 \times 1 + 7 = 16$

⑦ $11 \div 3 = 3$ R 2
Check the answer: $3 \times 3 + 2 = 11$

⑧ $25 \div 9 = 2$ R 7
Check the answer: $9 \times 2 + 7 = 25$

⑨ $47 \div 6 = 7$ R 5
Check the answer: $6 \times 7 + 5 = 47$

⑩ $34 \div 9 = 3$ R 7
Check the answer: $9 \times 3 + 7 = 34$

Look at the above division problems ①, ⑧ and ⑩. The dividends are "16," "25," and "34," respectively. If the dividends will be "43," "52," "61," "70," how about the answers? Can you find an interesting rule?

2 Explain the mistakes in the following calculations. Then calculate them correctly.

① $13 \div 2 = 5$ R 3
$13 \div 2 = 6$ R 1

② $41 \div 6 = 7$ R 1
$41 \div 6 = 6$ R 5

③ $55 \div 6 = 9$ R 2
$55 \div 6 = 9$ R 1

④ $35 \div 7 = 4$ R 7
$35 \div 7 = 5$

3 Answer the following questions.

① There are 40 apples. We are going to divide the apples so each child can get 6 apples. How many children can get apples and how many apples will be left?

Math sentence: $40 \div 6 = 6$ R 4
Answer: 6 children can get apples and 4 apples will be left.

② We are dividing 25 chocolates among 3 people evenly. How many chocolates will each person get and how many chocolates will be left?

Math sentence: $25 \div 3 = 8$ R 1
Answer: Each person can get 8 chocolates and 1 chocolate will be left.

③ There is a 56-page book. If I read 9 pages in one day, how many days will it take me to finish reading this book?

Math sentence: $56 \div 9 = 6$ R 2 $\quad 6 + 1 = 7$
Answer: 7 days

Let's think about how to handle the number of remainder.

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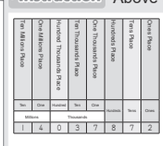
8 - 1 Numbers Greater than 10000
How to Express Numbers

Instruction Above the "One Thousands Place," there are the "Ten Thousands Place," "Hundreds Thousands Place," "One millions Place," "Ten Millions Place," respectively.



For example, "14037872" can be read as "fourteen million, thirty-seven thousand, eight hundred seventy-two."
(*Population of Tokyo, the capital of Japan, 2021)

Example Write the following number in the table and read it.
9425622 (*population of London, the capital of England, 2020)

Ten Millions	One Millions	Hundred Thousands	Ten Thousands	One Thousands	Hundreds	Tens	Ones
	9	4	2	5	6	2	2

In many countries, the comma (,) or space are added every three digits to make it easier to read, like 9,425,622 or 9 425 622.

Nine million, four hundred twenty-five thousand, six hundred twenty-two.

Write the following numbers in the table and read it.

1. 8175133
(*Population of New York City, USA, 2020)

Ten Millions	One Millions	Hundred Thousands	Ten Thousands	One Thousands	Hundreds	Tens	Ones
	8	1	7	5	1	3	3

Eight million, one hundred seventy-five thousand, one hundred thirty-three.

2. 44817795
(*Number of tickets sold in the Tokyo Olympic, 2021)

Ten Millions	One Millions	Hundred Thousands	Ten Thousands	One Thousands	Hundreds	Tens	Ones
	4	4	8	1	7	9	5

Four million, four hundred eighty-one thousand, seven hundred ninety-five.

3. 35091944
(*Number of newspapers published in Japan during 2020)

Ten Millions	One Millions	Hundred Thousands	Ten Thousands	One Thousands	Hundreds	Tens	Ones
3	5	0	9	1	9	4	4

Thirty-five million, ninety-one thousand, nine hundred forty-four.

8 - 2 Numbers Greater than 10000
Structure of Numbers (1)

Example Write the numbers in the ☐.

1. 95881⁹8 is made of [9] one millions, [5] hundred thousands, [8] ten thousands, [8] one thousands, [1] hundreds, [9] tens and [8] ones.
(*Population of Jakarta, the capital of Indonesia, 2016)

Focus on each individual number. Otherwise, there could be many answers.

2. The number made of 4 one millions, 1 ten thousands, 7 one thousands, 5 tens and 2 ones is [4017056].
(*Car sales in Germany, 2019)

Write the numbers in the ☐.

1. 1538762 is made of [1] one millions, [5] one hundred thousands, [3] ten thousands, [8] one thousands, [7] hundreds, [6] tens and [2] ones.
(*Number of Mobile Phone production in Japan during March 2021)

2. 1705685 is made of [1] one millions, [7] hundred thousands, [5] one thousands, [6] hundreds, [8] tens and [5] ones.
(*Cumulative number of people infected with COVID-19 by October 2021)

Focus on each individual number. Otherwise, there could be many answers.

3. The number made of 2 ten millions, 1 one millions, 8 hundred thousands, 9 ten thousands, 3 one thousands tens and 2 tens is [21893020]. (*Population of Beijing City, the capital of China, 2019)

4. The number made of 2 ten millions, 5 one millions, 7 hundred thousands, 6 ten thousands, 8 one thousands, 6 hundreds, 7 tens and 7 ones is [25768677]. (*Car sales of China, 2019)

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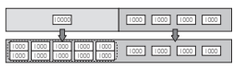
8 - 3 Numbers Greater than 10000
Structure of Numbers (2)

Example How many "one thousands (1000's)" make up the number 14000?

14000 is made of 10000 and 4000.



14000 → 10000 → [10] one thousands
14000 → 4000 → [4] one thousands
[14] one thousands

Write the numbers in the ☐.

1. How many "one thousands (1000's)" make up the number 13000?

13000 → 10000 → [10] one thousands
13000 → 3000 → [3] one thousands
[13] one thousands

2. How many "one thousands (1000's)" make up the number 25000?

25000 → 20000 → [20] one thousands
25000 → 5000 → [5] one thousands
[25] one thousands

3. How many "one thousands (1000's)" make up the number 78000?

78000 → 70000 → [70] one thousands
78000 → 8000 → [8] one thousands
[78] one thousands

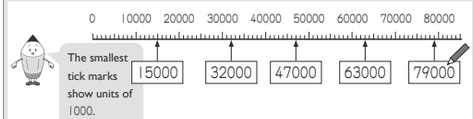
4. [56] one thousands (1000's) make up the number 56000.

5. [49] one thousands (1000's) make up the number 49000.

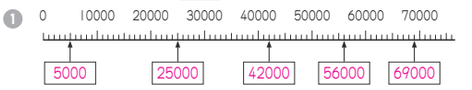
6. [300] one thousands (1000's) make up the number 300000.

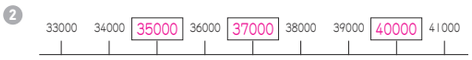
8 - 4 Numbers Greater than 10000
Number Line

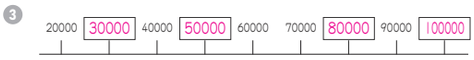
Example Write the numbers in the ☐.

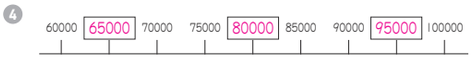


Write the numbers in the ☐.

1. 

2. 

3. 

4. 

5. 

6. 

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8 - 5 Numbers Greater than 10000
Comparing Numbers

Example Calculate the following, and fill in the ☐ with the appropriate symbol, =, >, or <.

① 30000 + 40000 [>] 60000

② 68000 [=] 60000 + 8000

30000 + 40000 = 70000
So, 70000 is larger than 60000.

Calculate the following and write the appropriate symbol, =, >, or < in the ☐.

① 40000 + 30000 [<] 80000 ② 10000 + 60000 [=] 70000

③ 20000 + 30000 [<] 60000 ④ 50000 + 80000 [>] 120000

⑤ 60000 − 40000 [>] 10000 ⑥ 70000 − 50000 [=] 20000

⑦ 90000 − 10000 [=] 80000 ⑧ 40000 − 30000 [<] 70000

⑨ 28000 [=] 20000 + 8000 ⑩ 36000 [<] 30000 + 60000

⑪ 14000 [<] 20000 − 4000 ⑫ 56000 [<] 60000 − 3000

⑬ 45000 [>] 50000 − 6000 ⑭ 72000 [=] 80000 − 8000

⑮ 7 million [=] 5 million + 2 million

⑯ 15 million − 8 million [>] 6 million

8 - 6 Numbers Greater than 10000
Various Expressions of Numbers

Example What can we say about the number 120000? Fill in the ☐ with the appropriate numbers.

① It is made up of 100000 and [20000] added together.

② It is [80000] less than 200000.

③ It is made of [12] 10000's.

One number can be expressed various ways, can't we? Regarding (3), we think that how many 10000's there are.

1 What can we say about the number 760000? Write the appropriate numbers in the ☐.

① It is made up of 700000 and [60000] added together.

② It is [40000] less than 800000.

③ It is made of [76] 10000's.

2 What can we say about the number 380000? Fill in the ☐ with appropriate numbers.

① It is made up of 300000 and [80000] added together.

② It is [20000] less than 400000.

③ It is made up [38] 10000's.

3 What can we say about the number 12 million (12000000)? Fill in the ☐ with appropriate numbers.

① It is made up of 10 million and [2 million] added together.

② It is [8 million] less than 20 million.

③ It is made up [12] one millions.

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8 - 7 Numbers Greater than 10000
Numbers Multiplied by 10 and 100

Example 1 What number is 10 times as much as 25?

25 —10 times→ 250

25 × 10 = [250]

Hundreds	Tens	Ones
	2	5
2	5	0

10 times

When you multiply a number by 10, all digits in the number go up one place. The answer is the number made by placing a 0 to the right of the original number.

1 What are the numbers that are 10 times the following numbers?

① 50 [500] ② 79 [790] ③ 38 [380]

④ 420 [4200] ⑤ 632 [6320] ⑥ 980 [9800]

Example 2 What number is 100 times as much as 25?

25 —10 times→ 250 —10 times→ 2500 (100 times)

25 × 100 = [2500]

One Thousands	Hundreds	Tens	Ones
		2	5
	2	5	0
2	5	0	0

10 times, 10 times → 100 times

2 What are the numbers that are 100 times the following numbers?

① 27 [2700] ② 90 [9000] ③ 100 [10000]

④ 785 [78500] ⑤ 6000 [600000] ⑥ 10000 [1000000]

8 - 8 Numbers Greater than 10000
Numbers Divided by 10, and 100000000

Example 1 What number is 200 divided by 10?

200 —Divided by 10→ 20

200 ÷ 10 = [20]

Hundreds	Tens	Ones
2	0	0
	2	0

Divided by 10

When a number with 0 in the ones place is divided by 10, each digit moves down one place. It remains the same number except with a 0 in the ones place.

1 When the following numbers are divided by 10, what do you get?

① 300 [30] ② 400 [40] ③ 250 [25]

④ 80 [8] ⑤ 3000 [300] ⑥ 10000 [1000]

Example 2 There is the "Hundred Million Place" above the "Ten Million Place." One hundred million is the number that is 10 times as much as ten million.

Hundred Million Place	Ten Million Place	One Million Place	Hundred Thousands Place	Ten Thousands Place	One Thousand Place	Hundreds Place	Tens Place	Ones Place
Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones
Millions			Thousands			Ones		
1	0	0	0	0	0	0	0	0

100000000 = 10000000 × 10

2 Write the appropriate numbers in the ☐.

① One hundred million is the number [10] times as much as ten million.

② One hundred million is made up of [10] ten millions.

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8 - 9 Numbers Greater than 10000
Review

1 Write the appropriate numbers in the ☐.

1. The digit in the hundred thousands place of 5285194 is [2], and digit in the ten thousands place is [8].
2. The digit in the one million place of 13729054 is [3], and the digit in the hundred thousands place is [7].
3. 4173968 is made of [4] one millions, [1] hundred thousands, [7] ten thousands, [3] one thousands, [9] hundreds, [6] tens and [8] ones.
4. 2603040 is made of [2] one millions, [6] hundred thousands, [3] thousands and [4] tens.
5. The number made of 4 ten millions, 7 one millions, 1 ten thousands, 2 one thousands, 5 tens and 8 ones is [47012058]
6. The number made of 3 ten millions, 5 hundred thousands, 8 ten thousands and 9 ones is [30508009].

Focus on each individual number. Otherwise, there could be many answers.

2 Write the numbers in the ☐.

1. [78] one thousands (1000's) make up the number 78000.
2. [34] one thousands (1000's) make up the number 34000.
3. [250] one thousands (1000's) make up the number 250000.

3 Write the numbers in the ☐.

1. 33000 34000 35000 36000 37000 [38000] 39000 [40000] 41000
2. 20000 30000 [40000] 50000 [60000] 70000 80000 [90000] [100000]
3. 100000 [400000] 500000 [700000]

4 Calculate the following and write the appropriate symbol, =, >, or < in the ☐.

1. 20000 + 40000 [=] 60000
2. 50000 + 50000 [>] 10000
3. 60000 − 30000 [<] 50000
4. 50000 − 3000 [>] 20000
5. 5 million + 2 million [=] 7 million

5 What can we say about the number 460000? Write the appropriate numbers in the ☐.

1. It is made up of 400000 and [60000] added together.
2. It is [40000] less than 500000.
3. It is made of [46] 10000's.

6 What are the numbers that are 10 times the following numbers?

1. 35 [350]
2. 670 [6700]
3. 893 [8930]

7 When the following numbers are divided by 10, what do you get?

1. 500 [50]
2. 6000 [600]
3. 10000 [1000]

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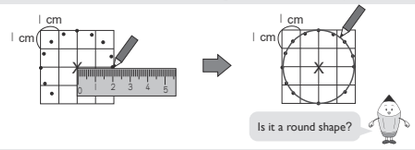
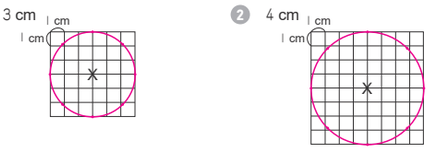
9 - 1 Circles and Spheres
Circles (1)

Example 1 From the X, measure 2 cm with your ruler and draw dots. Turn the ruler and keep drawing dots. Then connect these dots together. What shape is formed?



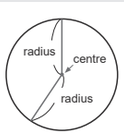
1 From the X, measure with your ruler the following lengths and draw dots together. Turn the ruler and keep drawing dots. Then connect these dots.

1. 3 cm
2. 4 cm



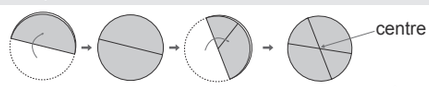
Instruction Circle

- A round shape consists of points that have the same distance from the middle point. This is called a **circle**.
- The middle point is called the **centre**.
- A straight line from the centre to any point on the circle is called the **radius**.



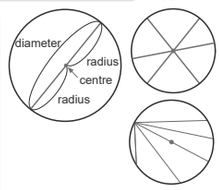
In a circle, the length of every radius is the same.

How do you find the centre of a circle?



Cut out a circle from paper. Fold it in half then unfold it. Repeat this several times. Where do the fold marks overlap?

- Any straight line that passes through the center of the circle and whose endpoints lie on the circle is called a **diameter**.
- The length of the diameter is twice the length of the radius.
- There are many diameters that pass through the center.
- Diameter is the longest straight line drawn between two points on the surrounding circle.



Example 2 Fill in the ☐ with words or numbers.

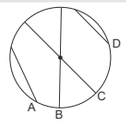
1. A circle consists of points that have the same distance from the [centre].
2. A diameter is [2] times its radius.
3. There are many [diameters] that pass through the center.

2 Fill in the ☐ with words or numbers.

1. The length of the [diameter] is twice the length of the radius.
2. All the diameters go through the [centre] of the circle.
3. The straight line from the centre to any point on the circle is called the [radius].
4. [Diamete] is the longest straight line drawn between two points on the surrounding circle.

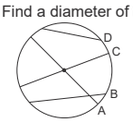
9 - 2 Circles and Spheres
Circles (2)

Example 1 Find a diameter of the circle below.



B, C

1 Find a diameter of the circle below.

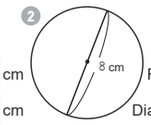


A, C

Example 2 How many cm are the radius and diameter of the following circles?

① 

Radius 3 cm
Diameter 6 cm

② 

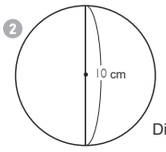
Radius 4 cm
Diameter 8 cm

③ If a circle has a 6 cm radius, the diameter is 12 cm.

2 How many cm are the radius and diameter of the following circles?

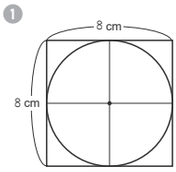
① 

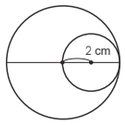
Radius 2 cm
Diameter 4 cm

② 

Radius 5 cm
Diameter 10 cm

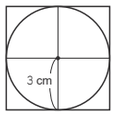
Example 3 How many cm are the diameter and radius of the following circles?

