Maths

Pupil's Book

Contents

Welcome back!

In • On • Under

Numbers from 1 to 10
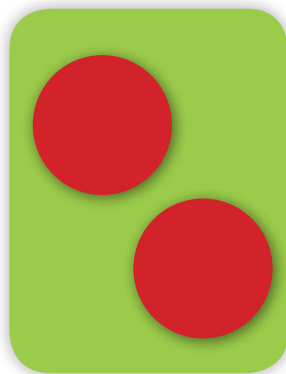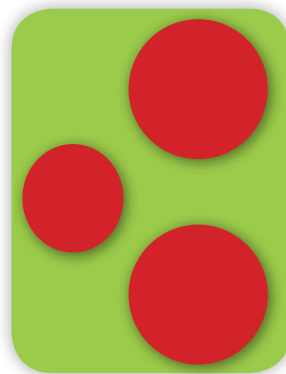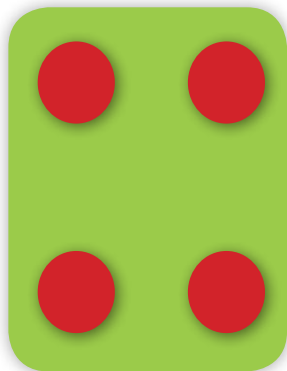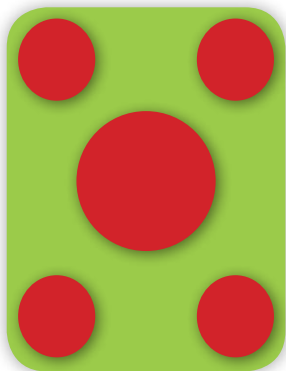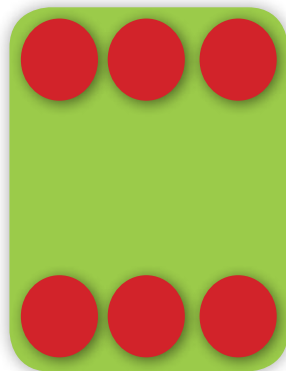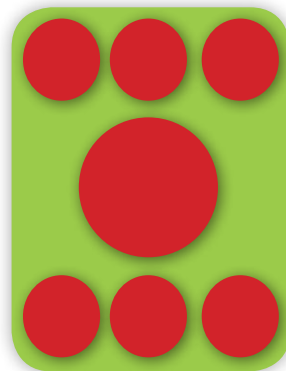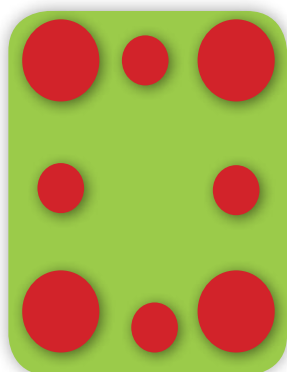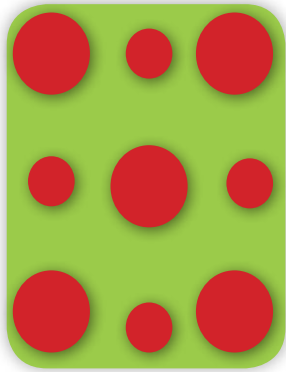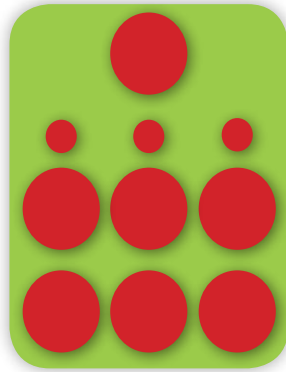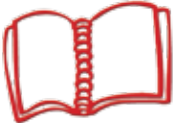
0	1	2	3
4	5	6	7
8	9	10	Open your Activity book at page 3.

The new friends

=	>	<
equal to	greater than	less than

Size

🚲 **<** ✈️ **>** 🚗

Amount
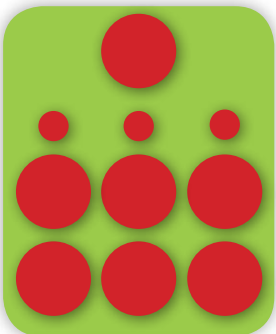
🔴(10) **>** 🔴(5) **>** 🔴(2)

| 10 | 5 | 2 |
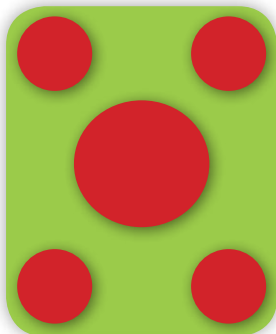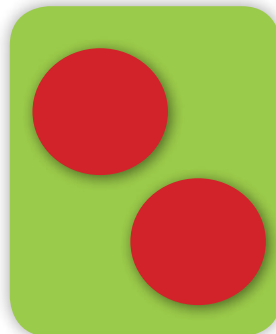
🔴(2) **=** 🔴(2)
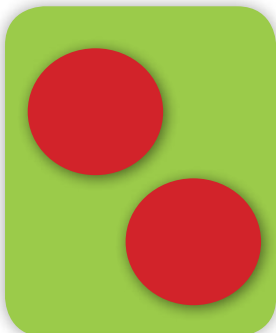
| 2 | 2 |
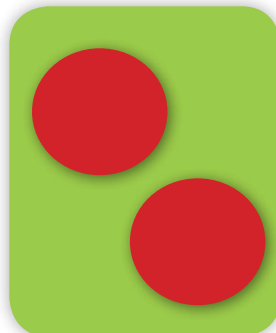
Open your
Activity book
at page 4.

4

The number line

Number line

1 2 3 4 5 6 7 8 9 10

Ascendent

+1

1 2 3 4 5 6 7 8 9 10

Descendent

-1

1 2 3 4 5 6 7 8 9 10

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

Numbers up to 20

Green Dragon!
Come here and brush
your teeth and wash
your hands!

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

20 Teeth
=
20 Nails

Count the teeth.

Count your nails.

Make groups of equal
elements on your table.

Open your
Activity book
at page 7.

Colours

Green

White

Yellow

Orange

Red

Purple

Violet
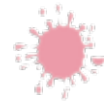
Pink

Blue

Black
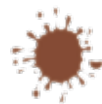
Brown

Open your Activity book at page 8.

7

Remember

Ascendent number line up to 10

1　2　3　4　5　6　7　8　9　10
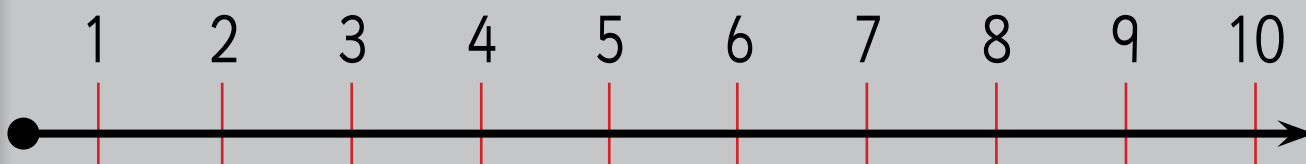
Descendent number line down to 1

10　9　8　7　6　5　4　3　2　1

Numbers up to 20

1	2	3	4	5	6	7	8	9	10
one	two	three	four	five	six	seven	eight	nine	ten
11	12	13	14	15	16	17	18	19	20
eleven	twelve	thirteen	four-teen	fifteen	sixteen	seven-teen	eighteen	nine-teen	twenty

Greater than • Less than • Equal to

>	<	=
greater than	less than	equal to

A snack
Sets and subsets

Things with the same characteristics belong to the same set.