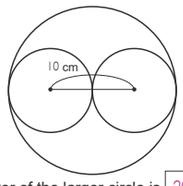
① 

② 

Diameter is 8 cm. Diameter of the larger circle is 8 cm.
Radius is 4 cm. Diameter of the smaller circle is 4 cm.

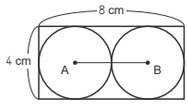
3 How many cm are the diameter and radius of the following circles?

① 

② 

Diameter is 6 cm. Diameter of the larger circle is 20 cm.
Radius is 3 cm. Diameter of the smaller circle is 10 cm.

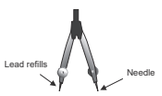
3 How long is the length of AB?



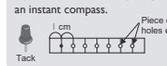
The length of AB is 4 cm.

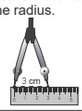
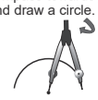
9 - 3 Circles and Spheres
Circles (3)

Instruction Let's draw a circle with a radius of 3 cm using a compass.

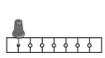
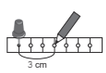
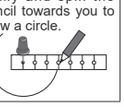


If you don't have a compass, you can create an instant compass.

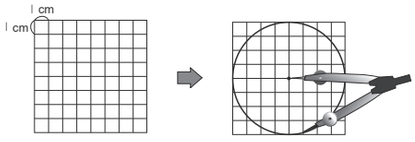


1. Open the compass based on the length of the radius.	2. Place the compass needle at the centre.	3. Start turning the compass towards you and draw a circle.
		

Drawing with an instant compass

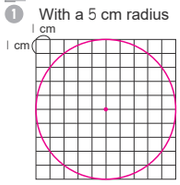
1. Place the tack at the centre.	2. Place a pencil in the third hole.	3. Hold the tack down firmly and spin the pencil towards you to draw a circle.
		

Example Draw a circle with a radius of 4 cm using a compass.

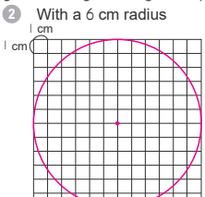


1 Draw a circle with the following radius lengths using a compass.

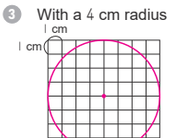
① With a 5 cm radius



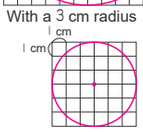
② With a 6 cm radius



③ With a 4 cm radius

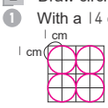


④ With a 3 cm radius

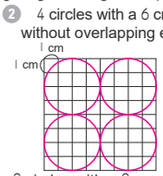


2 Draw circles with the following lengths using a compass.

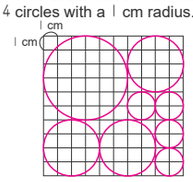
① With a 14 cm diameter



② 4 circles with a 6 cm diameter without overlapping each other



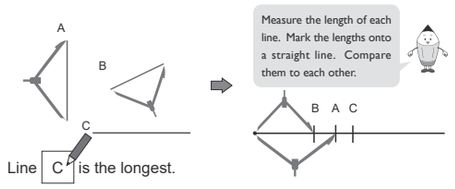
3 One circle with a 3 cm radius, 3 circles with a 2 cm radius, and 4 circles with a 1 cm radius.



The answer is not only one. Let's think several answers.

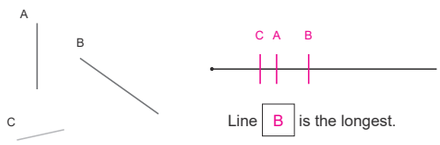
9 - 4 Circles and Spheres
Ways to Use a Compass

Example 1 Compare the lengths of the lines using a compass. Which of the three straight lines below is the longest?

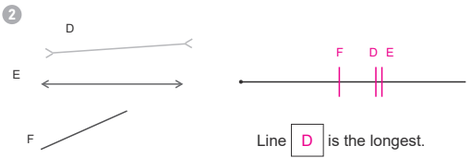


Line C is the longest.

1 Compare the lengths of the lines. Which of the following three straight lines below is the longest?

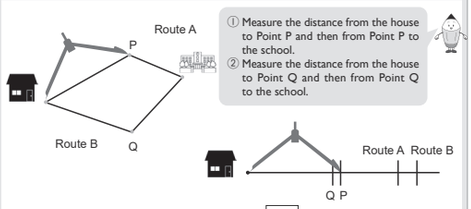
① 

Line B is the longest.

② 

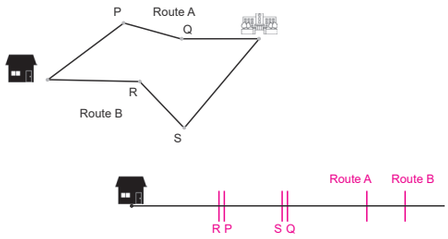
Line D is the longest.

Example 2 Measure the travel distance from the house to the school. Which route is closer to the house?



Route A is closer to the house.

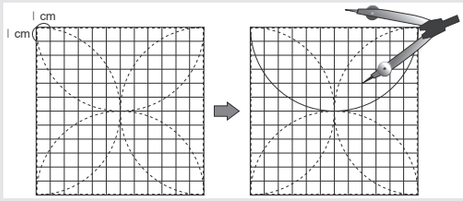
2 Measure the travel distance from the house to the school. Which route is closer to the house?



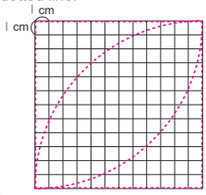
Route A is closer to the house.

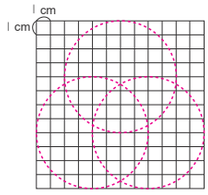
9 - 5 Circles and Spheres
Practicing How to Use a Compass

Example 1 Using a compass, let's make a pattern by tracing over the dotted line.

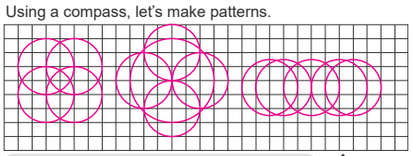


1 Using a compass, let's make a pattern by tracing over the dotted line.

① 

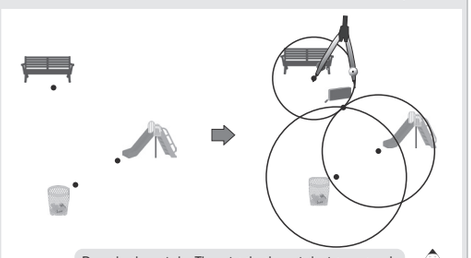
② 

2 Using a compass, let's make patterns.



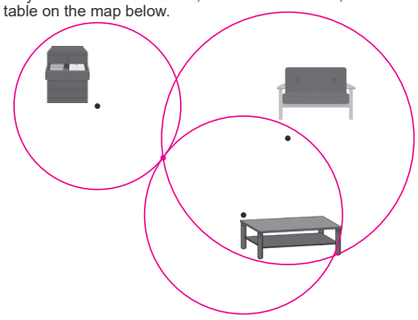
For example, let's draw such a pattern on a notebook using a compass.

Example 2 A girl is playing a game. Find the answer by using the following hints and a compass.
The wallet is 3 cm from the bench, 4 cm from the slide, and 5 cm from the trash bin on the map below.



Draw the three circles. The point the three circles intersect each other is the place where she dropped her wallet.

A boy is playing game. Find the answer using the following hints and a compass.
The key is 6 cm from the chest, 9 cm from the sofa, and 7 cm from the table on the map below.



9 - 6 Circles and Spheres
Spheres

Example 1 Look at the following objects from directly above or from the side. What kind of shapes do you see? Match the objects to the shapes they make.

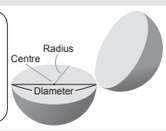
	1	2	3
From directly above	●	●	●
From the side	●	●	■
Item	2, 4	1	3

1 Look at the following objects from directly above or from the side. What kind of shapes do you see? Match the objects to the shapes they make.

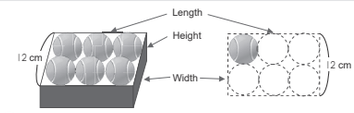
	1	2	3
From directly above	●	⬭	●
From the side	●	⬭	■
Item	2, 4	3	1

Instruction Sphere

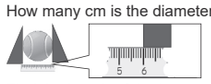
- An object that looks like a circle from any direction is called a **sphere**.
- When a sphere is cut in half, the centre, radius, and diameter of the cross-section are the same as the centre, radius, and diameter of the sphere.



Example 2 The balls are placed inside a box in rows as shown below.



1. How many cm is the diameter of one ball?



The diameter is 6 cm.

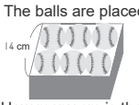
2. Find the length of the box.

The length is 18 cm.

3. Find the height of the box.

The height of the box is 6 cm.

2 The balls are placed inside a box in rows as shown below.



1. How many cm is the diameter of one ball?

The diameter is 7 cm.

2. Find the length of the box.

The length is 21 cm.

3. Find the total length around the bottom of the box.

The total length is 70 cm.

4. If you can put balls into the following container. Find the height of container.

The height is 14 cm.

9 - 7 Circles and Spheres
Review

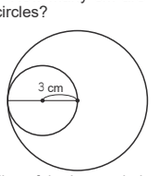
1 Fill in the ☐ with words or numbers.

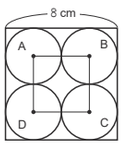
1. A circle consists of points that have the same distance from the centre.
2. A diameter is twice its radius.

2 How many cm are the radius and diameter of the following circles?

1. If a circle has a 4 cm radius, the diameter is 8 cm.
2. If a circle has a 24 cm diameter, the radius is 12 cm.

3 How many cm are the diameter and radius of the following circles?

1. 

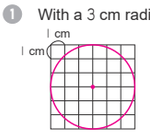
2. 

Radius of the larger circle is 6 cm. The length of AB is 4 cm.

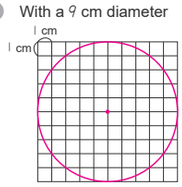
Diameter of the smaller circle is 3 cm. The length of ABCD is 16 cm.

4 Draw a circle with the following length of radius using a compass.

1. With a 3 cm radius

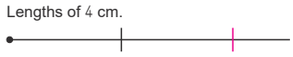


2. With a 9 cm diameter



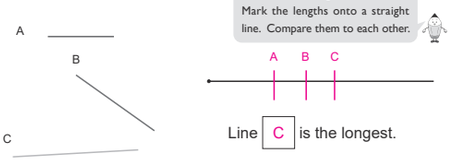
5 Mark the straight lines into the following lengths from the point.

1. Lengths of 4 cm.



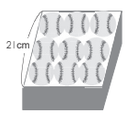
2. Length of 3 cm.

6 Compare the lengths of the lines. Which of the following three straight lines below is the longest?

1. 

Line C is the longest.

7 The balls are placed inside a box in rows as shown below.



1. How many cm is the diameter of a ball?

The diameter is 7 cm.

2. Find the total length around the bottom of the box.

The total length is 84 cm.

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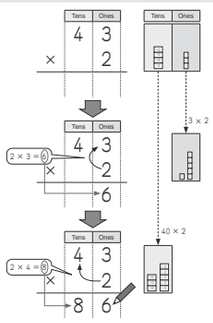
10 - 1 Multiplication Algorithm-1
2-Digit Number × 1-Digit Number (1)

Example Calculate 43 × 2 by using the algorithm.



Line up the numbers vertically in each place.

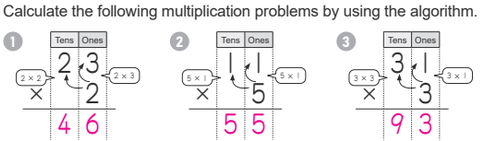
2 times 3 is 6.
(This is actually 3 × 2 = 6.)
Write a 6 in the ones place.

For convenience, the multiplicand and multiplier are reversed!

2 times 4 is 8.
(This is actually 40 × 2 = 80.)
Write a 8 in the tens place.

43 × 2 = 86

Calculate the following multiplication problems by using the algorithm.



4 24 × 2 5 32 × 3 6 12 × 4 7 21 × 3

8 33 × 3 9 42 × 2 10 23 × 3 11 34 × 2

4	48	5	96	6	48	7	63
8	99	9	84	10	69	11	68

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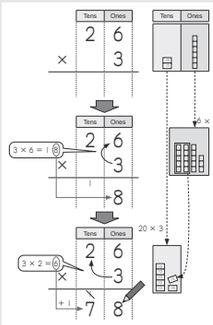
10 - 2 Multiplication Algorithm-1
2-Digit Number × 1-Digit Number (2)

Example Calculate 26 × 3 by using the algorithm.



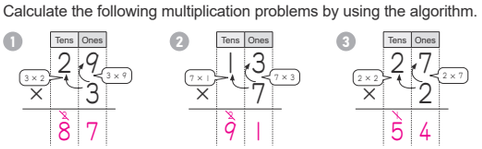
Line up the numbers vertically in each place.

3 times 6 is 18.
(This is actually 6 × 3 = 18.)
Write an 8 in the ones place, and regroup 1 into the tens place.

3 times 2 is 6.
(This is actually 20 × 3 = 60.)
Add the 6 and the 1 that was regrouped to get 7.
Write a 7 in the tens place.

26 × 3 = 78

Calculate the following multiplication problems by using the algorithm.



4 17 × 5 5 35 × 2 6 16 × 6 7 23 × 4

8 36 × 2 9 28 × 3 10 45 × 2 11 12 × 8

4	85	5	70	6	96	7	92
8	72	9	84	10	90	11	96

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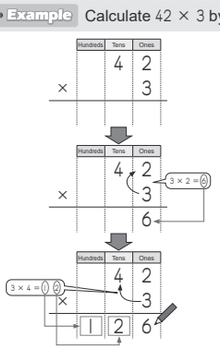
10 - 3 Multiplication Algorithm-1
2-Digit Number × 1-Digit Number (3)

Example Calculate 42 × 3 by using the algorithm.



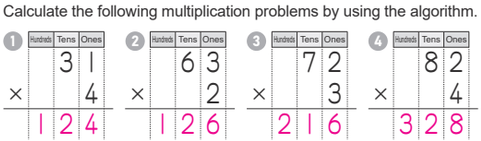
Line up the numbers vertically in each place.

3 times 2 is 6.
(This is actually 2 × 3 = 6.)
Write a 6 in the ones place.

3 times 4 is 12.
(This is actually 40 × 3 = 120.)
Write a 2 in the tens place and a 1 in the hundreds place.

42 × 3 = 126

Calculate the following multiplication problems by using the algorithm.



5 53 × 3 6 92 × 2 7 41 × 4 8 54 × 2

9 32 × 4 10 52 × 4 11 62 × 3 12 31 × 8

5	159	6	184	7	164	8	108
9	128	10	208	11	186	12	248

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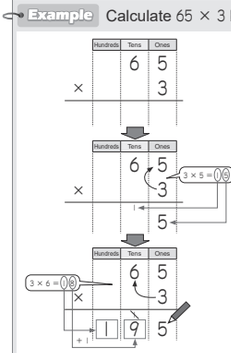
10 - 4 Multiplication Algorithm-1
2-Digit Number × 1-Digit Number (4)

Example Calculate 65 × 3 by using the algorithm.



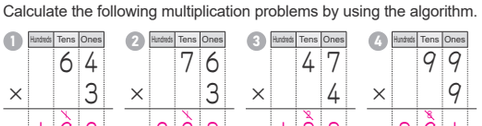
Line up the numbers vertically in each place.

3 times 5 is 15.
(This is actually 5 × 3 = 15.)
Regroup 1 into the tens place.
Write a 5 in the ones place.

3 times 6 is 18.
(This is actually 60 × 3 = 180.)
Add the 18 and 1 that was regrouped. It becomes 19.
Write a 9 in the tens place and a 1 in the hundreds place.

65 × 3 = 195

Calculate the following multiplication problems by using the algorithm.



5 55 × 6 6 38 × 5 7 42 × 8 8 68 × 7

9 27 × 6 10 78 × 5 11 93 × 5 12 37 × 8

5	330	6	190	7	336	8	476
9	162	10	390	11	465	12	296

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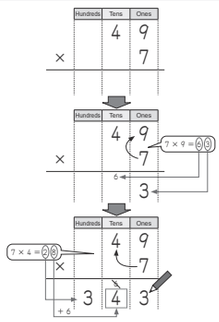
10 - 5 Multiplication Algorithm-1
2-Digit Number × 1-Digit Number (5)

Example Calculate 49 × 7 by using the algorithm.



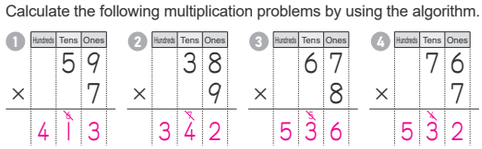
Line up the numbers vertically in each place.