F

V

A
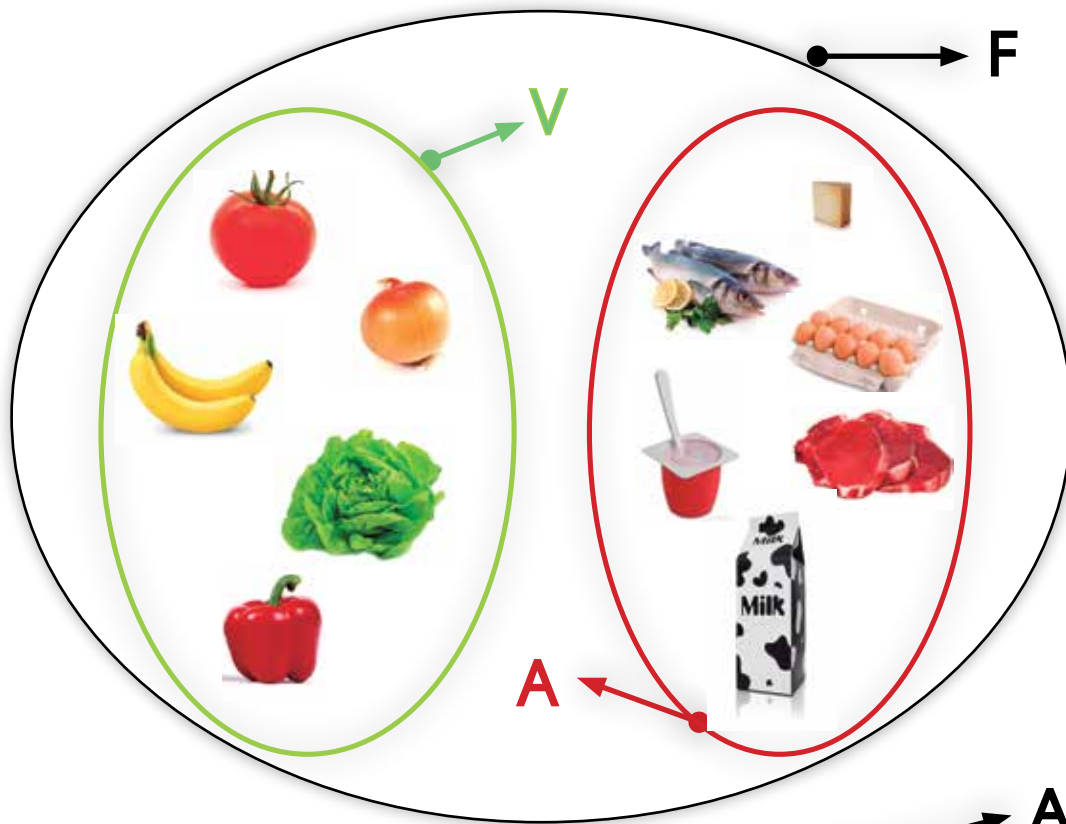
F = foods
V = vegetable food
A = animal food

A

E

S
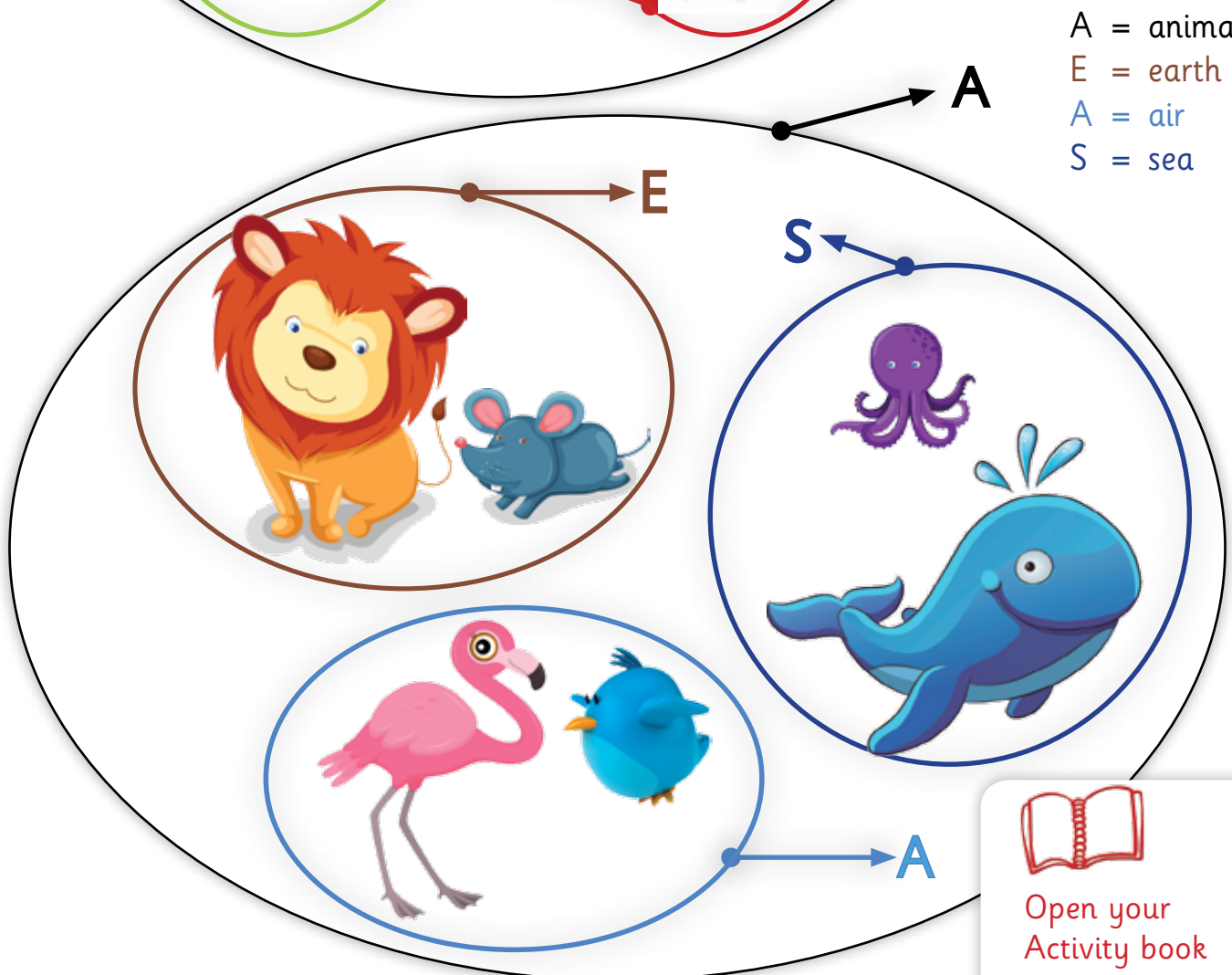
A = animals
E = earth
A = air
S = sea

A

9

Make-up and breakdown of numbers up to 10

Specific breakdown	Breakdown with pictures	Breakdown with numbers

Make-up with pictures and numbers.

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

Open your Activity book at pages 13-14.

Position of numbers, units and tens.

Unit	Ten
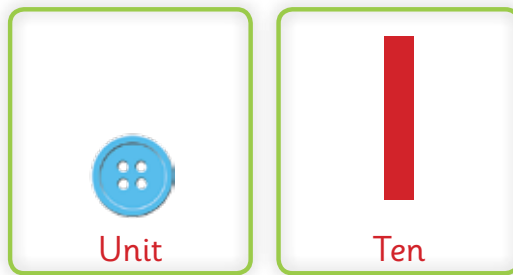
10 units are 1 ten
10 U = 1 T

1 ten is 10 units
1 T = 10 U

Tens	Units
1	0

Tens	Units
1	3

Tens	Units
2	0

Tens	Units
1	4

Open your Activity book at page 15.

Addition and subtraction

+	−	=
Plus	Minus	Equals

Addition +

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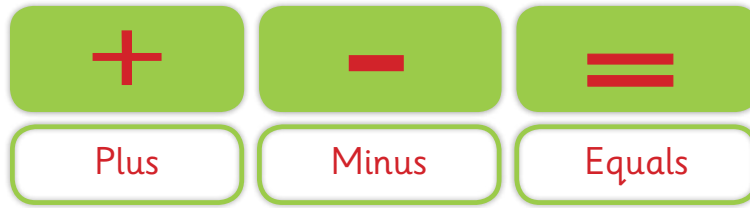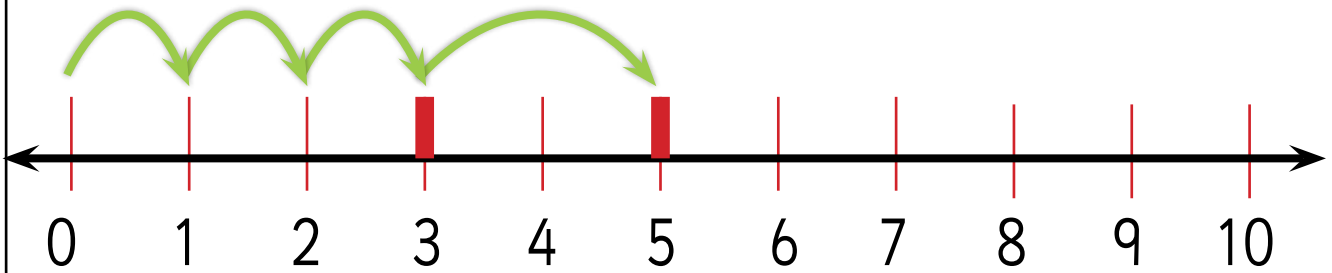
Addend   3

+ Addend   2

Total   5

$$3 + 2 = 5$$

Subtraction −

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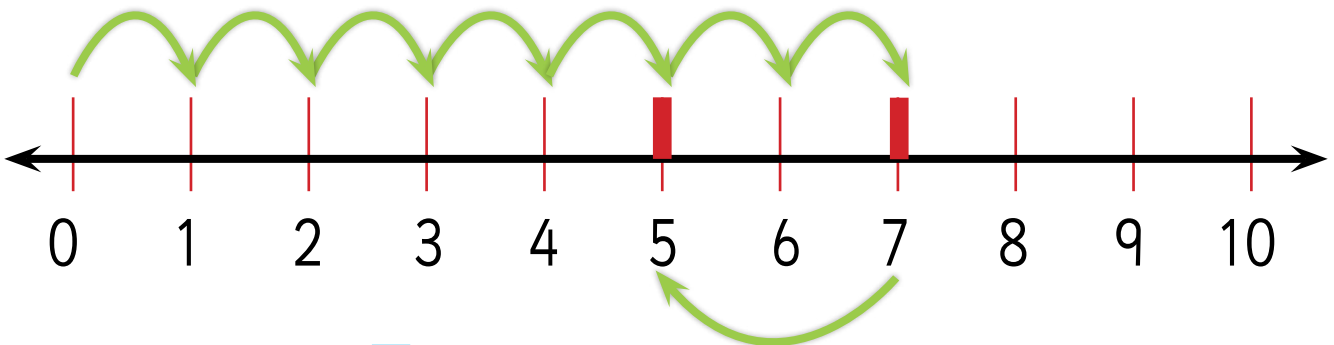
Minuend   7

− Subtrahend   2

Difference   5

$$7 - 2 = 5$$

Open your Activity book at page 16.