7 times 9 is 63.
(This is actually 9 × 7 = 63.)
Regroup 6 into the tens place.
Write a 3 in the ones place.

7 times 4 is 28.
(This is actually 40 × 7 = 280.)
Add the 28 and the 6 that was regrouped. It becomes 34.
Write a 4 in the tens place and a 3 in the hundreds place.

49 × 7 = 343

Calculate the following multiplication problems by using the algorithm.



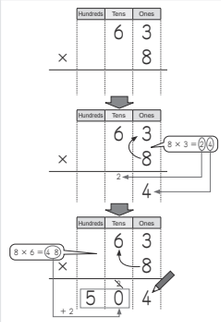
5 66 × 8 6 89 × 6 7 79 × 9 8 36 × 6

9 58 × 9 10 47 × 7 11 68 × 9 12 78 × 7

5	528	6	534	7	711	8	216
9	522	10	329	11	612	12	546

10 - 6 Multiplication Algorithm-1
2-Digit Number × 1-Digit Number (6)

Example Calculate 63 × 8 by using the algorithm.



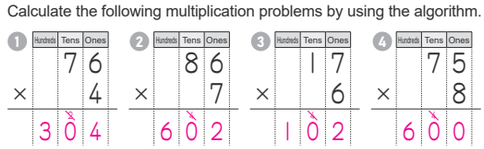
Line up the numbers vertically in each place.

8 times 3 is 24.
(This is actually 3 × 8 = 24.)
Regroup 2 into the tens place.
Write a 4 in the ones place.

8 times 6 is 48.
(This is actually 60 × 8 = 480.)
Add the 48 and the 2 that was regrouped. It becomes 50.
Write a 0 in the tens place and a 5 in the hundreds place.

63 × 8 = 504

Calculate the following multiplication problems by using the algorithm.



5 45 × 9 6 69 × 3 7 75 × 4 8 67 × 9

9 67 × 3 10 87 × 7 11 67 × 6 12 77 × 4

5	405	6	207	7	300	8	603
9	201	10	609	11	402	12	308

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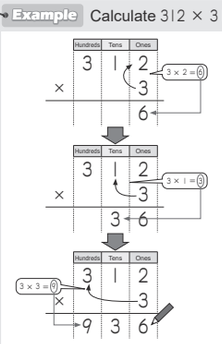
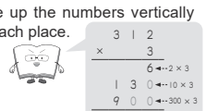
10 - 7 Multiplication Algorithm-1
3-Digit Number × 1-Digit Number (1)

Example Calculate 312 × 3 by using the algorithm.



Line up the numbers vertically in each place.



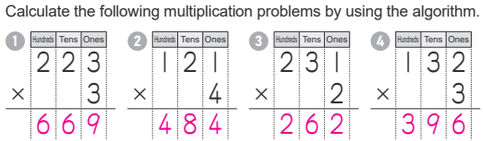
3 times 2 is 6.
(This is actually 2 × 3 = 6.)
Write a 6 in the ones place.

3 times 1 is 3
(This is actually 10 × 3 = 30.)
Write a 3 in the tens place.

3 times 3 is 9
(This is actually 300 × 3 = 900.)
Write a 9 in the hundreds place.

312 × 3 = 936

Calculate the following multiplication problems by using the algorithm.



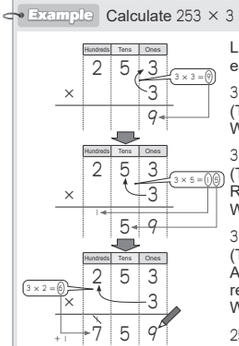
5 244 × 2 6 123 × 3 7 321 × 2 8 221 × 4

9 332 × 3 10 143 × 2 11 131 × 2 12 213 × 3

5	488	6	369	7	642	8	884
9	996	10	286	11	262	12	639

10 - 8 Multiplication Algorithm-1
3-Digit Number × 1-Digit Number (2)

Example Calculate 253 × 3 by using the algorithm.



Line up the numbers vertically in each place.

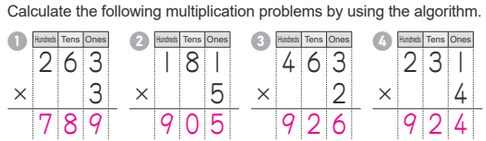
3 times 3 is 9.
(This is actually 3 × 3 = 9.)
Write a 9 in the ones place.

3 times 5 is 15.
(This is actually 50 × 3 = 150.)
Regroup 1 into the hundreds place.
Write a 5 in the tens place.

3 times 2 is 6.
(This is actually 200 × 3 = 600.)
Add the 6 and the 1 that was regrouped. It becomes 7.
Write a 7 in the hundreds place.

253 × 3 = 759

Calculate the following multiplication problems by using the algorithm.



5 492 × 2 6 242 × 4 7 172 × 3 8 141 × 6

9 364 × 2 10 273 × 3 11 461 × 2 12 392 × 2

5	984	6	968	7	516	8	846
9	728	10	819	11	922	12	784

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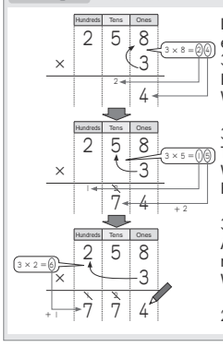
10 - 9 Multiplication Algorithm-I
3-Digit Number × 1-Digit Number (3)

Example Calculate 258 × 3 by using the algorithm.



Line up the numbers vertically in each place.
3 times 8 is 24.
Regroup 2 into the tens place.
Write a 4 in the ones place.

3 times 5 is 15.
The regrouped 2 and 5 make 7.
Write a 7 in the tens place.
Regroup 1 into the hundreds place.

3 times 2 is 6.
Add the 6 and the 1 that was regrouped. It becomes 7.
Write a 7 in the hundreds place.

258 × 3 = 774

Calculate the following multiplication problems by using the algorithm.

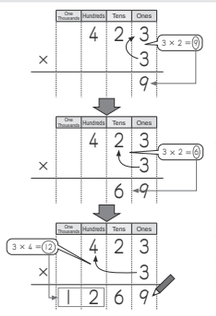
① 248 × 3 = 744
② 173 × 5 = 865
③ 269 × 3 = 807
④ 178 × 4 = 712

⑤ 298 × 2
⑥ 144 × 6
⑦ 153 × 5
⑧ 297 × 3
⑨ 134 × 7
⑩ 234 × 4
⑪ 164 × 6
⑫ 289 × 2

⑤	596	⑥	864	⑦	765	⑧	891
⑨	938	⑩	936	⑪	984	⑫	578

10 - 10 Multiplication Algorithm-I
3-Digit Number × 1-Digit Number (4)

Example Calculate 423 × 3 by using the algorithm.



Line up the numbers vertically in each place.

3 times 3 is 9.
Write a 9 in the ones place.

3 times 2 is 6.
Write a 6 in the tens place.

3 times 4 is 12.
Regroup 1 into the one thousands place.
Write a 2 in the hundreds place and a 1 in the one thousands place.

428 × 3 = 1269

Calculate the following multiplication problems by using the algorithm.

① 631 × 3 = 1893
② 743 × 2 = 1486
③ 523 × 3 = 1569

④ 621 × 4
⑤ 814 × 2
⑥ 822 × 4
⑦ 412 × 4
⑧ 711 × 7
⑨ 542 × 2
⑩ 923 × 3
⑪ 723 × 3

④	2484	⑤	1628	⑥	3288	⑦	1648
⑧	4977	⑨	1084	⑩	2769	⑪	2169

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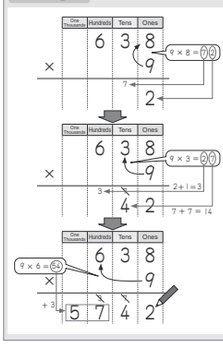
10 - 11 Multiplication Algorithm-I
3-Digit Number × 1-Digit Number (5)

Example Calculate 638 × 9 by using the algorithm.



Line up the numbers vertically in each place.

9 times 8 is 72.
Write a 2 in the ones place.
Regroup 7 into the tens place.

9 times 3 is 27.
The regrouped 7 and 7 make 14.
Write a 4 in the tens place and regroup 1 into the hundreds place.
The regrouped 1 and 2 make 3.
Regroup 3 into the hundreds place.

9 times 6 is 54.
The regrouped 3 and 4 make 7.
Write a 7 in the hundreds place.
Regroup 1 into the one thousands place.
Write a 2 in the hundreds place and a 1 in the one thousands place.

638 × 9 = 5742

Calculate the following multiplication problems by using the algorithm.

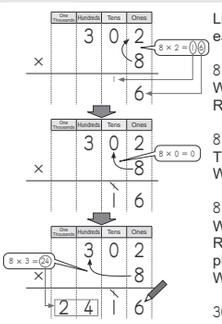
① 627 × 8 = 5016
② 752 × 7 = 5264
③ 463 × 8 = 3704

④ 378 × 4
⑤ 472 × 7
⑥ 237 × 9
⑦ 567 × 6
⑧ 763 × 5
⑨ 286 × 8
⑩ 589 × 4
⑪ 346 × 7

④	1512	⑤	3304	⑥	2133	⑦	3402
⑧	3815	⑨	2288	⑩	2356	⑪	2422

10 - 12 Multiplication Algorithm-I
3-Digit Number × 1-Digit Number (6)

Example Calculate 302 × 8 by using the algorithm.



Line up the numbers vertically in each place.

8 times 2 is 16.
Write a 6 in the ones place.
Regroup 1 into the tens place.

8 times 0 is 0.
The regrouped 1 and 0 make 1.
Write a 1 in the tens place.

8 times 3 is 24.
Write a 4 in the hundreds place.
Regroup 2 into the one thousands place.
Write a 2 in the one thousands place.

302 × 8 = 2416

Calculate the following multiplication problems by using the algorithm.

① 403 × 8 = 3224
② 608 × 7 = 4256
③ 709 × 6 = 4254

④ 207 × 5
⑤ 308 × 4
⑥ 506 × 9
⑦ 807 × 4
⑧ 209 × 8
⑨ 908 × 6
⑩ 409 × 7
⑪ 605 × 8

④	1035	⑤	1232	⑥	4554	⑦	3228
⑧	1672	⑨	5448	⑩	2863	⑪	4840

10 - 13 Multiplication Algorithm-1
Properties of Multiplication

Example Devise a way to calculate the following multiplication problem and then calculate it.

75 × 5 × 2 = 75 × (5 × 2) = 75 × 10 = 750

If you calculate 5 × 2 first, it becomes 10. Then it is easier to calculate 75 × 10.

When you multiply 3 numbers, whether you start by calculating the first 2 numbers or the last 2 numbers, the answer is the same.

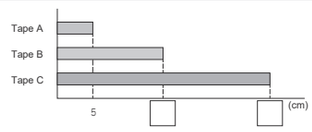
Devise a way to calculate the following multiplication problems and then calculate them.

1. 90 × 3 × 2 = 90 × (3 × 2) = 90 × 6 = 540
2. 80 × 3 × 3 = 80 × (3 × 3) = 80 × 9 = 720
3. 70 × 4 × 2 = 70 × (4 × 2) = 70 × 8 = 560
4. 20 × 3 × 3 = 20 × (3 × 3) = 20 × 9 = 180
5. 102 × 2 × 3 = 102 × (2 × 3) = 102 × 6 = 612
6. 125 × 2 × 5 = 125 × (2 × 5) = 125 × 10 = 1250
7. 328 × 5 × 2 = 328 × (5 × 2) = 328 × 10 = 3280

Try to find the easiest way to calculate these! You can calculate the last 2 numbers first, so it is easier to solve.

10 - 14 Multiplication Algorithm-1
Calculation with Times as Much

Example There are 3 tapes. The length of tape A is 5 cm. The length of tape B is 3 times as long as tape A. The length of tape C is 2 times as long as tape B. How long are tapes B and C ?



Calculate the length of tape B.
5 × 3 = 15 Tape B is 15 cm
Calculate the length of tape C.
15 × 2 = 30 Tape C is 30 cm

Answer Tape B 15 cm Tape C 30 cm

1 There are 3 ropes. The length of rope A is 80 cm. The length of rope B is 3 times as long as rope A. The length of rope C is 2 times as long as rope B. How long are ropes B and C?

The length of rope B: 80 × 3 = 240
The length of rope C: 240 × 2 = 480

Answer Rope B 240 cm Rope C 480 cm

2 There are 3 boxes with oranges. There are 20 oranges in box A. The number of oranges in box B is 2 times as many as box A. The number of oranges in box C is 3 times as many as box B. How many oranges are there in boxes B and C?

Oranges in box B: 20 × 2 = 40
Oranges in box C: 40 × 3 = 120

Answer 40 oranges in box B, 120 oranges in box C

10 - 15 Multiplication Algorithm-1
Review

1 Calculate these multiplication problems by using the algorithm.

1. 41 × 2 = 82
2. 12 × 3 = 36
3. 21 × 2 = 42
4. 25 × 3 = 75
5. 38 × 2 = 76
6. 16 × 4 = 64
7. 74 × 2 = 148
8. 93 × 3 = 279

2 Calculate these multiplication problems by using the algorithm.

1. 56 × 6 = 336
2. 39 × 5 = 195
3. 69 × 8 = 552
4. 78 × 8 = 624
5. 68 × 3 = 204
6. 26 × 4 = 104
7. 36 × 3 = 108
8. 25 × 4 = 100

3 Calculate these multiplication problems by using the algorithm.

1. 243 × 2 = 486
2. 261 × 3 = 783
3. 231 × 4 = 924
4. 142 × 6 = 852
5. 173 × 5 = 865
6. 753 × 7 = 5271
7. 309 × 8 = 2472

4 Devise a way to calculate the following multiplication problems and then calculate them.

1. 90 × 4 × 2 = 90 × (4 × 2) = 90 × 8 = 720
2. 60 × 3 × 3 = 60 × (3 × 3) = 60 × 9 = 540
3. 253 × 2 × 5 = 253 × (2 × 5) = 253 × 10 = 2530
4. 87 × 5 × 2 = 87 × (5 × 2) = 87 × 10 = 870

5 There are 3 wooden sticks. The length of stick A is 60 cm. The length of stick B is 3 times as long as stick A. The length of stick C is 2 times as long as stick B. How long are sticks B and C?

The length of stick B: 60 × 3 = 180
The length of stick C: 180 × 2 = 360

Answer stick B 180 cm stick C 360 cm

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11 - 1 Weight
How to Read a Scale

Instruction Let's measure the weight of an object using a scale.

1. Put the scale on a flat surface.	2. At first, make sure the needle is at "0".	3. Stand directly in front of scale when reading it.
	 Check it	 Scale showing the weight

- A unit called **gram** is used to measure weight.
- 1 gram is written as 1 **g**.

The weight of a one-yen coin is 1 g. Look for objects that weigh 1 g around you.

Example 1

1. Up to how many g can the scale on the right weigh?
   1000 g
   
2. How many g does one mark on the scale represent?
   10 g
3. Read the following scales and write the weight in the ☐.
   A  500 g
   B  160 g
4. Draw the needle showing the following weights on the scale.
   C 250 g 
   D 870 g 

1. Read the scales and write the weight in the ☐.
   1.  100 g
   2.  350 g
   3.  180 g
   4.  670 g
   5.  790 g
   6.  910 g
2. Draw the needle on the scale to show the following weights.
   1. 600 g 
   2. 750 g 
   3. 90 g 
   4. 130 g 
   5. 370 g 
   6. 410 g 

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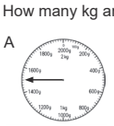
11 - 2 Weight
Units of Weight (1)

Instruction Let's measure weight of an object using a scale.

- 1000 g is called 1 **kilogram** and is written as 1 **kg**.
- 1 kg = 1000 g.

1 L of water weighs 1 kg.

Example 1

1. Up to how many kg can the scale on the right weigh?
   2 kg
   
2. How many g does the smallest mark on the scale represent?
   20 g
3. How many kg and g does scale A and scaleB show?
   A  1 kg 500 g
   B  1 kg 320 g

How many kg and g does each scale show?

1.  1 kg 200 g
2.  1 kg 740 g

11 - 3 Weight
Units of Weight (2)

Example 1 Convert the weights.

2050 g = 2 kg 50 g

1000 g is same as 1 kilogram and it can be written as 1 kg.

Example 2 Convert the weights to g or kg.

1. 3 kg = 3000 g
2. 1 kg 600 g = 1600 g

This is a tip for conversion.
If you convert 1600 g, copy the numbers as it is. → 1 kg 600 g

Convert the weights to g or kg or kg and g. ☐☐☐ kg ☐☐☐ g

1. 1000 g = 1 kg
2. 9000 g = 9 kg
3. 1500 g = 1 kg 500 g
4. 3260 g = 3 kg 260 g
5. 4220 g = 4 kg 220 g
6. 5300 g = 5 kg 300 g
7. 1 kg 700g = 1700 g
8. 3 kg 400 g = 3400 g
9. 2 kg 78 g = 2078 g
10. 1 kg 25 g = 1025 g
11. 8 kg 3 g = 8003 g
12. 9 kg 5 g = 9005 g
13. 7 kg 275 g = 7275 g
14. 10 kg = 10000 g

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11 - 4 Weight — Relation between Units

Example 1 Fill in the ☐ with numbers.

1. 1 m = 1000 mm
2. 1 L = 1000 mL

Example 2 Fill in the ☐ with appropriate units of quantities.

1. Width of a notebook. — 21 cm
2. Amount of milk in a milk carton. — 1 L
3. Weight of a child. — 30 kg

1 Fill in the ☐ with numbers.

1. 1 km = 1000 m
2. 1 kg = 1000 g

2 Fill in the ☐ with appropriate units of quantities.

1. Length of a classroom. — 8 m
2. Distance of a hiking trail. — 10 km
3. Amount of canned juice. — 350 mL
4. Thickness of a notebook. — 4 mm
5. Weight of a tennis ball. — 58 g

11 - 5 Weight — Units of Weight (3)

Example 1 A small car weighs 1000 kg and a truck weighs 3100 kg. How much is the total weight?

1000 kg + 3100 kg = 4100 kg

1000 kg is called 1 **tonne** and written as 1 **t**.
1 t = 1000 kg

Example 2 Convert the weights to kg or t.

1. 7000 kg = 7 t
2. 4 t 600 kg = 4600 kg

This is a tip for conversion.
□□4 600 kg
4600 kg

1 A baby elephant at a zoo weighs 1400 kg, and the mother elephant weighs 4600 kg. What is their weight in total?

1400 kg + 4600 kg = 6000 kg = 6 t

2 Convert the weights to kg or t or t and kg. □□□ t □□□ kg

1. 1000 kg = 1 t
2. 5000 kg = 5 t
3. 2500 kg = 2 t 500 kg
4. 1160 kg = 1 t 160 kg
5. 3095 kg = 3 t 95 kg
6. 4475 kg = 4 t 475 kg
7. 1 t 700 kg = 1700 kg
8. 3 t 450 g = 3450 kg
9. 5 t 95 kg = 5095 kg
10. 10 t = 10000 kg

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11 - 6 Weight — Review

1 What is the highest weight this scale and measure? What is the lowest? Fill in the table below.

Scale		
Highest weight	1 kg (1000 g)	2 kg (2000 g)
Lowest weight	10 g	20 g

2 Read the scales.

1.  900 g
2.  300 g
3.  1 kg 260 g
4.  1 kg 340 g

3 Draw the needle to show the following weights on the scale.

1. 80 g 
2. 1760 g 

4 Convert the weights to g or kg or kg and g.

1. 1000 g = 1 kg
2. 1000 kg = 1 t
3. 3790 g = 3 kg 790 g
4. 2230 kg = 2 t 230 kg
5. 1 t 450kg = 1450 kg
6. 5 kg 50 g = 5050 g

□□□ t □□□ kg □□□ g

5 Complete the table below.

Kinds of Units	m	c	d		K
Length	1000 mm	100 cm		1 m	
Capacity	1000 mL		10 dL	1 L	
Weight				1000 g	1 kg

6 Fill in the ☐ with appropriate units of quantities.

1. Weight of a truck. — 3 t
2. Height of a can. — 10 cm
3. Amount of soda in a PET bottle. — 500 mL
4. Weight of 1 L of bottled water. — 1 kg
5. Length of a staple. — 10 mm

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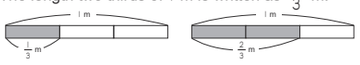
12 - 1 Fractions
Expressing the Size of Divided Parts (1)

Instruction When 1 m is divided into 3 equal parts, one of the parts is called **one-third** of 1 m.

Numerator: the length of 2 parts
$\frac{2}{3}$ m
Denominator: Dividing 1 m into 3 parts

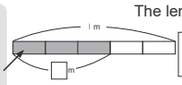
The length one third of 1 m is written as $\frac{1}{3}$ m.
Two of the parts together is called **two-thirds** of 1 m.
The length two thirds of 1 m is written as $\frac{2}{3}$ m.



Example 1 How many ▭ is the length of the coloured part? How many metres is the coloured part?

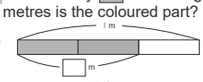
1 m is divided into 5 parts equally. This is the size of 1 **measurement mark**.

The length of the coloured parts is

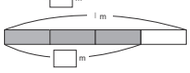


3 ▭ s and $\frac{3}{5}$ m

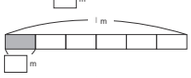
1 How many ▭ is the length of the coloured part? How many metres is the coloured part?

1 

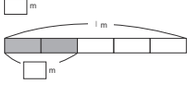
The length of the coloured part is 2 ▭ s and $\frac{2}{3}$ m

2 

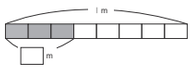
The length of the coloured part is 3 ▭ s and $\frac{3}{4}$ m

3 

The length of the coloured part is 1 ▭ s and $\frac{1}{6}$ m

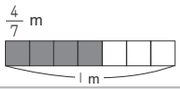
4 

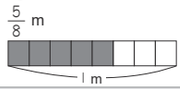
The length of the coloured part is 2 ▭ s and $\frac{2}{5}$ m

5 

The length of the coloured part is 3 ▭ s and $\frac{3}{8}$ m

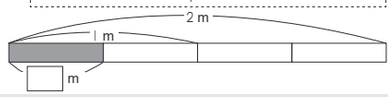
2 Colour the parts expressing the lengths shown below.

1 $\frac{4}{7}$ m 

2 $\frac{5}{8}$ m 

Example 2 The following shows a problem and Student A's answer. Is his answer correct?

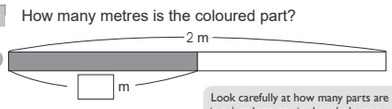
Question: How many metres is the coloured part?
Student A's answer: $\frac{1}{4}$ m



Student A's answer is incorrect.
The coloured part is a $\frac{1}{4}$ of the whole. Now the whole is 2 m, not 1 m. Therefore, the coloured part is $\frac{1}{4}$ of 2 m, which equals to $\frac{1}{2}$ m. The correct answer is $\frac{1}{2}$ m.

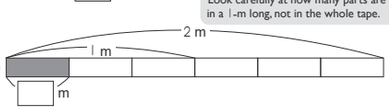
We must think about how many parts are there in a 1 m long tape. In the above example, there are 2 parts in a 1 m long tape.

3 How many metres is the coloured part?

1 

1 m

Look carefully at how many parts are there in a 1-m long, not in the whole tape.

2 

$\frac{1}{3}$ m

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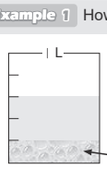
12 - 2 Fractions
Expressing the Size of Divided Parts (2)

Example 1 How many litres of water is shown in the picture?



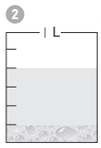
The coloured parts is 3 ▭ s.
The answer is $\frac{3}{5}$ L.

Think about how many equally divided parts of 1 L of water there are. This is the size of **1 measurement mark.**

1 How many measurement marks are shown in the picture? Then answer how many litres of water there are.

1 

There are 2 measurement marks and $\frac{2}{5}$ L

2 

There are 4 measurement marks and $\frac{4}{6}$ L

3 

There are 1 measurement marks and $\frac{1}{3}$ L

4 

There are 5 measurement marks and $\frac{5}{8}$ L

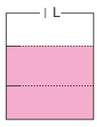
5 

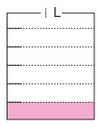
There are 3 measurement marks and $\frac{3}{7}$ L

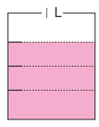
6 

There are 2 measurement marks and $\frac{2}{4}$ L

2 Colour in the following amounts of water.

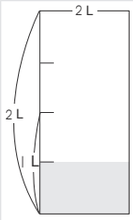
1 $\frac{2}{3}$ L 

2 $\frac{1}{6}$ L 

3 $\frac{3}{4}$ L 

4 $\frac{3}{8}$ L 

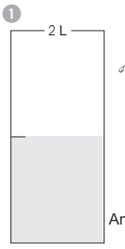
Example 2 How many litres of water is shown in the picture?



The coloured part (▭) is a $\frac{1}{4}$ of the whole. However, the whole is 2 L, not 1 L.
Therefore, the colored part is $\frac{1}{4}$ of 2 L, which equals to $\frac{1}{2}$ L.
Answer $\frac{1}{2}$ L

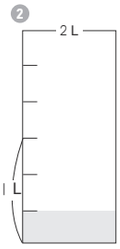
As learnt in the previous section, we must think about how many parts are there in a 1 L. In the above example, there are 2 parts in a 1 L.

3 How many litres of water is there in the following containers?

1 

Look carefully at how many parts are there in a 1 L, not in the whole container.

Answer 1 L

2 

Answer $\frac{1}{3}$ L

12 - 3 Fractions — Expressing the Size of Fractions (1)

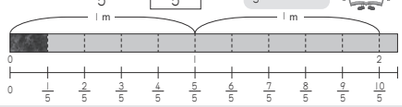
Example Look at the following number line. How many meters are two, three, four, five and six $\frac{1}{5}$ m?

Two $\frac{1}{5}$ m is $\frac{2}{5}$ m. Three $\frac{1}{5}$ m is $\frac{3}{5}$ m.

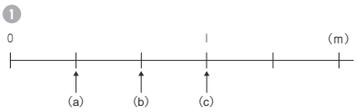
Four $\frac{1}{5}$ m is $\frac{4}{5}$ m. Five $\frac{1}{5}$ m is $\frac{5}{5}$ m.

Six $\frac{1}{5}$ m is $\frac{6}{5}$ m.

$\frac{5}{5}$ m = 1 m



What are the lengths represented by tick marks (a) to (i).

1 

(a) $\frac{1}{3}$ m (b) $\frac{2}{3}$ m (c) $\frac{3}{3}$ or 1 m

2 

(d) $\frac{1}{6}$ m (e) $\frac{3}{6}$ m (f) $\frac{7}{6}$ m

3 

(g) $\frac{1}{4}$ m (h) $\frac{4}{4}$ or 1 m (i) $\frac{6}{4}$ m

12 - 4 Fractions — Expressing the Size of Fractions (2)

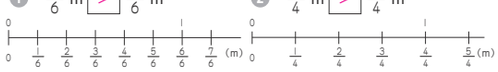
Example 1 Which is greater? Write the appropriate sign (< or >) in the □.

$\frac{4}{5}$ m > $\frac{3}{5}$ m

$\frac{4}{5}$ is four $\frac{1}{5}$ and $\frac{3}{5}$ is three $\frac{1}{5}$.

1 Which is greater? Write the appropriate sign (< or >) in the □.

1 $\frac{5}{6}$ m > $\frac{3}{6}$ m 2 $\frac{2}{4}$ m > $\frac{1}{4}$ m

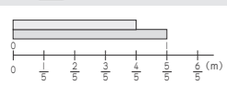


3 $\frac{1}{3}$ m < $\frac{2}{3}$ m 4 $\frac{1}{8}$ m < $\frac{5}{8}$ m 5 $\frac{3}{10}$ m < $\frac{7}{10}$ m

6 $\frac{5}{6}$ m > $\frac{4}{6}$ m 7 1 m > $\frac{1}{9}$ m 8 $\frac{2}{7}$ m < $\frac{5}{7}$ m

Example 2 Write the fraction in the □.

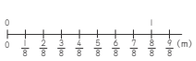
$\frac{4}{5}$ m is $\frac{1}{5}$ m smaller than 1 m.



2 Write the fractions in the □.

1 $\frac{7}{8}$ m is $\frac{1}{8}$ m smaller than 1 m.

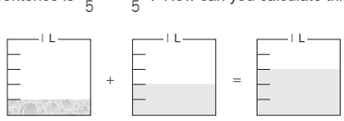
2 $\frac{5}{8}$ m is $\frac{3}{8}$ m larger than $\frac{2}{8}$ m.



12 - 5 Fractions — Addition

Example There is $\frac{1}{5}$ L of juice in a carton and $\frac{2}{5}$ L in another carton. How much juice is there altogether?

Math sentence is $\frac{1}{5} + \frac{2}{5}$. How can you calculate this?



One $\frac{1}{5}$ L Two $\frac{1}{5}$ L Three $\frac{1}{5}$ L

So, $\frac{1}{5} + \frac{2}{5} = \frac{3}{5}$ Answer $\frac{3}{5}$ L

1 There is $\frac{1}{7}$ L of milk in a carton and $\frac{2}{7}$ L in another carton. How much milk is there altogether?

Math Sentence $\frac{1}{7} + \frac{2}{7} = \frac{3}{7}$ Answer $\frac{3}{7}$ L

Since the denominators are the same, we can calculate only the numerators.

2 Calculate the following addition problems.

1 $\frac{1}{5} + \frac{3}{5} = \frac{4}{5}$ 2 $\frac{3}{7} + \frac{2}{7} = \frac{5}{7}$ 3 $\frac{3}{9} + \frac{4}{9} = \frac{7}{9}$

4 $\frac{1}{8} + \frac{2}{8} = \frac{3}{8}$ 5 $\frac{2}{6} + \frac{3}{6} = \frac{5}{6}$ 6 $\frac{2}{3} + \frac{1}{3} = \frac{3}{3} = 1$

12 - 6 Fractions — Subtraction (1)

Example There is $\frac{3}{5}$ L of juice in a carton. If a boy drinks $\frac{1}{5}$ L of juice, how much juice will be left?

Math sentence is $\frac{3}{5} - \frac{1}{5}$. How can you calculate this?

Three $\frac{1}{5}$ L One $\frac{1}{5}$ L Two $\frac{1}{5}$ L

So, $\frac{3}{5} - \frac{1}{5} = \frac{2}{5}$ Answer $\frac{2}{5}$ L

1 There is $\frac{4}{7}$ L of milk in a carton. When a girl drinks $\frac{1}{7}$ L of milk, how much milk will be left?

Math Sentence $\frac{4}{7} - \frac{1}{7} = \frac{3}{7}$ Answer $\frac{3}{7}$ L

Since the denominators are the same, we can calculate only the numerators.

2 Calculate the following addition problems.

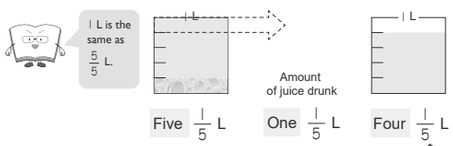
1 $\frac{8}{9} - \frac{4}{9} = \frac{4}{9}$ 2 $\frac{2}{3} - \frac{1}{3} = \frac{1}{3}$ 3 $\frac{7}{8} - \frac{6}{8} = \frac{1}{8}$

4 $\frac{4}{5} - \frac{2}{5} = \frac{2}{5}$ 5 $\frac{5}{6} - \frac{4}{6} = \frac{1}{6}$ 6 $\frac{6}{7} - \frac{3}{7} = \frac{3}{7}$

12 - 7 Fractions
Subtraction (2)

Example There is 1 L of juice in a carton. If a girl drinks $\frac{1}{5}$ L of juice, how much juice will be left?

Math sentence is $1 - \frac{1}{5}$. How can you calculate this?



Five $\frac{1}{5}$ L One $\frac{1}{5}$ L Four $\frac{1}{5}$ L

So, $1 - \frac{1}{5} = \frac{5}{5} - \frac{1}{5} = \frac{4}{5}$ Answer $\frac{4}{5}$ L

1 There is 1 L of milk in a carton. When a child drinks $\frac{1}{5}$ L of milk, how much milk will be left?

1 L is seven $\frac{1}{7}$ L.
Therefore, 1 L is the same as $\frac{7}{7}$ L.

Math Sentence $1 - \frac{1}{7} = \frac{7}{7} - \frac{1}{7} = \frac{6}{7}$ Answer $\frac{6}{7}$ L

2 Calculate the following addition problems.

① $1 - \frac{3}{4} = \frac{1}{4}$ ② $1 - \frac{1}{3} = \frac{2}{3}$ ③ $1 - \frac{5}{8} = \frac{3}{8}$

④ $1 - \frac{2}{9} = \frac{7}{9}$ ⑤ $1 - \frac{3}{7} = \frac{4}{7}$ ⑥ $1 - \frac{3}{5} = \frac{2}{5}$

In this case, 1 L is nine $\frac{1}{9}$ L. Therefore, 1 L is the same as $\frac{9}{9}$ L.