Remember

Sets and subsets

a b c d e f g
h i j k l ll m
n ñ o p q r s
t u v w x y z

L ⟶ L

V
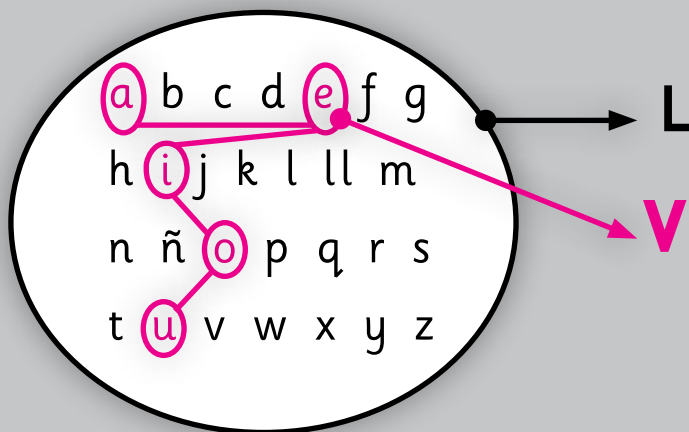
L = letters
V = vowels

Units and tens

= |
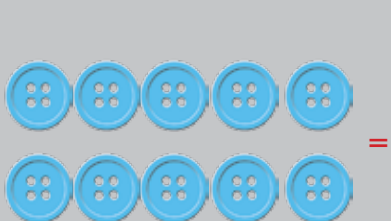
Tens	Units
1	0

10 U = 1 T
1 T = 10 U

= ‖
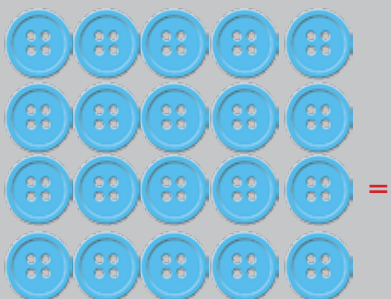
Tens	Units
2	0

10 U = 1 T
1 T = 10 U

+

0 1 2 3 4 5 6 7 8 9 10

−
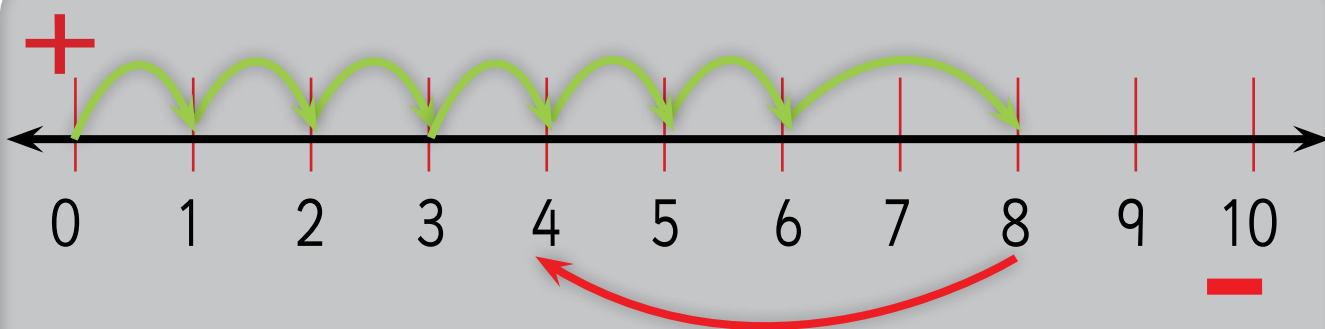
6 + 2 = 8   8 − 4 = 4

A night at the circus
Wide • Narrow
Width • Height
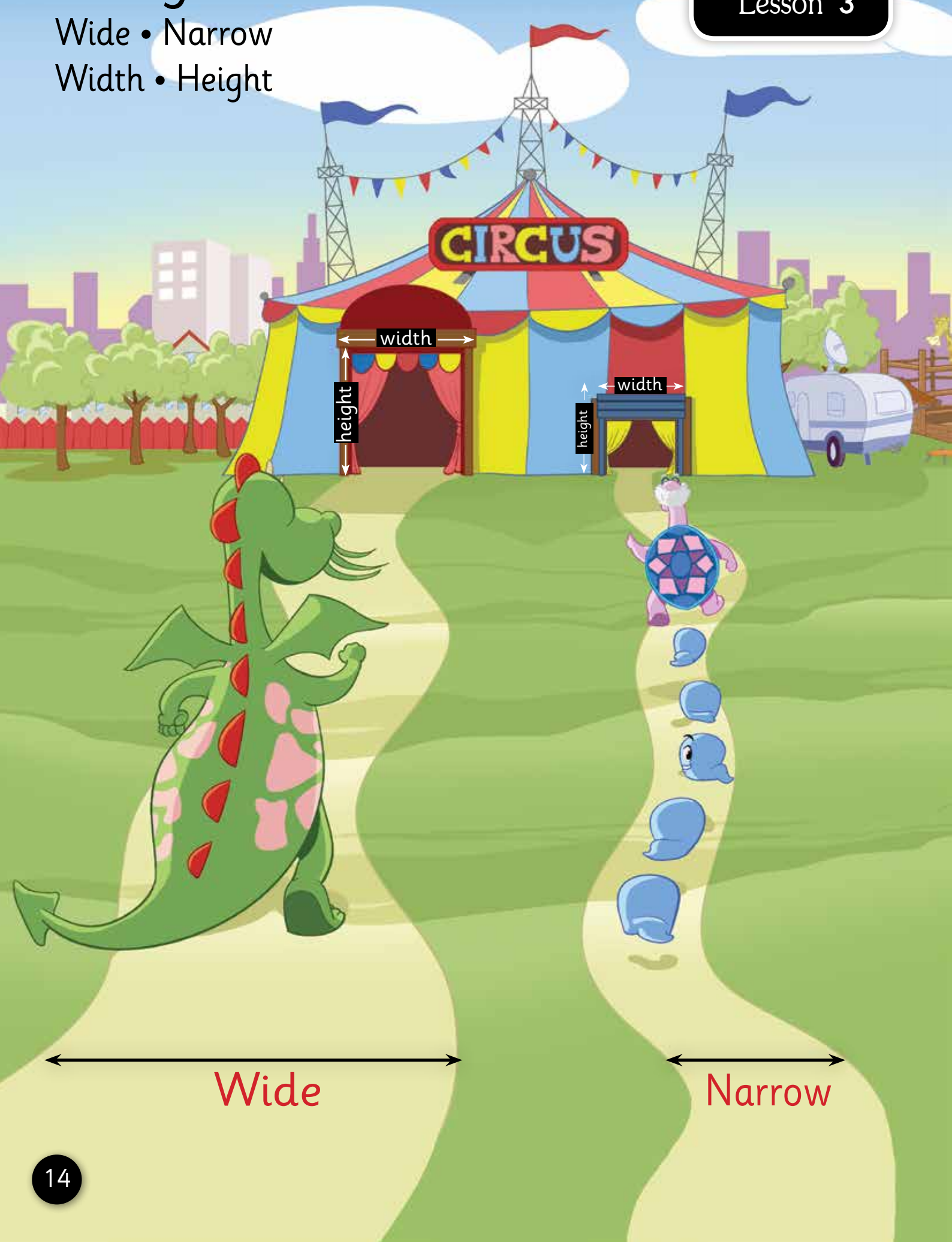
width

height

width

height

Wide

Narrow

Big • Medium • Small

Big

Medium

Small

Big

Medium

Small

Height

Yes
No
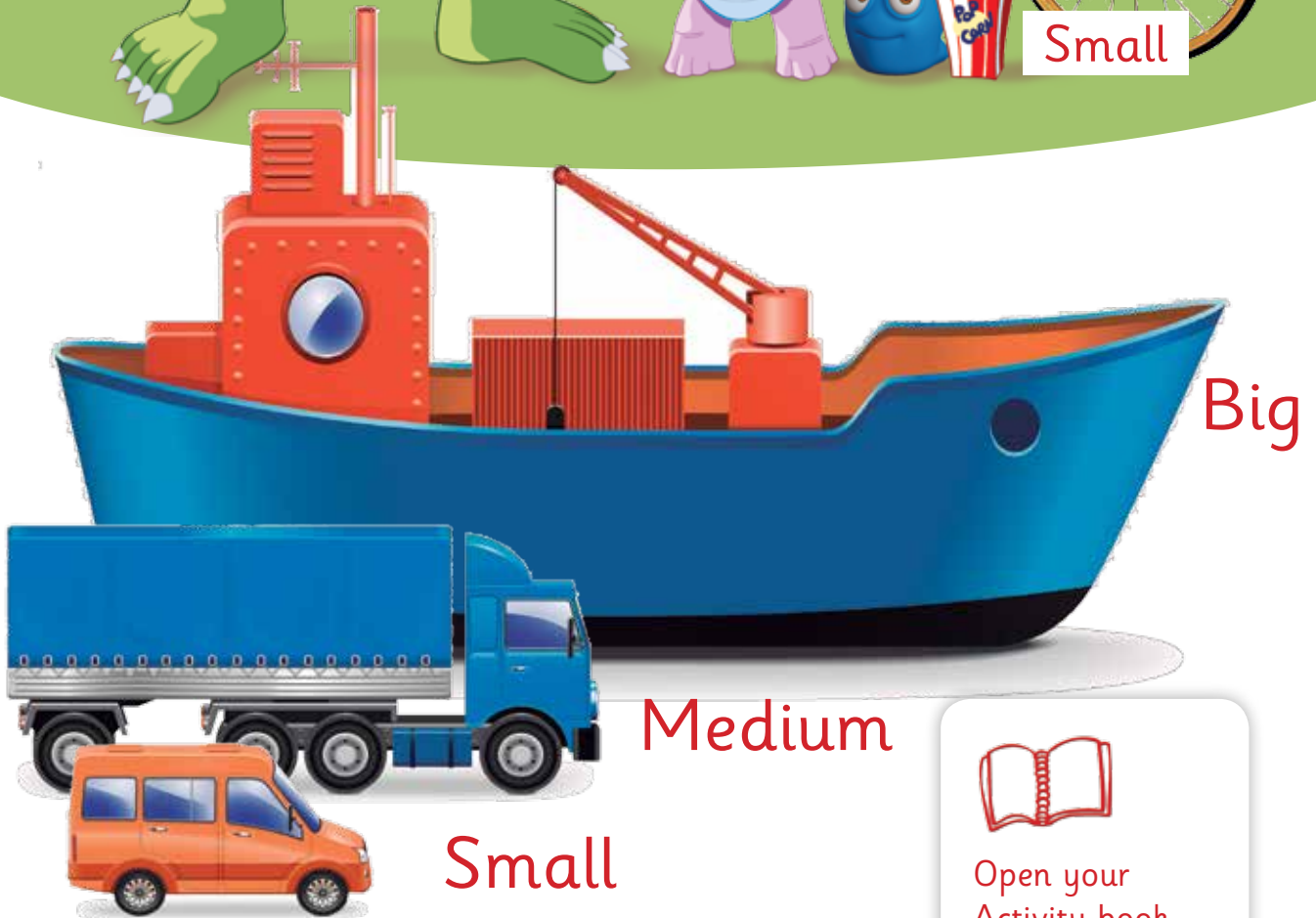
Open your Activity book at
pages 20-21.

The calendar • The date

March

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2 *Green Dragon's birthday*	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25 *circus*	26	27	28
29	30	31				

A week has 7 days:

Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday

A year has 12 months:

1. January
2. February
3. March
4. April
5. May
6. June
7. July
8. August
9. September
10. October
11. November
12. December

The date:

____3rd____ of ____March____ , ____2015____
   day   month   year

A day:
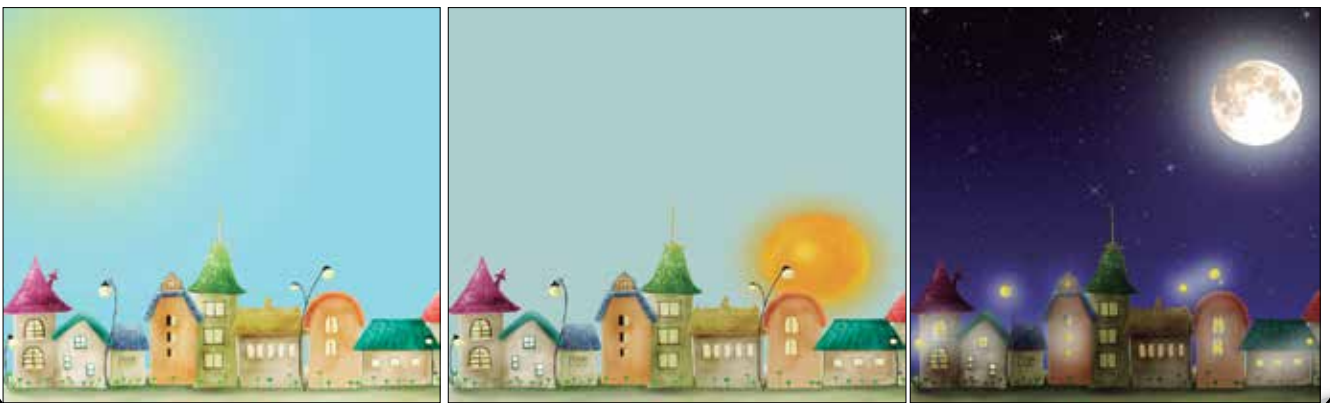
Remember

Width • Height

Width

Length
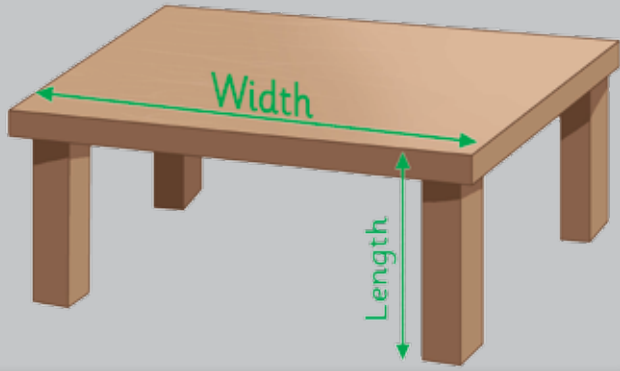
Wide • Narrow

Wide

Narrow

Big • Medium • Small
Tall • Short

Big

Medium

Small

The calendar

March

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2 Green Dragon's birthday	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25 circus	26	27	28
29	30	31				

A year has 12 months:

January	May	September
February	June	October
March	July	November
April	August	December

Maths

Pupil's Book

Contents

Welcome back!

I'm helping the people in the museum do the accounts. Let's do it together!

Addition with carrying over

H	T	U
1	3	3
+ 1	6	2
2	9	5

→ Addends

→ Addition

1st

Add the units: 6+5 = 11. This addition forms a ten. That's why we add that ten to the tens column.

H	T	U
2	7	6
+ 1	4	5
		¹1

2nd

Then we add the tens, taking care not to forget the ten we added to this column previously (7+4+1). This addition forms a hundred. That's why we add this hundred to the hundreds column.

H	T	U
2	7	6
+ 1	4	5
	¹2	1

3rd

Finally we add the hundreds, taking care not to forget the hundred we added to this column previously (2+1+1).

H	T	U
2	7	6
+ 1	4	5
4	2	1

Subtraction with carrying over

H	T	U	
5	8	6	→ Minuend
− 2	4	1	→ Subtrahend
3	4	5	→ Difference

1st

We subtract the units, 2 - 6. But because 2 is smaller than 6, we need to ask the tens column for help.

H	T	U
3	5	2
− 1	5	6

2nd

We take a ten from its column (5 - 1) so we can give 10 units to the units column (10 + 2). Now we can subtract 12 - 6 = 6

H	T (4)	U (12)
3	5̸	2
− 1	5	6
		6

3rd

We can't subtract 5 from 4, so we turn a hundred into 10 tens. Then we can do the operation, exactly as in the previous stage. Now it's 14 - 5 = 9

H (2)	T (14)	U
3̸	5̸	2
− 1	5	6
	9	6

4th

Now we just have to subtract the hundreds.

H (2)	T (14)	U
3̸	5̸	2
− 1	5	6
1	9	6

Number of visits to the museum

1st
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
11th
12th
13th
14th
15th
16th
17th
18th
19th
20th

Ordinal numbers

The ordinal numbers are used to indicate a certain order or position.

Each ordinal number corresponds to a cardinal number.

1st	first	11th	eleventh
2nd	second	12th	twelfth
3rd	third	13th	thirteenth
4th	fourth	14th	fourteenth
5th	fifth	15th	fifteenth
6th	sixth	16th	sixteenth
7th	seventh	17th	seventeenth
8th	eigth	18th	eighteenth
9th	ninth	19th	nineteenth
10th	tenth	20th	twentieth

Here are some more:

20th	twentieth
21st	twenty-first
22nd	twenty-second
30th	thirtieth
31st	thirty-first
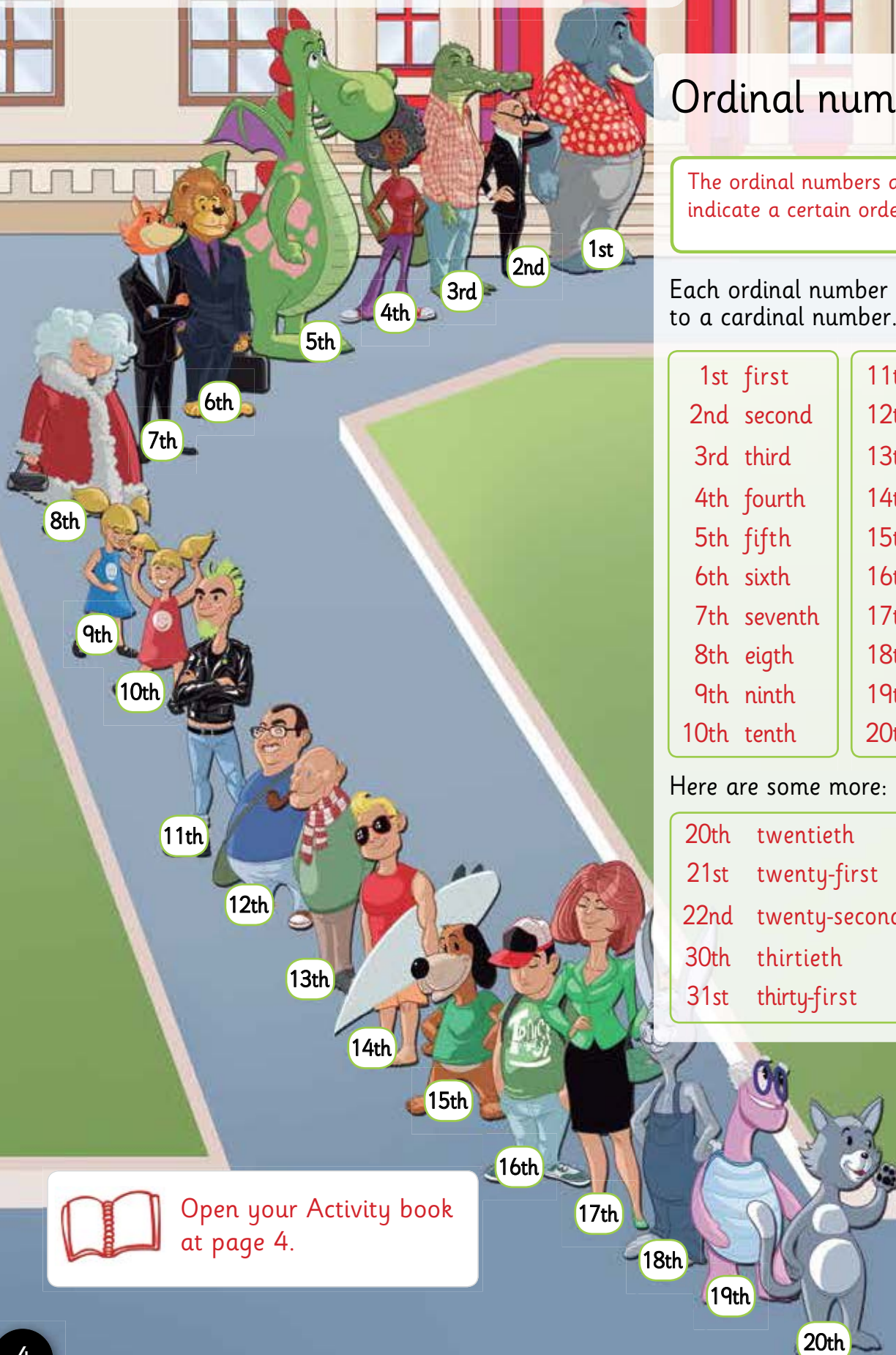
Open your Activity book at page 4.