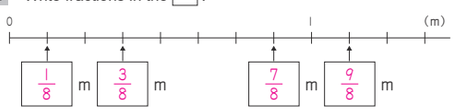
12 - 8 Fractions
Review

1 Use fractions to express different lengths and different amounts of water as shown by the coloured parts.

① 1 m $\frac{1}{4}$ m ② 1 m $\frac{2}{5}$ m

③ 1 L $\frac{2}{3}$ L ④ 1 L $\frac{5}{6}$ L ⑤ 1 L $\frac{3}{7}$ L

2 Write fractions in the □.



3 Which is greater? Write the appropriate sign (< or >) in the □.

① $\frac{2}{5}$ m < $\frac{3}{5}$ m ② $\frac{5}{8}$ m > $\frac{3}{8}$ m ③ $\frac{6}{7}$ m < 1

4 Calculate the following.

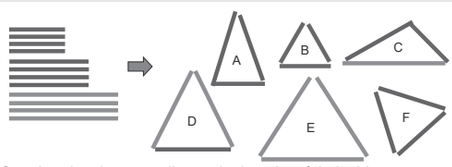
① $\frac{1}{5} + \frac{1}{5} = \frac{2}{5}$ ② $\frac{2}{7} + \frac{3}{7} = \frac{5}{7}$ ③ $\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$

④ $\frac{4}{8} - \frac{3}{8} = \frac{1}{8}$ ⑤ $\frac{4}{9} - \frac{2}{9} = \frac{2}{9}$ ⑥ $\frac{5}{6} - \frac{2}{6} = \frac{3}{6}$

⑦ $1 - \frac{1}{3} = \frac{2}{3}$ ⑧ $1 - \frac{3}{5} = \frac{2}{5}$ ⑨ $1 - \frac{5}{6} = \frac{1}{6}$

13 - 1 Triangles
Isosceles Triangles and Equilateral Triangles (1)

Example 1 Make various triangles using three kinds of coloured sticks.



Sort the triangles according to the lengths of their sides.

① Triangles with two sides that are the same length — A, D

② Triangles with all three sides that are the same length — B, E, F

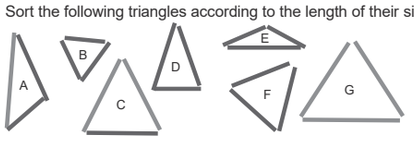
③ Triangles with all three sides that are different lengths — C

Instruction Let's classify triangles.

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

Symbols such as ⫽ indicate the sides that are the same length.

1 Sort the following triangles according to the length of their sides.

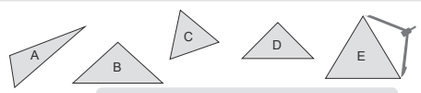


① Triangles with two sides that are the same length — C, D, E

② Triangles with all three sides that are the same length — B, F, G

③ Triangles with all three sides that are different lengths — A

Example 2 Look at the following triangles.



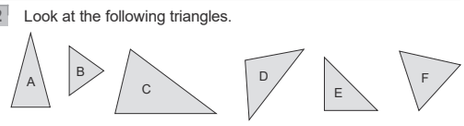
Measure the length of sides with a compass or a ruler to find isosceles and/or equilateral triangles.

① Which of these triangles are isosceles triangles? — B, D

② Which of these triangles are equilateral triangles? — C, E

A triangle like triangle D is called a **right-angled isosceles triangle**.

2 Look at the following triangles.

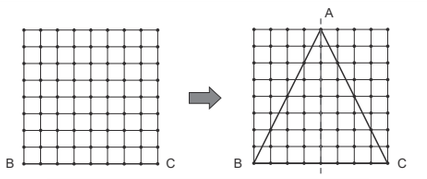


① Which of these triangles are isosceles triangles? — A, D, E

② Which of these triangles are equilateral triangles? — B, F

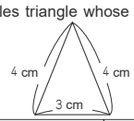
13 - 2 Triangles
Isosceles Triangles and Equilateral Triangles (2)

Instruction Draw an isosceles triangle. If the line between Point B and Point C is the base of the triangle, where would the top of the triangle be? Mark the top of the triangle as Point A and connect Points A, B, and C together with straight lines.

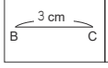


Point A is on the line that runs through the middle of line BC. Any point on that line can be the top of an isosceles triangle.

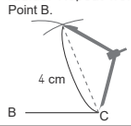
Let's draw an isosceles triangle whose sides have 3 cm, 4 cm and 4 cm.



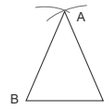
1. Draw line BC 2 cm long. This is the base of the triangle.



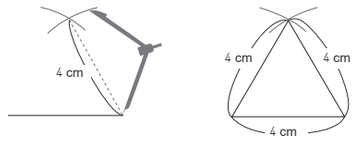
2. Using a compass, place the middle on Point C. Draw a part of a circle with a 3 cm radius. Repeat from Point B.



3. The vertex of the triangle is where these two lines cross each other. This is Point A. Draw straight lines from Point A to Point B and Point A to Point C.



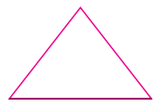
Example Draw an equilateral triangle whose sides have 4 cm using the same technique.



1 Draw isosceles triangles whose sides are the following lengths.

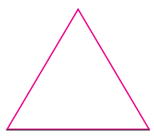
① 2 cm, 5 cm and 5 cm

② 5 cm, 4 cm and 4 cm

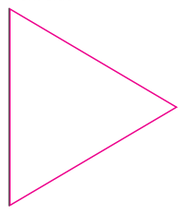


2 Draw equilateral triangles whose sides are the following lengths.

① 5 cm side



② 7 cm side



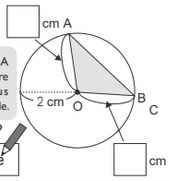
13 - 3 Triangles
Circles and Triangles

Example There is a triangle in the circle with a radius of 2 cm. Point O is the centre of the circle.

① How long is OA? 2 cm

② How long is OB? 2 cm

Both OA and OB are the radius of the circle.



③ What kind of triangle is this triangle?

Isosceles triangle

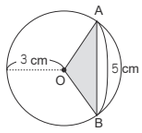
1 There is a triangle in the circle with a radius of 3 cm. Point O is the centre of the circle.

① How long is OA? 3 cm

② How long is OB? 3 cm

③ What kind of triangle is this triangle?

Isosceles triangle



2 There are two triangles in the circle with a radius of 6 cm. Point O is the centre of the circle.

① Find the length of OA. 6 cm

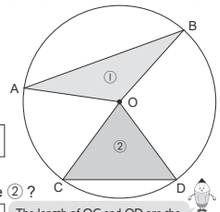
② Find the length of OB. 6 cm

③ What kind of triangle is the triangle ① ?

Isosceles triangle

④ When the length of CD is 6 cm, what kind of triangle is the triangle ② ?

Equilateral triangle

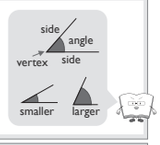


The length of OC and OD are the same as the radius of this circle.

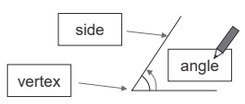
13 - 4 Triangles
Sides and Angles of Triangles

Instruction Let's look at the corners of a triangle.

- An angle is the figure formed by 2 straight lines that meet at a common point.
- This point is called the **vertex**. The two straight lines that form the angle are called the **sides**.
- The size of the opening between the two sides is called the size of the **angle**.

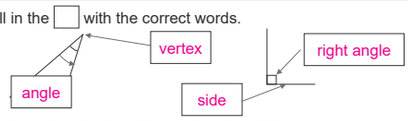


Example Fill in the ☐ with the correct words.



This angle is called a right angle.

1 Fill in the ☐ with the correct words.



2 Let's make designs by putting the following two types of triangles whose size are the same but the colour are different respectively.

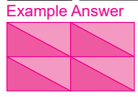
① Equilateral triangles

Example Answer

② Right-angled triangles

Let's use the given triangles.

Example Answer

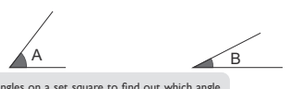


13 - 5 Triangles
Triangles and Angles (1)

Example 1 Which angle is larger?

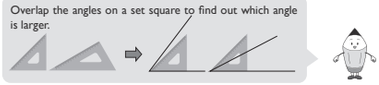
1 

B

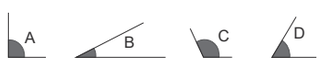
2 

A

Overlap the angles on a set square to find out which angle is larger.



Example 2 Compare the size of angles below and list them from the largest to the smallest.



C, A, D, B

1 Which angle is larger?

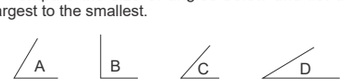
1 

A

2 

B

2 Compare the size of angles below and list them from the largest to the smallest.



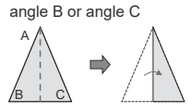
B, A, C, D

130

13 - 6 Triangles
Triangles and Angles (2)

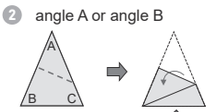
Example How to compare the size of the angles of an isosceles triangle.Cut two isosceles triangles out of paper. Fold the triangles as shown below. Lay the folded triangles on top of each other. Which angles are larger?

1 angle B or angle C



B and C are the same

2 angle A or angle B



B is larger

Fold the figures to overlap the two angles for comparison.

1 Look at the size of the angles of the equilateral triangle. Which angles is larger?

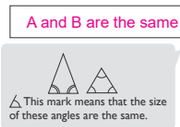
1 angle B or angle C

B and C are the same

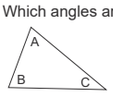
2 angle A and angle B

A and B are the same

- In an isosceles triangle, two angles are the same size.
- In an equilateral triangle, all three angles are the same size.



2 Which angles are the same?

1 

A, B

2 

A, B, C

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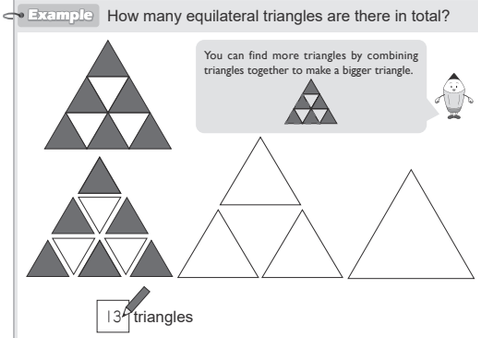
13 - 7 Triangles
How many Equilateral Triangles?

Example How many equilateral triangles are there in total?

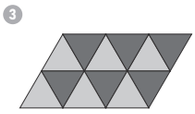


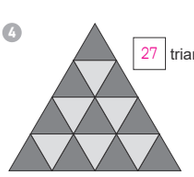
13 triangles

How many equilateral triangles are there in total?

1 
5 triangles

2 
10 triangles

3 
16 triangles

4 
27 triangles

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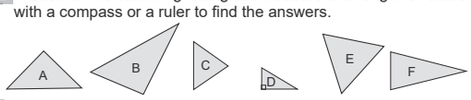
13 - 8 Triangles
Review

1 Fill in the ☐ with numbers.

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

2 An equilateral triangle has 3 sides of the same length and 3 angles of the same size.

2 Look at the following triangles. Measure the length of sides with a compass or a ruler to find the answers.



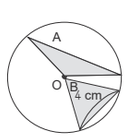
1 Which of these triangles are isosceles triangles?
A, F

2 Which of these triangles are equilateral triangles?
C, E

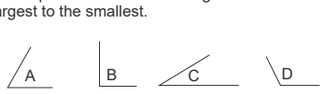
3 There are two triangles in the circle with 4 cm radius. Point O is the centre.

1 What kind of triangle is triangle A?
Isosceles triangle

2 What kind of triangle is triangle B?
Equilateral triangle



4 Compare the size of the angles below and list them from the largest to the smallest.



D, B, A, C

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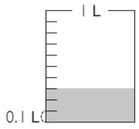
14 - 1 Decimal Numbers
How to Represent Decimal Numbers (1)

Instruction When 1 L is divided into 10 equal parts, each part is written as 0.1 L. It is read as "zero point one" litres.

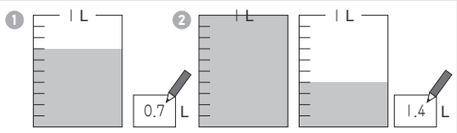


The amount of water is 3 parts of $\frac{1}{10}$.
So it is $\frac{3}{10}$ L.
This $\frac{1}{10}$ is also written as 0.1.
So, 3 parts of 0.1 is 0.3 L.

0.3 ← Decimal Point

Numbers such as 0.1 and 0.3 are called **decimal numbers**.

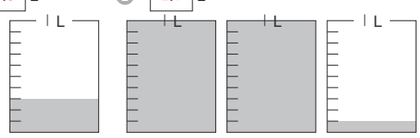
Example How many litres of water are in the containers shown below?



Think about how many 0.1 L are there? There are 7 and 14 respectively. In the case of (2), the amount of water is 1 L and 0.4 L added together. It is written as "1.4" L and is read as "one point four" litres.

How many litres of water are in the containers?

1 0.3 L 2 2.1 L



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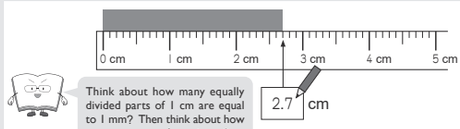
14 - 2 Decimal Numbers
How to Represent Decimal Numbers (2)

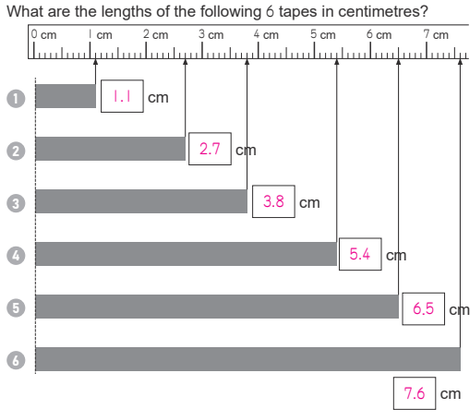
Example What is the length of the tape in centimetre (cm)?



Think about how many equally divided parts of 1 cm are equal to 1 mm? Then think about how you can express 1 mm in cm?

1 cm is divided into 10 equal parts. One part 1 mm.
So the length of the tape is 2 cm and 7 mm. 7 mm can be called 0.7 cm. So 2 cm and 0.7 cm together equal 2.7 cm.

What are the lengths of the following 6 tapes in centimetres?



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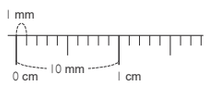
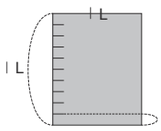
14 - 3 Decimal Numbers
How to Represent Decimal Numbers (3)

Instruction Learn the units of length and capacity.

1 cm = 10 mm



1 L = 10 dL



Example Write the numbers in the □.

1 6.1 cm = 6 cm 1 mm 2 8 L 7 dL = 8.7 L

Write the numbers in the □.

1 2.3 cm = 2 cm 3 mm 2 4.8 cm = 4 cm 8 mm
3 8.6 cm = 8 cm 6 mm 4 6.1 cm = 6 cm 1 mm
5 7.4 cm = 7 cm 4 mm 6 1.2 L = 1 L 2 dL
7 3.9 L = 3 L 9 dL 8 5.7 L = 5 L 7 dL
9 9.1 L = 9 L 1 dL 10 2.5 L = 2 L 5 dL

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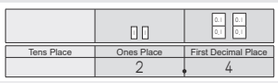
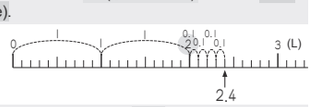
14 - 4 Decimal Numbers
Structure of Decimal Numbers

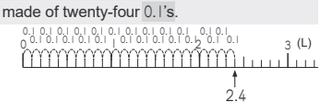
Instruction The place to the right of the decimal point is called the **first decimal place**.



The number 2.4 represents two 1's (Ones Place) and four 0.1's (First Decimal Place).



The number 2.4 is made of twenty-four 0.1's.



Example Write the numbers in the □.

1 3.4 is made of 3 1's and 4 0.1's.
2 3.4 is made of 34 0.1's.

Write the numbers in the □.

1 4.6 is made of 4 1's and 6 0.1's.
2 4.6 is made of 46 0.1's.
3 7.2 is made of seven (7) 1's and two (2) 0.1's.
4 5.8 is made of fifty-eight (58) 0.1's.

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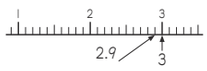
14 - 5 Decimal Numbers — Comparing Numbers

Example Which numbers is greater, 2.9 or 3?

There are three kinds of solutions for this problem.You can use one of them.
The first method is using the number line.
The second method is thinking about how many 0.1's there are in each number.
The third method is using the diagram to compare numbers.

First Method



Second Method

2.9 is made of twenty-nine (29) 0.1's.
3 is made of thirty (30) 0.1's.

Answer 2.9 < 3

Third Method

Ones Place	First Decimal Place
2	9
3	

Compare the numbers in the greatest place.