4

Three-digit numbers

Green Dragon has bought 10 packets of photos.
Each packet contains 10 photographs of museum paintings.
How many photos are there in total?
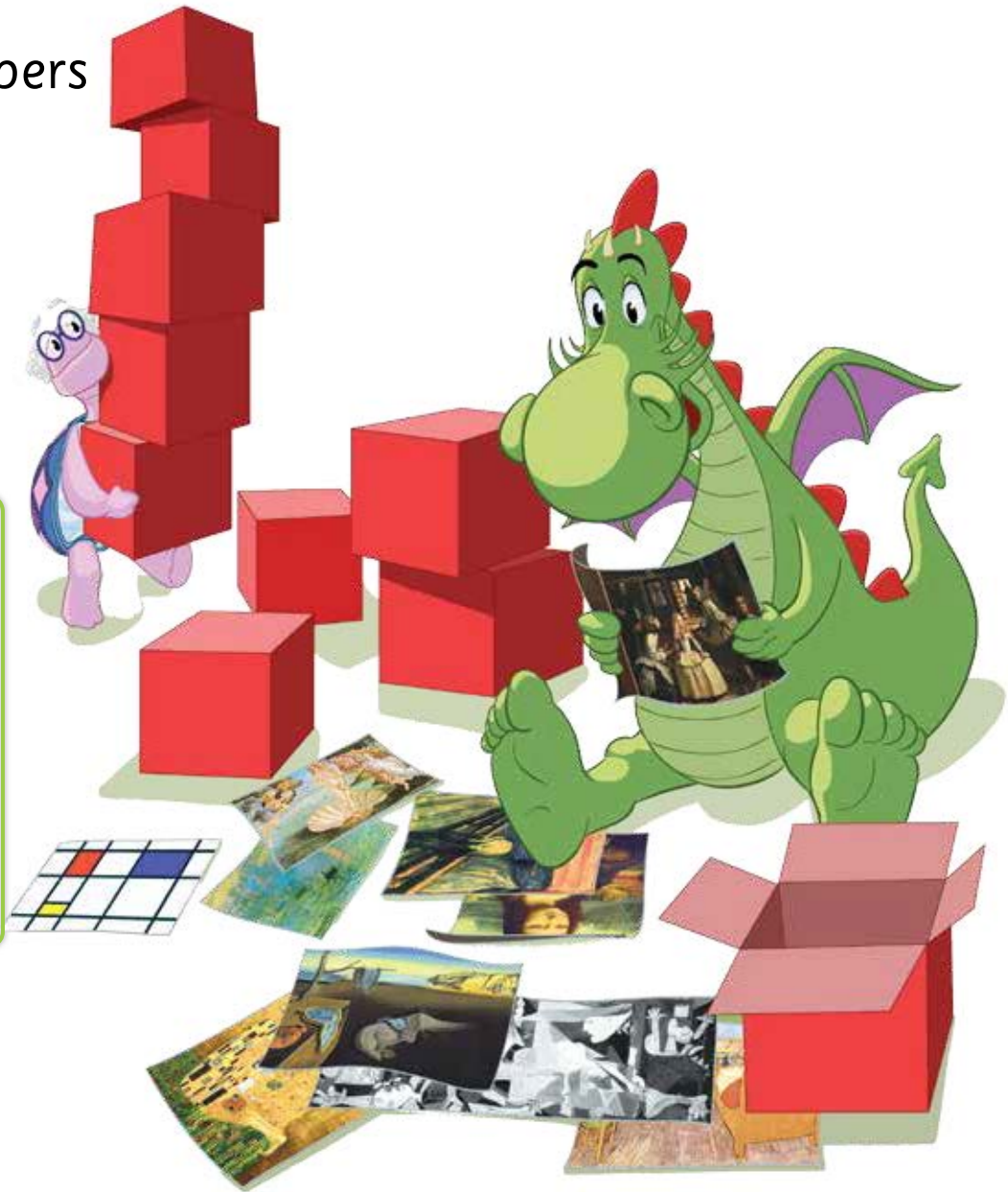
10 tens = 1 hundred

Hundreds	Tens	Units
1	0	0

1H = 10T = 100U

Three-figure numbers are made up of hundreds, tens and units.

Hundreds	Tens	Units
3	2	7
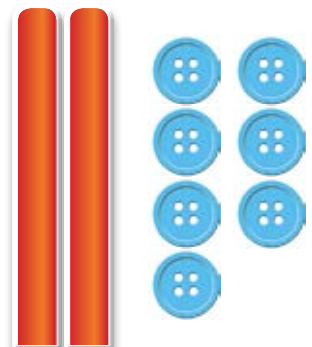
327 = 3 H + 2 T + 7 U
327 = 300 + 20 + 7
327 is read: three hundred and twenty-seven.

Open your Activity book at pages 5-6.

Comparing three-digit numbers

Bigger or smaller?

First we compare the hundreds. The bigger number is the one with the most hundreds.

H	T	U
6	5	7
3	8	9

6 > 3

657 > 389

If the numbers in the hundreds column are the same, we compare the numbers in the tens column.

H	T	U
6	5	7
6	8	9

8 > 5

689 > 657

When we compare two numbers and see that one of them has fewer digits than the other, we know that it's the smaller number.

H	T	U
	7	9
1	0	4

104 > 79

Remember

>	<	=
greater than	less than	equal to

Open your Activity book at page 7.

Rounding off three-digit numbers

To round off a number to the nearest ten, we must see which tens it is situated between and then choose the one which is closer.

6T ←——————————————————————→ 7T

59 60 61 62 63 64 65 66 67 68 69 70 71
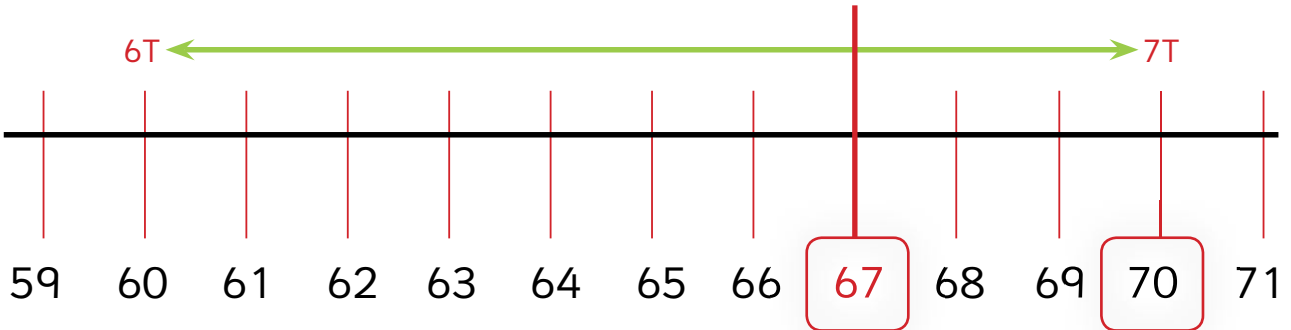
67 is closer to 70 than 60.

To round off a number to the nearest hundred, we must see which hundreds it is situated between and then choose the one which is closer.

3H ←——————————————————————→ 4H

290 300 310 320 330 340 350 360 370 380 390 400 410

332
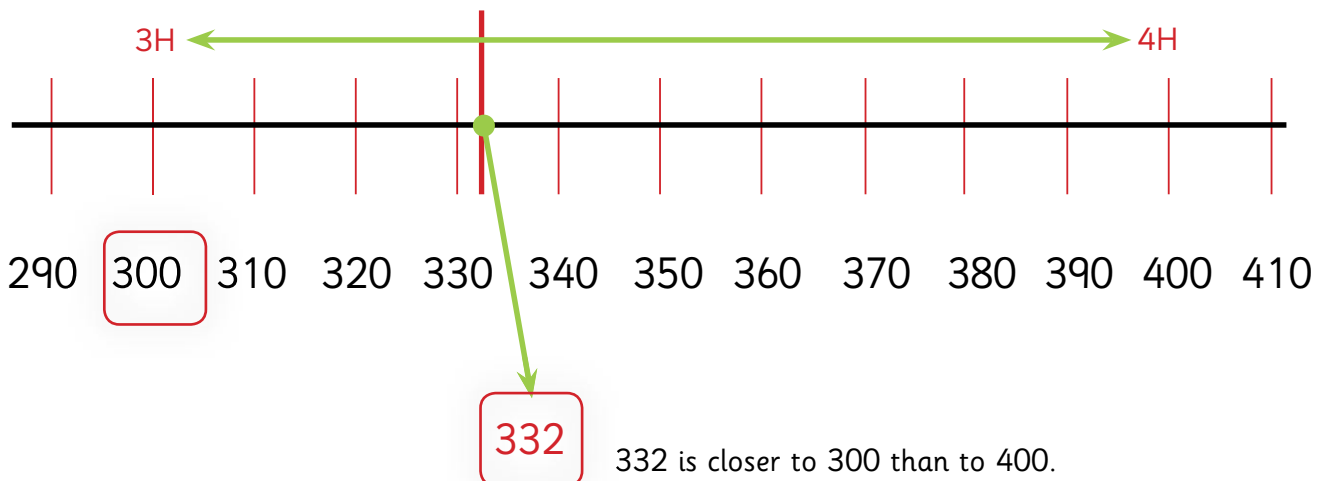
332 is closer to 300 than to 400.

Open your Activity book at page 8.

Remember

Ordinal numbers

Ordinal numbers indicate a certain order or position.

1st	first	11th	eleventh
2nd	second	12th	twelfth
3rd	third	13th	thirteenth
4th	fourth	14th	fourteenth
5th	fifth	15th	fifteenth
6th	sixth	16th	sixteenth
7th	seventh	17th	seventeenth
8th	eigth	18th	eighteenth
9th	ninth	19th	nineteenth
10th	tenth	20th	twentieth

Three-digit numbers

Hundreds	Tens	Units
3	0	0

1H = 10T = 100U

3H = 30T = 300U

Comparing numbers

Hundreds	Tens	Units
4	6	2
1	9	6

4 > 1

462 > 196

Rounding off numbers

3H ←————————————→ 4H

290 300 310 320 330 340 350 360 370 380 390 400 410
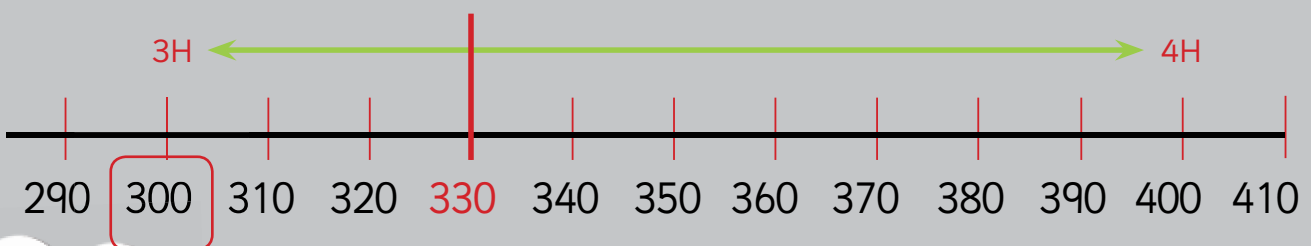
Group offers

Multiplication

Multiplication is like adding the same number several times.

3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 = 24
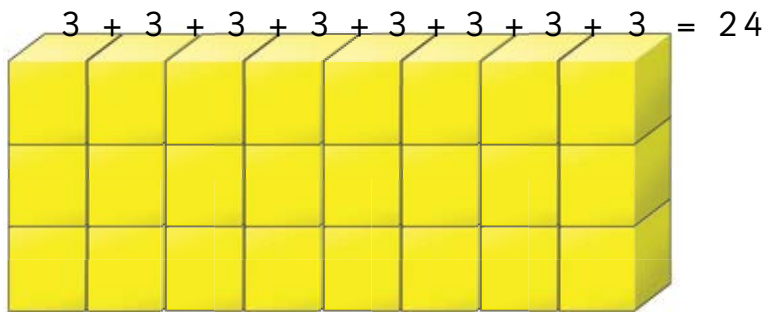
| Multiplication | ✕ |

8 → Multiple

x 3 → Multiplier

24 → Product

Multiplication properties

Commutative
The order of the factors doesn't change the product.

$$2 \times 3 = 3 \times 2$$

Associative
The way the factors are put into groups doesn't change the result.

$$(3 \times 2) \times 5 = 3 \times (2 \times 5)$$
$$6 \times 5 = 3 \times 10$$
$$30 = 30$$

Distributive
If we multiply a number by an addition, it's the same as if we multiply each addend of the addition.

$$2 \times (3 + 5) = 2 \times 3 + 2 \times 5$$
$$2 \times 8 = 6 + 10$$
$$16 = 16$$

Removing common factor
If several addends have a common factor, we can transform the addition into a product, removing the common factor.

$$(2 \times 7) + (3 \times 7) = 7 \times (2 + 3)$$
$$14 + 21 = 7 \times 5$$
$$35 = 35$$

Two-digit numbers multiplication without carrying over

1st The units are multiplied by the multiplier and the product is written underneath the line.

Tens	Units
2	4
x	2
	8
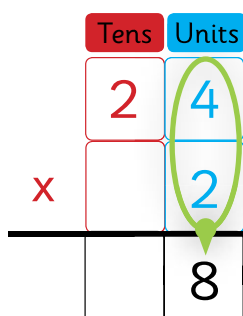
2nd The tens are multiplied by the multiplier and the product is writen underneath the line.
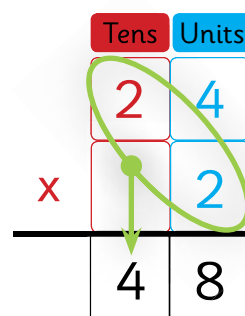
Tens	Units
2	4
x	2
4	8

Open your Activity book at pages 11-12.

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Two-digit numbers multiplication with carrying over

1st
We multiply the units by two (9 x 2 = 18). We write the 8 under the line and carry over the 1 to add it to the product of the next multiplication.

Tens	Units
8	9
x	2
	¹8

2nd
We multiply the tens by two (8 x 2 = 16) and add the 1 we carried over from the previous operation (16 + 1 = 17). We write 7 under the line and add the 1 to the hundreds column.

Tens	Units
¹8	6
x	2
1 7	2

Three-digit numbers multiplication with carrying over

1st
We multiply the units by two (6 x 2 = 12). We write 2 under the line and carry over the 1 from the tens column to add it to the product of the next operation.

H	T	U
4	⁺¹8	6
		2
x		¹2

2nd
We multiply the tens by two (8 x 2 = 16) and add the 1 we carried over from the previous operation (16 + 1 = 17). We write 7 under the line and carry over the 1 to add it to the product of the next operation.

H	T	U
⁺¹4	8	6
x		2
¹7	2	

3rd
We multiply the hundreds by two (4 x 2 = 8) and add the 1 carried over from the previous operation (8 + 1 = 9). We write 9 under the line and the multiplication is complete.

H	T	U
4	8	6
x		2
9	7	2

Open your Activity book at page 13.

Division

Division is sharing out in equal parts or groups.
Division is the opposite of multiplication.