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

1. 0.4 < 0.6
2. 0.7 > 0.2
3. 4.5 < 6.1
4. 0.5 < 1.5
5. 3.4 < 4.3
6. 7.1 < 7.5
7. 1 > 0.9
8. 1.9 < 2
9. 3 < 3.1
10. 6 > 2.1
11. 8 < 8.2
12. 0 < 0.5
13. 1.3 > 0.3
14. 0.1 > 0
15. 0 < 1.2

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 > $\frac{3}{10}$

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

1. 0.8 > $\frac{7}{10}$
2. 0.5 < $\frac{6}{10}$
3. 1.2 > $\frac{11}{10}$
4. $\frac{14}{10}$ < 1.5
5. $\frac{23}{10}$ < 2.4
6. $\frac{35}{10}$ > 3.1

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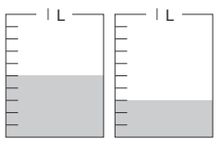
14 - 7 Decimal Numbers — Addition of Decimal Numbers (1)

Example A bottle contains 0.5 L of juice and another bottle contains 0.3 L of juice. How much juice is there altogether?



0.5 + 0.3

If we think of 0.1 L as a unit, 0.5 is made of five (5) 0.1's, and 0.3 is made of three (3) 0.1's.
There are eight (8) 0.1's altogether.

Math Sentence 0.5 + 0.3 = 0.8

Answer 0.8 L

1 A container has 0.4 L of milk and another container has 0.3 L of milk. How much milk is there altogether?

Math Sentence 0.4 + 0.3 = 0.7

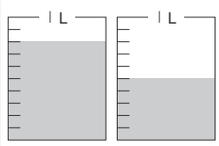
Answer 0.7 L

2 Calculate the following addition problems.

1. 0.4 + 0.2 = 0.6
2. 0.2 + 0.7 = 0.9
3. 0.6 + 0.1 = 0.7
4. 0.3 + 0.5 = 0.8
5. 0.1 + 0.5 = 0.6
6. 0.8 + 0.1 = 0.9
7. 0.5 + 0.4 = 0.9
8. 0.3 + 0.5 = 0.8
9. 0.3 + 0.6 = 0.9
10. 0.5 + 0.2 = 0.7
11. 0.2 + 0.2 = 0.4
12. 0.4 + 0.4 = 0.8

14 - 8 Decimal Numbers — Addition of Decimal Numbers (2)

Example A bottle contains 0.8 L of juice and another bottle contains 0.5 L of juice. How much juice is there altogether?



0.8 + 0.5

If we think of 0.1 L as a unit, 0.8 is made of eight (8) 0.1's, and 0.5 is made of five (5) 0.1's. There are thirteen (13) 0.1's altogether. 10 is regrouped to the ones place. So it becomes 1.3.

Math Sentence 0.8 + 0.5 = 1.3

Answer 1.3 L

1 A container has 0.9 L of milk and another container has 0.6 L of milk. How much milk is there altogether?

Math Sentence 0.9 + 0.6 = 1.5

Answer 1.5 L

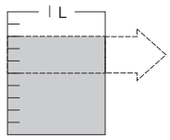
2 Calculate the following addition problems.

You do not have to write "0," when the answer is "1.0."

1. 0.8 + 0.3 = 1.1
2. 0.7 + 0.5 = 1.2
3. 0.9 + 0.6 = 1.5
4. 0.4 + 0.7 = 1.1
5. 0.6 + 0.6 = 1.2
6. 0.8 + 0.9 = 1.7
7. 0.7 + 0.5 = 1.2
8. 0.2 + 0.8 = 1.0 or 1
9. 0.5 + 0.5 = 1.0 or 1
10. 1 + 0.2 = 1.2
11. 1 + 0.9 = 1.9
12. 0.4 + 1 = 1.4

14 - 9 Decimal Numbers
Subtraction of Decimal Numbers (1)

Example There are 0.8 L of juice. A boy drank 0.3 L of it. How many litres of juice are left?



0.8 − 0.3

If we think of 0.1 L as a unit, 0.8 is made of eight (8) 0.1's, and 0.3 is made of three (3) 0.1's.

There are five (5) 0.1's left.

Math Sentence: 0.8 − 0.3 = 0.5 Answer: 0.5 L

1 There are 0.7 L of milk. A girl drank 0.4 L of it. How many litres of milk are left?

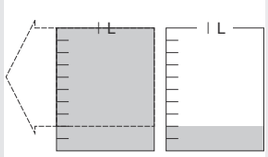
Math Sentence: 0.7 − 0.4 = 0.3 Answer: 0.3 L

2 Calculate the following subtraction problems.

① 0.5 − 0.2 = 0.3	② 0.7 − 0.2 = 0.5
③ 0.6 − 0.4 = 0.2	④ 0.5 − 0.4 = 0.1
⑤ 0.8 − 0.1 = 0.7	⑥ 0.4 − 0.3 = 0.1
⑦ 0.5 − 0.4 = 0.1	⑧ 0.5 − 0.3 = 0.2
⑨ 0.6 − 0.3 = 0.3	⑩ 0.9 − 0.8 = 0.1
⑪ 0.8 − 0.1 = 0.7	⑫ 0.4 − 0.2 = 0.2

14 - 10 Decimal Numbers
Subtraction of Decimal Numbers (2)

Example There are 1.2 L of juice. A child drank 0.8 L of it. How many litres of juice are left?



1.2 − 0.8

If we think of 0.1 L as a unit, 1.2 is made of twelve (12) 0.1's, and 0.8 is made of eight (8) 0.1's.

There are four (4) 0.1's left So, it becomes 0.4.

Math Sentence: 1.2 − 0.8 = 0.4 Answer: 0.4 L

1 There are 1.5 L of orange juice. My mother drank 0.6 L of it. How many litres of orange juice are left?

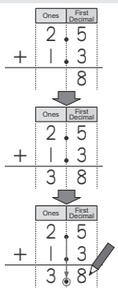
Math Sentence: 1.5 − 0.6 = 0.9 Answer: 0.9 L

2 Calculate the following addition problems.

① 1.4 − 0.5 = 0.9	② 1.2 − 0.8 = 0.4
③ 1.3 − 0.6 = 0.7	④ 1.1 − 0.7 = 0.4
⑤ 1.6 − 0.9 = 0.7	⑥ 1.3 − 0.4 = 0.9
⑦ 1.5 − 0.5 = 1.0 or 1	⑧ 1.7 − 0.9 = 0.8
⑨ 1 − 0.9 = 0.1	⑩ 1 − 0.2 = 0.8
⑪ 1 − 0.1 = 0.9	⑫ 1 − 0.6 = 0.4

14 - 11 Decimal Numbers
Addition Algorithm (1)

Example Calculate 2.5 + 1.3 by using the algorithm.



Line up the numbers vertically in each place.

Calculate each place separately.

First Decimal Place

5 + 3 = 8

Ones Place

2 + 1 = 3

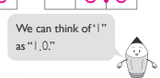
Line up the decimal points from the top and place the decimal point in the answer.

2.5 + 1.3 = 3.8

Calculate the following addition problems by using the algorithm.

① 2.5 + 1.4 ② 1.2 + 3.6 ③ 4.1 + 2.2 ④ 3.4 + 5.1

2.5 + 1.4 = 3.9	1.2 + 3.6 = 4.8	4.1 + 2.2 = 6.3	3.4 + 5.1 = 8.5

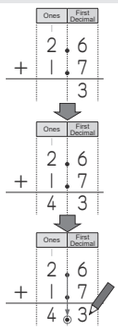


⑤ 0.3 + 0.6 ⑥ 1.5 + 0.3 ⑦ 0.7 + 5.2 ⑧ 6.3 + 1.2
⑨ 0.5 + 1.3 ⑩ 0.4 + 0.5 ⑪ 1 + 7.1 ⑫ 1 + 0.8

⑤ 0.9	⑥ 1.8	⑦ 5.9	⑧ 7.5
⑨ 1.8	⑩ 0.9	⑪ 8.1	⑫ 1.8

14 - 12 Decimal Numbers
Addition Algorithm (2)

Example Calculate 2.6 + 1.7 by using the algorithm.



Line up the numbers vertically in each place.

Calculate each place separately.

First Decimal Place

5 + 3 = 13

Regroup 1 to the ones place.

Ones Place

The regrouped 1 and 2 make 3.

3 + 1 = 4

Line up the decimal points from the top and place the decimal point in the answer.

2.6 + 1.7 = 4.3

Calculate the following addition problems by using the algorithm.

① 2.7 + 1.6 ② 6.5 + 2.9 ③ 3.9 + 1.5 ④ 7.6 + 1.7

2.7 + 1.6 = 4.3	6.5 + 2.9 = 9.4	3.9 + 1.5 = 5.4	7.6 + 1.7 = 9.3

⑤ 8.9 + 0.6 ⑥ 0.8 + 7.4 ⑦ 0.7 + 0.5 ⑧ 2.9 + 3.3
⑨ 0.9 + 1.8 ⑩ 4.5 + 0.9 ⑪ 2.4 + 1.7 ⑫ 5.3 + 1.8

⑤ 9.5	⑥ 8.2	⑦ 1.2	⑧ 6.2
⑨ 2.7	⑩ 5.4	⑪ 4.1	⑫ 7.1

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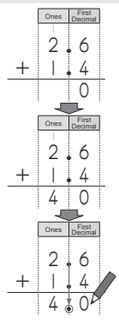
14 - 13 Decimal Numbers
Addition Algorithm (3)

Example Calculate 2.6 + 1.4 by using the algorithm.



Line up the numbers vertically in each place.

Calculate each place separately.

First Decimal Place

6 + 4 = 10

Write a 0 in the first decimal place.
Regroup 1 to the ones place.

Ones Place

The regrouped 1 and 2 make 3.

3 + 1 = 4

Line up the decimal points from the top and place the decimal point in the answer.

2.6 + 1.4 = 4.0

In this case, it is fine that the answer is "4".

Calculate the following addition problems by using the algorithm.

1. 2.7 + 1.3
2. 5.5 + 3.5
3. 3.9 + 1.1
4. 4.6 + 1.4

2.7 + 1.3 4.0	5.5 + 3.5 9.0	3.9 + 1.1 5.0	4.6 + 1.4 6.0

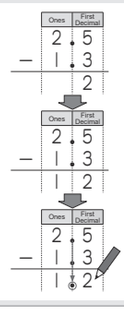
5. 8.9 + 0.1
6. 0.8 + 4.2
7. 0.7 + 0.3
8. 0.2 + 1.8
9. 0.4 + 0.6
10. 3.5 + 2.5
11. 5.6 + 2.4
12. 1.6 + 1.4

When the answer is "2.0," we can also write "2" as the answer.

5	9.0 or 9	6	5.0 or 5	7	1.0 or 1	8	2.0 or 2
9	1.0 or 1	10	6.0 or 6	11	8.0 or 8	12	3.0 or 3

14 - 14 Decimal Numbers
Subtraction Algorithm (1)

Example Calculate 2.5 − 1.3 by using the algorithm.



Line up the numbers vertically in each place.

Calculate each place separately.

First Decimal Place

5 − 3 = 2

Ones Place

2 − 1 = 1

Line up the decimal points from the top and place the decimal point in the answer.

2.5 − 1.3 = 1.2

Calculate the following subtraction problems by using the algorithm.

1. 2.5 − 1.4
2. 3.6 − 1.2
3. 4.3 − 2.2
4. 5.4 − 3.1

2.5 − 1.4 1.1	3.6 − 1.2 2.4	4.3 − 2.2 2.1	5.4 − 3.1 2.3

5. 3.5 − 0.3
6. 1.5 − 0.2
7. 5.7 − 4.2
8. 6.3 − 4.1
9. 1.8 − 0.7
10. 4.6 − 3.6
11. 1.6 − 1.2
12. 7.2 − 7.1

Pay attention to the problem (10). In addition, don't forget to write "0" in the ones place in the roblems (11) and (12).

5	3.2	6	1.3	7	1.5	8	2.2
9	1.1	10	1.0 or 1	11	0.4	12	0.1

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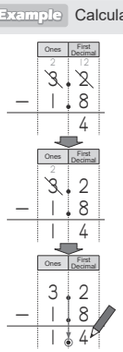
14 - 15 Decimal Numbers
Subtraction Algorithm (2)

Example Calculate 3.2 − 1.8 by using the algorithm.



Line up the numbers vertically in each place.

Calculate each place separately.

First Decimal Place

You can't take 8 from 2 so you need to regroup from the ones place.

12 − 8 = 4

Ones Place

Since you regrouped, the ones place becomes 2.

2 − 1 = 1

Line up the decimal points from the top and place the decimal point in the answer.

3.2 − 1.8 = 1.4

Calculate the following subtraction problems by using the algorithm.

1. 4.2 − 1.8
2. 3.4 − 1.9
3. 5.3 − 2.7
4. 5.4 − 3.6

4.2 − 1.8 2.4	3.4 − 1.9 1.5	5.3 − 2.7 2.6	5.4 − 3.6 1.8

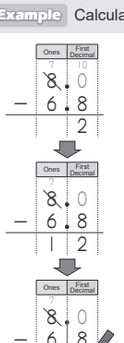
5. 3.6 − 0.7
6. 2.6 − 0.8
7. 5.1 − 3.2
8. 6.2 − 5.5
9. 7.4 − 6.6
10. 4.6 − 3.7
11. 2.1 − 1.9
12. 8.3 − 5.7

Regarding the problems (8), (9), (10) and (11), don't forget to write "0" in the ones place.

5	2.9	6	1.8	7	1.9	8	0.7
9	0.8	10	0.9	11	0.2	12	2.6

14 - 16 Decimal Numbers
Subtraction Algorithm (3)

Example Calculate 8 − 6.8 by using the algorithm.



Line up the numbers vertically in each place. You can consider 8 as 8.0. Write a 0 in the first decimal place.

Calculate each place separately.

First Decimal Place

You can't take 8 from 0 so you need to regroup from the ones place.

10 − 8 = 2

Ones Place

Since you regrouped, the ones place becomes 7.

7 − 6 = 1

Line up the decimal points from the top and place the decimal point in the answer.

8 − 6.8 = 1.2

Think of "8" as "8.0." "8" is written in the ones place.

Calculate the following subtraction problems by using the algorithm.

1. 8 − 4.8
2. 7 − 1.9
3. 5 − 2.7
4. 6 − 3.6

8 − 4.8 3.2	7 − 1.9 5.1	5 − 2.7 2.3	6 − 3.6 2.4

5. 2 − 0.7
6. 3 − 0.8
7. 4 − 2.9
8. 5 − 4.5
9. 1 − 0.1
10. 9 − 7.2
11. 2 − 1.8
12. 6 − 5.6

5	1.3	6	2.2	7	1.1	8	0.5
9	0.9	10	1.8	11	0.2	12	0.4

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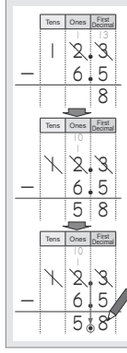
14 - 17 Decimal Numbers — Subtraction Algorithm (4)

Example Calculate 12.3 − 6.5 by using the algorithm.



Line up the numbers vertically in each place.

Calculate each place separately.

First Decimal Place

You can't take 5 from 3, so you need to regroup from the ones place.

13 − 5 = 8

Ones Place

Since you regrouped, the ones place becomes 1. You can't take 6 from 1, so you need to regroup from the tens place.

11 − 6 = 5

Tens Place

Since you regrouped, the tens place becomes 0.

Line up the decimal points from the top and place the decimal point in the answer.

12.3 − 6.5 = 5.8

Calculate the following subtraction problems by using the algorithm.

1 12.4 − 5.6 2 15.8 − 7.9 3 13.2 − 6.6 4 17.1 − 8.3

	12.4		15.8		13.2		17.1
−	5.6	−	7.9	−	6.6	−	8.3
	6.8		7.9		6.6		8.8

5 25.3 − 7.5 6 36.3 − 5.9 7 42.3 − 9.7 8 50.3 − 4.8

9 10 − 8.1 10 20 − 2.5 11 43 − 14.3 12 56 − 15.6

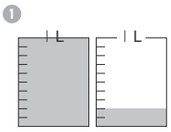
Think of "10," "20," "43" and "56" as "10.0," "20.0," "43.0" and "56.0," respectively.

5	17.8	6	30.4	7	32.6	8	45.5
9	1.9	10	17.5	11	28.7	12	40.4

14 - 18 Decimal Numbers — Review

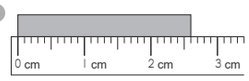
1 What is the length of the tape and what is the amount of the water? Write the numbers in the ☐.

1



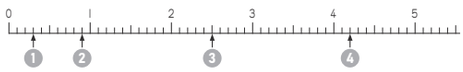
1.2 L

2



2.6 cm

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 0.3 How many 0.1's 3 2 Number 0.9 How many 0.1's 9

3 Number 2.5 How many 0.1's 25 1 Number 4.2 How many 0.1's 42

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	0.5	2	2.2	3	8.2	4	1.0 or 1
5	8.0 or 8	6	9.1	7	3.4	8	1.8
9	0.2	10	1.4	11	0.2	12	8.9

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15 - 1 Multiplication Algorithm-2 — Multiplication of Tens

Example 1 Calculate 5 × 30.

5 × 3 = 15

10 times ↓ ↓ 10 times

5 × 30 = 150

When the number in the multiplier becomes 10 times as much, the answer also becomes 10 times as much.

5 × 30 = 150

The answer for 5 × 30 is the same as 10 times as much as 5 × 3. Therefore, the answer is the same as placing a 0 to the right of 15.

1 Calculate the following multiplication problems.

1 5 × 50 = 250 2 4 × 30 = 120 3 6 × 60 = 360

4 8 × 40 = 320 5 9 × 70 = 630 6 7 × 20 = 140

Example 2 Calculate 12 × 30.

12 × 3 = 36

10 times ↓ ↓ 10 times

12 × 30 = 360

When the number in the multiplier becomes 10 times as much, the answer also becomes 10 times as much. This is the same as in example 1.

12 × 30 = 360

The answer for 12 × 30 is the same as 10 times as much as 12 × 3. Therefore, the answer is the same as placing a 0 to the right of 36.

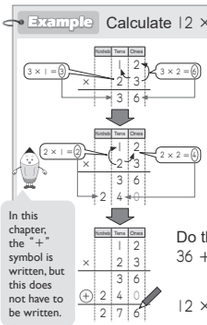
2 Calculate the following multiplication problems.

1 12 × 40 = 480 2 23 × 20 = 460 3 32 × 30 = 960

4 26 × 30 = 780 5 31 × 40 = 1240 6 60 × 30 = 1800

15 - 2 Multiplication Algorithm-2 — Multiplication by 2-Digit Numbers (1)

Example Calculate 12 × 23 by using the algorithm.



Line up the numbers vertically in each place.

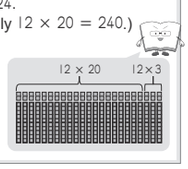
3 times 12 is 36.
(This is actually 12 × 3 = 36.)

2 times 12 is 24.
(This is actually 12 × 20 = 240.)

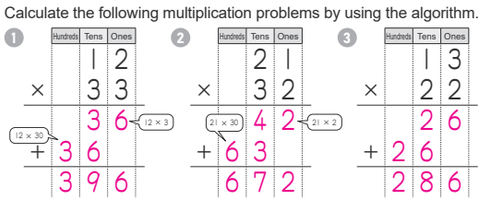
Do the addition.
36 + 240 = 276

12 × 23 = 276

In this chapter, the "+" symbol is written, but this does not have to be written.



Calculate the following multiplication problems by using the algorithm.



4 21 × 14 5 31 × 12 6 41 × 12 7 23 × 21

8 33 × 11 9 24 × 21 10 14 × 22 11 42 × 11

4	294	5	372	6	492	7	483
8	363	9	504	10	308	11	462

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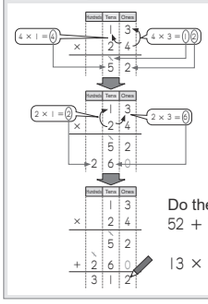
15 - 3 Multiplication Algorithm-2
Multiplication by 2-Digit Numbers (2)

Example Calculate 13 × 24 by using the algorithm.



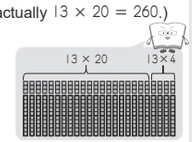
Line up the numbers vertically in each place.

4 times 13 is 52.
(This is actually 13 × 4 = 52.)

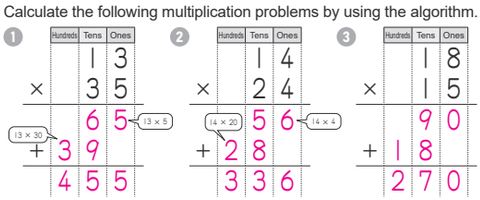
2 times 13 is 26.
(This is actually 13 × 20 = 260.)

Do the addition.
52 + 260 = 312

13 × 24 = 312



Calculate the following multiplication problems by using the algorithm.

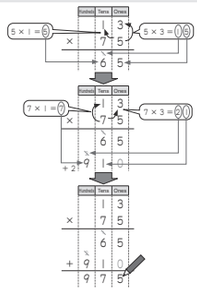


❹ 24 × 23 ❺ 47 × 12 ❻ 26 × 13 ❼ 23 × 34
❽ 25 × 13 ❾ 27 × 12 ❿ 39 × 12 ⓫ 19 × 14

❹	552	❺	564	❻	338	❼	782
❽	325	❾	324	❿	468	⓫	266

15 - 4 Multiplication Algorithm-2
Multiplication by 2-Digit Numbers (3)

Example Calculate 13 × 75 by using the algorithm.



Line up the numbers vertically in each place.

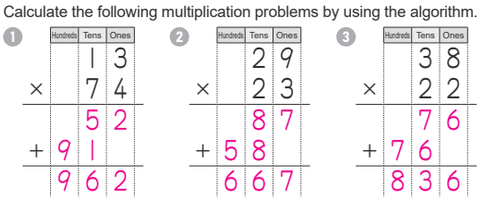
5 times 13 is 65.
(This is actually 13 × 5 = 65.)

7 times 13 is 91.
(This is actually 13 × 70 = 910.)

Do the addition.
65 + 910 = 975

13 × 75 = 975

Calculate the following multiplication problems by using the algorithm.



❹ 19 × 34 ❺ 15 × 36 ❻ 28 × 32 ❼ 37 × 22
❽ 17 × 44 ❾ 18 × 35 ❿ 27 × 33 ⓫ 14 × 57

❹	646	❺	540	❻	896	❼	814
❽	748	❾	630	❿	891	⓫	798

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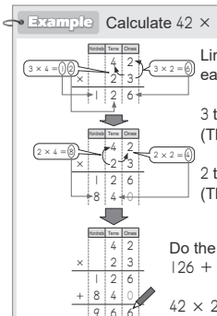
15 - 5 Multiplication Algorithm-2
Multiplication by 2-Digit Numbers (4)

Example Calculate 42 × 23 by using the algorithm.



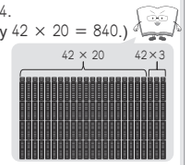
Line up the numbers vertically in each place.

3 times 42 is 126.
(This is actually 42 × 3 = 126.)

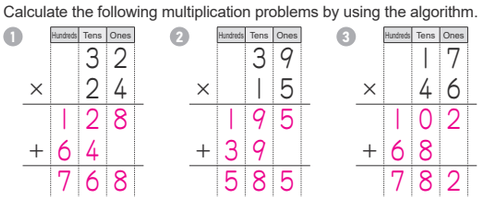
2 times 42 is 84.
(This is actually 42 × 20 = 840.)

Do the addition.
126 + 840 = 966

42 × 23 = 966



Calculate the following multiplication problems by using the algorithm.

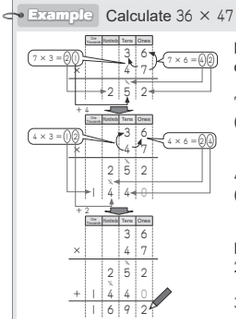


❹ 24 × 37 ❺ 43 × 19 ❻ 56 × 14 ❼ 42 × 18
❽ 38 × 26 ❾ 18 × 36 ❿ 27 × 37 ⓫ 54 × 13

❹	888	❺	817	❻	784	❼	756
❽	988	❾	648	❿	999	⓫	702

15 - 6 Multiplication Algorithm-2
Multiplication by 2-Digit Numbers (5)

Example Calculate 36 × 47 by using the algorithm.



Line up the numbers vertically in each place.

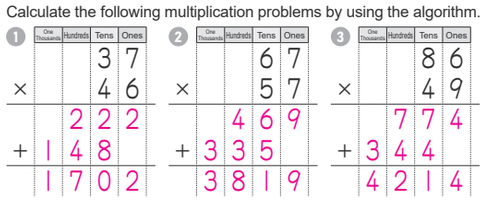
7 times 36 is 252.
(This is actually 36 × 7 = 252.)

4 times 36 is 144.
(This is actually 36 × 40 = 1440.)

Do the addition.
252 + 1440 = 1692

36 × 47 = 1692

Calculate the following multiplication problems by using the algorithm.



❹ 52 × 38 ❺ 63 × 76 ❻ 77 × 44 ❼ 38 × 56
❽ 65 × 47 ❾ 89 × 36 ❿ 58 × 49 ⓫ 76 × 63

❹	1976	❺	4788	❻	3388	❼	2128
❽	3055	❾	3204	❿	2842	⓫	4788

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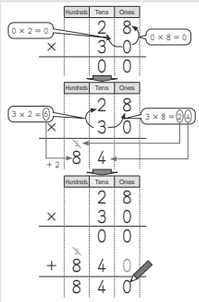
15 - 7 Multiplication Algorithm-2
Multiplication by 2-Digit Numbers (6)

Example Calculate 28 × 30 by using the algorithm.



Line up the numbers vertically in each place.

0 times 28 is 0.
(This is actually 28 × 0 = 0.)

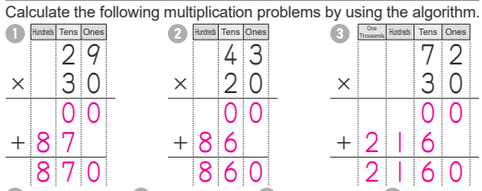
3 times 28 is 84.
(This is actually 28 × 30 = 840.)

Write a 4 in the tens place and a 8 in the hundreds place.

Do the addition.
0 + 840 = 840

28 × 30 = 840

Calculate the following multiplication problems by using the algorithm.



① 29 × 30 = 870 ② 43 × 20 = 860 ③ 72 × 30 = 2160

④ 47 × 60 ⑤ 74 × 60 ⑥ 86 × 40 ⑦ 27 × 80

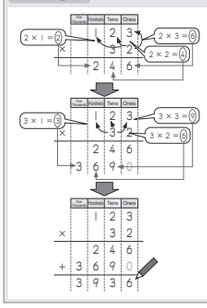
⑧ 76 × 90 ⑨ 63 × 70 ⑩ 83 × 50 ⑪ 64 × 50

Regarding problem (11), pay attention to the number of 0s.

④	2820	⑤	4440	⑥	3440	⑦	2160
⑧	6840	⑨	4410	⑩	4150	⑪	3200

15 - 8 Multiplication Algorithm-2
3-Digit × 2-Digit Calculation (1)

Example Calculate 123 × 32 by using the algorithm.



Line up the numbers vertically in each place.

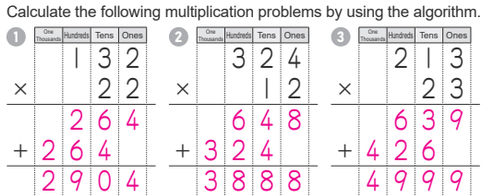
2 times 123 is 246.
(This is actually 123 × 2 = 246.)

3 times 123 is 369.
(This is actually 123 × 30 = 3690.)

Do the addition.
246 + 3690 = 3936

123 × 32 = 3936

Calculate the following multiplication problems by using the algorithm.



① 132 × 22 = 2904 ② 324 × 12 = 3888 ③ 213 × 23 = 4899

④ 221 × 34 ⑤ 112 × 53 ⑥ 144 × 21 ⑦ 331 × 21

⑧ 133 × 12 ⑨ 243 × 22 ⑩ 342 × 12 ⑪ 233 × 23

④	7514	⑤	5936	⑥	3024	⑦	6951
⑧	1596	⑨	5346	⑩	4104	⑪	5359

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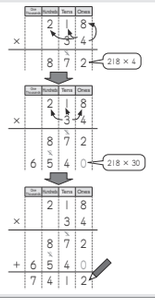
15 - 9 Multiplication Algorithm-2
3-Digit × 2-Digit Calculation (2)

Example Calculate 218 × 34 by using the algorithm.



Line up the numbers vertically in each place.

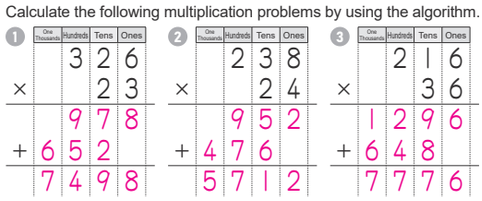
4 times 218 is 872.
(This is actually 218 × 4 = 872.)

3 times 218 is 654.
(This is actually 218 × 30 = 6540.)

Do the addition.
872 + 6549 = 7412

218 × 34 = 7412

Calculate the following multiplication problems by using the algorithm.



① 326 × 23 = 7498 ② 238 × 24 = 5712 ③ 216 × 36 = 7776

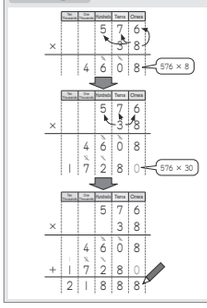
④ 129 × 45 ⑤ 145 × 56 ⑥ 359 × 27 ⑦ 229 × 23

⑧ 368 × 26 ⑨ 156 × 38 ⑩ 374 × 26 ⑪ 167 × 29

④	5805	⑤	8120	⑥	9693	⑦	5267
⑧	9565	⑨	5928	⑩	9724	⑪	4843

15 - 10 Multiplication Algorithm-2
3-Digit × 2-Digit Calculation (3)

Example Calculate 576 × 38 by using the algorithm.



Line up the numbers vertically in each place.

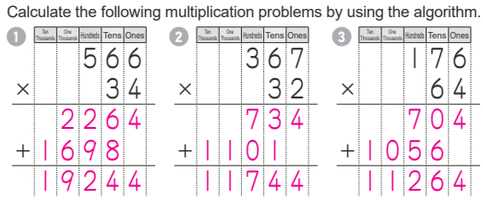
8 times 576 is 4608.
(This is actually 576 × 8 = 4608.)

3 times 576 is 1728.
(This is actually 576 × 30 = 17280)

Do the addition.
4608 + 17280 = 21888

576 × 38 = 21888

Calculate the following multiplication problems by using the algorithm.



① 566 × 34 = 19244 ② 367 × 32 = 11744 ③ 176 × 64 = 11264

④ 748 × 15 ⑤ 458 × 67 ⑥ 567 × 49 ⑦ 386 × 48

⑧ 169 × 87 ⑨ 768 × 35 ⑩ 687 × 49 ⑪ 183 × 96

④	11220	⑤	30686	⑥	27783	⑦	18528
⑧	14703	⑨	26880	⑩	33663	⑪	17568

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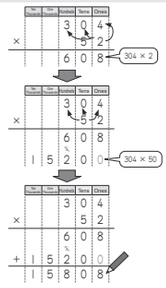
15 - 11 Multiplication Algorithm-2
3-Digit × 2-Digit Calculation (4)

Example Calculate 304 × 52 by using the algorithm.



Line up the numbers vertically in each place.

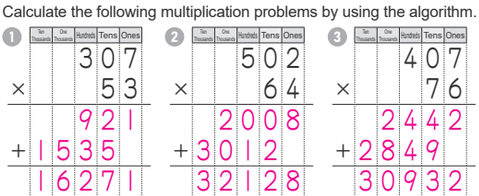
2 times 304 is 608.
(This is actually 304 × 2 = 608.)

5 times 304 is 1520.
(This is actually 304 × 50 = 15200)

Do the addition.
608 + 15200 = 15808

304 × 52 = 15808

Calculate the following multiplication problems by using the algorithm.

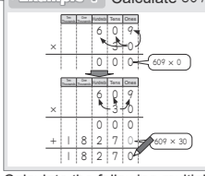


④ 706 × 83	⑤ 809 × 94	⑥ 608 × 47	⑦ 506 × 47
⑧ 409 × 38	⑨ 705 × 75	⑩ 808 × 88	⑪ 605 × 37

④	58598	⑤	76046	⑥	28576	⑦	23782
⑧	15542	⑨	52875	⑩	71104	⑪	22385

15 - 12 Multiplication Algorithm-2
3-Digit × 2-Digit Calculation (5)

Example 1 Calculate 609 × 30 by using the algorithm.



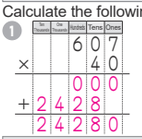
Line up the numbers vertically in each place.
0 times 609 is 0.
(This is actually 609 × 0 = 0.)

3 times 609 is 1827.
(This is actually 609 × 30 = 18270.)

Do the addition.
0 + 18270 = 18270.

609 × 30 = 18270

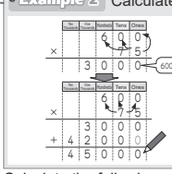
Calculate the following multiplication problems by using the algorithm.



② 506 × 80 ③ 407 × 90
④ 308 × 70 ⑤ 704 × 50

②	40480	③	36630	④	21560	⑤	35200

Example 2 Calculate 600 × 75 by using the algorithm.



Line up the numbers vertically in each place.

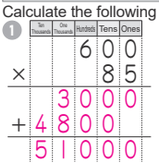
5 times 600 is 3000.
(This is actually 600 × 5 = 3000.)

7 times 600 is 4200.
(This is actually 600 × 70 = 42000.)

Do the addition
3000 + 42000 = 45000

600 × 75 = 45000

Calculate the following multiplication problems by using the algorithm.



② 700 × 48 ③ 800 × 37
④ 500 × 68 ⑤ 400 × 97

②	33600	③	29600	④	34000	⑤	38800

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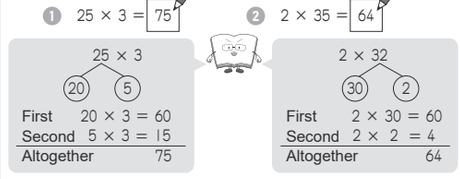
15 - 13 Multiplication Algorithm-2
Mental Calculation

Example Think about how to calculate these problems in your head.

① 25 × 3 = 75 ② 2 × 35 = 64



Think about how to calculate the following multiplication problems in your head.

① 23 × 3 = 69
20 3
20 × 3 =
3 × 3 =

② 42 × 2 = 84
40 2
40 × 2 =
2 × 2 =

③ 15 × 3 = 45
10 5
10 × 3 =
5 × 3 =

④ 21 × 4 = 84
20 1
20 × 4 =
1 × 4 =

⑤ 25 × 2 = 50
⑥ 33 × 3 = 99
⑦ 32 × 4 = 128
⑧ 3 × 25 = 75
⑨ 4 × 23 = 92
⑩ 5 × 13 = 65
⑪ 2 × 34 = 68
⑫ 6 × 12 = 72

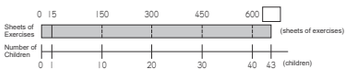
15 - 14 Multiplication Algorithm-2
Multiplication Problems

Example There are 35 students in my class. The teacher will give 12 sheets of paper to each student. How many sheets of paper does the teacher need?

Math Sentence 12 × 35 = 420
Answer 420 sheets of paper

Answer the following problems.

① There are 43 children in the class. The teacher will provide 15 sheets of exercises to each child. How many sheets of exercises does the teacher need?



Math Sentence 15 × 43 = 645
Answer 645 sheets of exercises

② The length of one train car is 25 m. How long is the total length of a train with 17 cars?

Math Sentence 25 × 17 = 425
Answer 425 m

15 - 15 Multiplication Algorithm-2 Review

1 Calculate the following problems in your head.

① 6 × 70 = 420 ② 4 × 40 = 160 ③ 8 × 60 = 480
④ 12 × 30 = 360 ⑤ 32 × 20 = 640 ⑥ 60 × 40 = 2400
⑦ 25 × 3 = 75 ⑧ 32 × 3 = 96 ⑨ 2 × 36 = 72

2 Calculate these multiplication problems by using the algorithm.

① 32 × 13 = 416
② 26 × 15 = 390
③ 28 × 23 = 644
④ 56 × 13 = 728
⑤ 46 × 38 = 1748
⑥ 224 × 21 = 4704
⑦ 359 × 26 = 9334
⑧ 576 × 35 = 20160

3 There are 32 boxes containing 24 cans of orange juice each. How many cans of orange juice are there altogether?

Math Sentence: 24 × 32 = 768

Answer: 768 cans of orange juice

16 - 1 Expressing Math Sentence Using a □ Addition and Subtraction (1)

Example Express the following story with an addition math sentence. You can use a □ as the unknown number. Then find the answer.

There were 38 tomatoes in my house. Because my mother bought some new tomatoes today, there are now 50 tomatoes. How many tomatoes did my mother buy?

Math Sentence: 38 + □ = 50

How to find a number in the □: 50 − 38 = 12

Answer: 12 tomatoes

Express the following stories with addition math sentences. You can use a □ as the unknown number. Then find the answers.

① There were 34 students in my classroom. Because some students came from the next classroom, there are now 47 students in my classroom. How many students came from the next classroom?

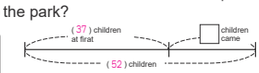
Math Sentence: 34 + □ = 47

How to find a number in the □: 47 − 34 = 13

Answer: 13 students

② There were 37 children playing in the park. Then some additional children came. Now there are 52 children in the park. How many children came to the park?

Math Sentence: 37 + □ = 52



How to find a number in the □: 52 − 37 = 15

Answer: 15 children

16 - 2 Expressing Math Sentence Using a □ Addition and Subtraction (2)

Example Express the following story with an addition math sentence. You can use a □ as the unknown number. Then find the answer.

There were some tomatoes in my house. Because my mother bought 12 new tomatoes today, there are 50 tomatoes now. How many tomatoes were there at first?

Math Sentence: □ + 12 = 50

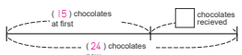
How to find a number in the □: 50 − 12 = 38

Answer: 38 tomatoes

Express the following stories with subtraction math sentences. You can use a □ as the unknown number. Then find the answers.

① I had 15 chocolates. My friends gave me some more chocolates. Now I have 24 chocolates. How many chocolates did my friends give me?

Math Sentence: 24 − □ = 15



How to find a number in the □: 24 − 15 = 9

Answer: 9 chocolates

② There were 72 books in my class library. Some students borrowed some books. There are now only 39 books left. How many books were borrowed by the students?

Math Sentence: 72 − □ = 39

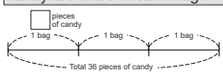
How to find a number in the □: 72 − 39 = 33

Answer: 33 books

16 - 3 Expressing Math Sentence Using a □ Multiplication and Division (1)

Example Express the following story with an addition math sentence. You can use a □ as the unknown number. Then find the answer.

There are 3 bags containing the same number of candy each. The total number of candy is 36 pieces. How many pieces of candy are there in each bag?



Math Sentence: □ × 3 = 36

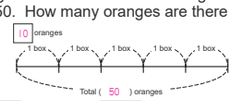
How to find a number in the □: 36 ÷ 3 = 12

Answer: 12 pieces of candy

Express the following stories with multiplication math sentences. You can use a □ as the unknown number. Then find the answers.

① There are 5 boxes containing the same number of oranges. The total number of oranges is 50. How many oranges are there in each box?

Math Sentence: □ × 50 = 50



How to find a number in the □: 50 ÷ 5 = 10

Answer: 10 oranges

② My father bought 7 packages of chocolates. There are 63 pieces of chocolate altogether. How many pieces of chocolate does each package has?

Math Sentence: □ × 7 = 63

How to find a number in the □: 63 ÷ 7 = 9

Answer: 9 pieces of chocolate

16 - 4 Expressing Math Sentence Using a □
Multiplication and Division (2)

Example Express the following story with an addition math sentence. You can use a □ as the unknown number. Then find the answer.

36 pieces of candy are divided up equally. Each person gets 3 pieces. How many people are there altogether?

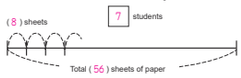
Math Sentence: 36 ÷ □ = 3

How to find a number in the □: 36 ÷ 3 = 12

Answer: 12 people

Express the following stories with division math sentences. You can use a □ as the unknown number. Then find the answers.

1. There are 56 sheets of paper. These are divided equally, and each student ends up with 8 sheets each. How many students are there?



Math Sentence: 56 ÷ □ = 8

How to find a number in the □: 56 ÷ 8 = 7

Answer: 7 students

2. 36 biscuits are divided equally among some children and each child gets 4 biscuits. How many children are there?

Math Sentence: 36 ÷ □ = 4

How to find a number in the □: 36 ÷ 4 = 9

Answer: 9 children

16 - 5 Expressing Math Sentence Using a □
Review

Express the following stories with division math sentences. You can use a □ as the unknown number. Then find the answers.

1. There were 25 students reading books in the library. More students came and now there are 37 students in the library. How many students came to the library?

Math Sentence: 25 + □ = 37

How to find a number in the □: 37 − 25 = 12

Answer: 12 students

2. There were 64 people participating in the sports festival. Then some people went back home. Now there are only 28 people. How many people went back home?

Math Sentence: 64 − □ = 28

How to find a number in the □: 64 − 28 = 36

Answer: 36 people

3. My mother bought 7 boxes containing some pieces of chocolate. Now there are 56 pieces of chocolate altogether. How many pieces of chocolate are there in each box?

Math Sentence: □ × 7 = 56

How to find a number in the □: 56 ÷ 7 = 8

Answer: 8 pieces of chocolate

4. 44 biscuits are divided equally among some children and each child gets 4 biscuits each. How many children are there?

Math Sentence: 44 ÷ □ = 4

How to find a number in the □: 44 ÷ 4 = 11

Answer: 11 children

Number & Operation

Entire Grade-3 Review (1)

1. Calculate the following problems by using the algorithm.

1) 351 + 574 = 925
2) 526 + 179 = 705
3) 347 + 658 = 1005
4) 4876 + 1129 = 6005
5) 832 − 458 = 374
6) 305 − 178 = 127
7) 5746 − 3789 = 1957
8) 7006 − 957 = 6049

2. Calculate the following problems by using the algorithm.

1) 94 × 4 = 376
2) 141 × 6 = 846
3) 506 × 5 = 2530
4) 385 × 8 = 3080
5) 27 × 25 = 675
6) 39 × 50 = 1950
7) 304 × 27 = 8208
8) 452 × 29 = 13108

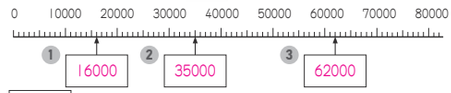
3. Calculate the following division problems.

1) 64 ÷ 8 = 8
2) 42 ÷ 6 = 7
3) 70 ÷ 7 = 10
4) 84 ÷ 4 = 21
5) 46 ÷ 7 = 6 R 4
6) 52 ÷ 9 = 5 R 7
7) 76 ÷ 8 = 9 R 4

4. Calculate the following problems.

1) 1.3 + 0.6 = 1.9
2) 2.7 + 4.5 = 7.2
3) 1.9 − 0.5 = 1.4
4) 8 − 4.7 = 3.3
5) $\frac{1}{5}+\frac{3}{5}=\frac{4}{5}$
6) $\frac{7}{8}+\frac{1}{8}=\frac{8}{8}$ or 1
7) $\frac{6}{7}-\frac{3}{7}=\frac{3}{7}$
8) $1-\frac{3}{10}=\frac{7}{10}$

5. Write the numbers in the □.



1) 16000
2) 35000
3) 62000

4) 30502 is made of 3 ten thousands, 5 hundreds and 2 ones.
5) 4.8 is made of 4 1's (ones) and 8 0.1's.
6) 2.7 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: 24 ÷ 8 = 3

Answer: 3 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: 40 ÷ 6 = 6R4, 6 + 1 = 7

Answer: 7 boxes

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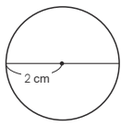
Geometry

Entire Grade-3 Review (2)

1 How many cm are the radius and diameter of the following circles?

1



Radius [2] cm

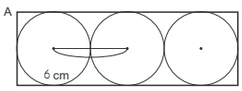
Diameter [4] cm

2 If a circle has a 7 cm radius, the diameter is [14] cm.

3 If a circle has a 24 cm diameter, the radius is [12] cm.

4 If a circle has a 50 cm diameter, the radius is [25] cm.

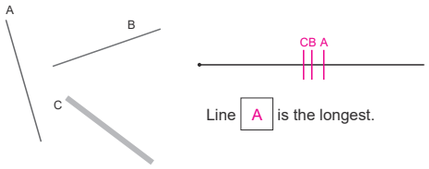
2 How long is the length of AB?



The length of [18] cm.

3 Compare the lengths of the lines. Which of the following three straight lines below is the longest?

1

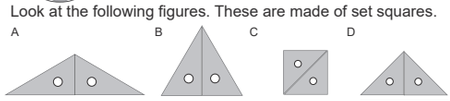


Line [A] is the longest.

4 There are 4 balls placed vertically in a container as shown below. The diameter of a ball is 4 cm. How many cm is the height of the container?

The height is [16] cm.

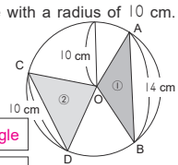
5 Look at the following figures. These are made of set squares.



1 Which of these triangles are equilateral triangles? [B]

2 Which of these triangles are isosceles triangles? [A, D, (B)]

6 There are two triangles in the circle with a radius of 10 cm. Point O is the centre of the circle.



1 How long is OA? [10] cm

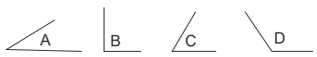
2 How long is OC? [10] cm

3 What kind of triangle is Triangle ① ? [Isosceles triangle]

4 What kind of triangle Is Triangle ② ? [Equilateral triangle]

7 Compare the size of angles below and list them from the largest to the smallest.

1



[D, B, C, A]

2

[C, D, B, A]

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Measurement

Entire Grade-3 Review (3)

1 Fill in the ☐ with the appropriate numbers.

1 120 seconds = [2] minute **2** 1 minutes = [60] seconds

3 185 seconds = [3] minutes [5] seconds

4 350 seconds = [5] minutes [50] seconds

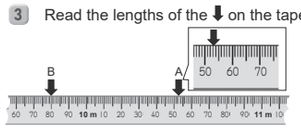
2 Look at the following pictures and make time problems. Then find the answers.

A: A café opens at 10:30 a.m. You left your house at 8:50 a.m.

B: It's 10:30 a.m. The coming train started at 9:50 a.m.

Answer [A]

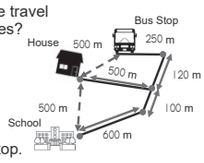
3 Read the lengths of the ⬇ on the tape measure below.



A is [10] m [53] cm.

B is [9] m [80] cm.

4 What is the direct distance and the travel distance between the following places?



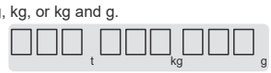
1 Between the house and the bus stop.

Direct distance is [500] m Travel distance is [870] m

2 Between the house and the school.

Direct distance is [500] m Travel distance is [1200] m

5 Convert the weights to g, kg, or kg and g.



1 5 kg = [5000] g

2 9000 kg = [9] t

3 3500 g = [3] kg [500] g

4 1355 kg = [1] t [355] kg

5 1 t 20 kg = [1020] kg

6 5 kg 15 g = [5015] g

6 Fill in the ☐ with the appropriate numbers.

1 Units of Length

1 km = [1000] m

1 m = [100] cm

1 cm = [10] mm

2 Units of Capacity

1 L = [10] dL = [1000] mL

1 dL = [100] mL

3 Units of Weight

1 t = [1000] kg

1 kg = [1000] g

1 g = [1000] mg

4 Units of Time

1 day = [24] hours

1 hour = [60] minutes

1 minute = [60] seconds

7 Fill in the ☐ with appropriate units of quantities.

1 Length of a textbook 29 [cm]

2 Weight of 1 L of water 1 [kg]

Data Utilization

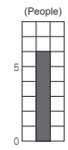
Entire Grade-3 Review (4)

1 Convert the tally into numerals and write the numbers in the table below. The tally shows the results of a class survey to find the top five what you want to be in the future.

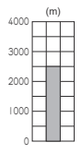
Doctor	𝍸 ///
Farmer	𝍸 𝍸 /
Engineer	𝍸 //
Teacher	//
Bus driver	//

Occupation you want to be	Farmer	Doctor	Engineer	Teacher	Bus driver	Total
Number of people	11	8	7	2	2	30

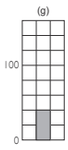
2 In the bar graph below, how many units does one mark on the scale represent? how many units are shown in the bar?

1 

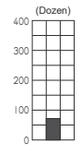
One mark 1 people
The bar shows 6 people

2 

One mark 500 m
The bar shows 2500 m

3 

One mark 20 g
The bar shows 40 g

4 

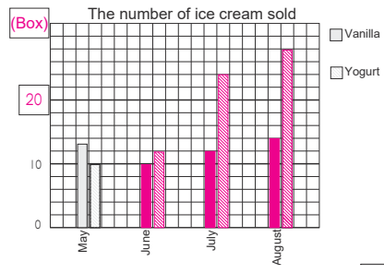
One mark 50 dozen
The bar shows 75 dozen

3 The tables below show the best two types of ice cream flavors sold over four months to decide how much ice cream to buy from wholesaler.

1 Complete the table below

Type \ Month	May	June	July	August	Total(Box)
Vanilla	13	10	12	14	49
Yogurt	10	12	24	28	74
Total	23	22	36	42	123

2 Complete the bar graph.



3 What flavour was sold more over four months? Yogurt

4 Which flavour was sold constantly every month? Vanilla

5 Which description is the correct decision based on the above graph?

A. It is better to buy more than 20 boxes of vanilla flavour from wholesaler because the sale of vanilla flavour increased every month.
B. It is necessary to buy yogurt flavour more from wholesaler because the sale of yogurt increased since May rapidly.
C. It is enough to buy 15 boxes of yogurt flavour from wholesaler every month because 10 to 14 boxes were sold since May.

Answer B