Take your buttons and do the division shown below.

| Division | ÷ | ⌐ |

12 ÷ 4 = 3

12 ÷ 4 = 3

12 ÷ 4 = 3

12 ÷ 4 = 3

Division terms

| Dividend: Amount to share out. | Divisor: Number of parts it's divided into. | Quotient: The result of the division. | Remainder: Amount that remains or that's left over. |

Dividend

Divisor

Remainder

Quotient

16 ⌐2
0   8
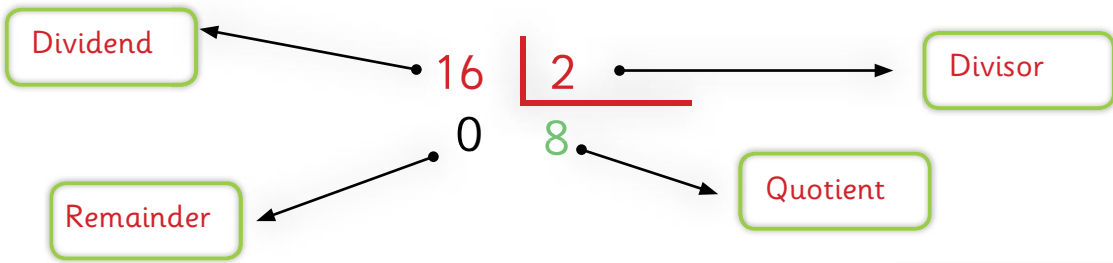
The division test

divisor	x	quotient	+	remainder	=	dividend
2	x	8	+	0	=	16

Open your Activity book at page 14.

11

Traditional division

1st We look for a number that, when multiplied by 2, gives us a result of 16.

$$2 \times 6 = 12$$
$$2 \times 7 = 14$$
$$2 \times 8 = 16$$

The quotient is 8.

2nd We write the quotient and place the product under the dividend.

```
16 | 2
16   8
```

3nd We subtract the product from the dividend.

```
 16  | 2
- 16   8
  0
```

The remainder is 0.

When the remainder is 0, the division is exact.
When the remainder is different from 0, the division is called an integer division.

Division using breakdown

This is a division which is split into several parts:

$$36 \div 3 = 12$$

```
30 6 | 3
- 30   10 + 2
 0 +6
  - 6
   0
```

$$156 \div 3 = 52$$

```
100 50 6 | 3
- 90      30 + 20 + 2
10+50
  60
- 60
  0 +6
   - 6
    0
```

Multiplying by 10, 100, 1 000

$$5 \times 1\,0 = 5\,0 \qquad 3 \times 1\,00 = 3\,00 \qquad 2 \times 1\,000 = 2\,000$$

Open your Activity book at page 15.

Remember

Multiplication terms
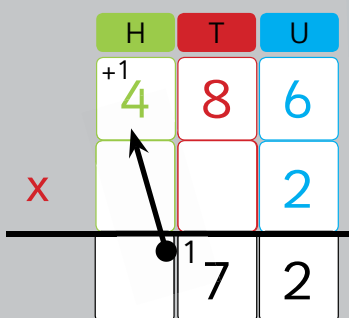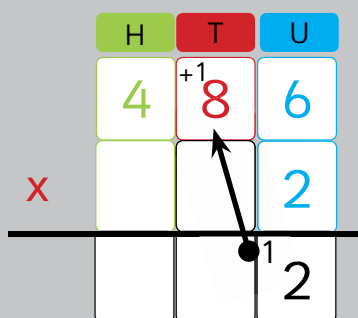
	H	T	U
	4	+1 8	6
x			2
			1 2

	H	T	U
	+1 4	8	6
x			2
		1 7	2

|	H	T	U
	4	8	6
x			2
	9	7	2

Division terms

Dividend:
Amount to share out.

Divisor:
Number of parts it's divided into.

Quotient:
The result of the division.

Remainder:
Amount that remains or that's left over.

Dividend → 16 | 2 ← Divisor

0   8

Remainder ← 0

8 → Quotient
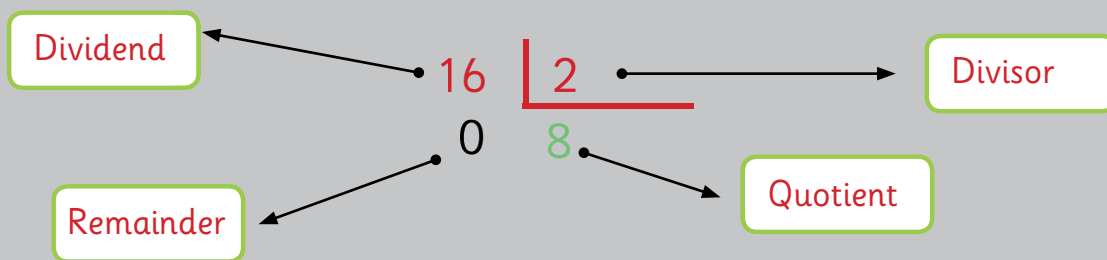
Division is the opposite of multiplication.

$$4 \times 6 = 24$$
$$24 \div 4 = 6$$

x / ÷	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	64	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

13

Guernica and the Mona Lisa

Length measurement
The metre

It's much longer than 1 metre.

The metre is the main unit for measuring length.

It's much shorter than 1 metre.

Mona Lisa
Leonardo da Vinci
1503 – 1519

14

Multiples and submultiples of the metre

To measure objects or distances that are shorter than a metre, we use smaller units. These are called submultiples.

Decimetre (dm)
If 1 metre is divided into 10 equal parts, each part is a decimetre.

1 m = 10 dm

Centimetre (cm)
If we divide a decimetre into 10 equal parts, each part is a centimetre.

1 m = 100 cm

Millimetre (mm)
If we divide a centimetre into 10 equal parts, each part is a millimetre.

1 m = 1 000 mm

To measure big objects or large distances, we use measuring units that are larger than a metre. These are called multiples.

Decametre (dam)
One decametre is 10 metres.

1 dam = 10 m

Hectometre (hm)
One hectometre is 100 metres.

1 hm = 100 m

Kilometre (km)
One kilometre is 1 000 metres.

1 km = 1 000 m

Open your Activity book at pages 18-19.

Equivalences between units of length

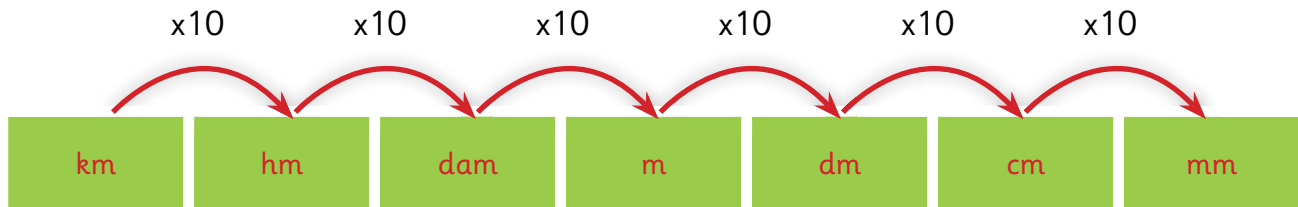|		
1 metre is equivalent to 1 000 mm	1 metre is equivalent to 100 cm	1 metre is equivalent to 10 dm
1 dam is equivalent to 10 m	1 hm is equivalent to 100 m	1 km is equivalent to 1 000 m

To convert one unit of length to another, we can use the following diagram:

x10   x10   x10   x10   x10   x10

| km | hm | dam | m | dm | cm | mm |

To convert metres to decimetres, centimetres or millimetres, multiply by 10, 100, and 1 000 respectively.

Length in metres	Multiply by 10 for decimetres.	Multiply by 100 for centimetres.	Multiply by 1 000 for millimetres.
1	10	100	1 000
3	30	300	3000
10	100	1 000	10 000

| Length in kilometres	Multiply by 10 for hectometres	Multiply by 100 for decametres	Multiply by 1 000 for metres
5	50	500	5000
6	60	600	6000
10	100	1 000	10 000

Open your Activity book at page 20.

Adding and subtracting units of length

To add and subtract different measurements of length, we must make sure that all the measurements are using the same units. So, for example, we must add metres to metres and centimetres to centimetres, or subtract metres from metres and centimetres from centimetres.

Here is the blueprint of the museum. It is 12 metres and 70 centimetres long. What is its length in centimetres?

1st
We convert the metres into centimetres:
12 m x 100 = 1 200 cm

2nd
We add centimetres and centimetres:
1 200 cm + 70 cm = 1 270 cm

12m 70cm = 1 270 cm
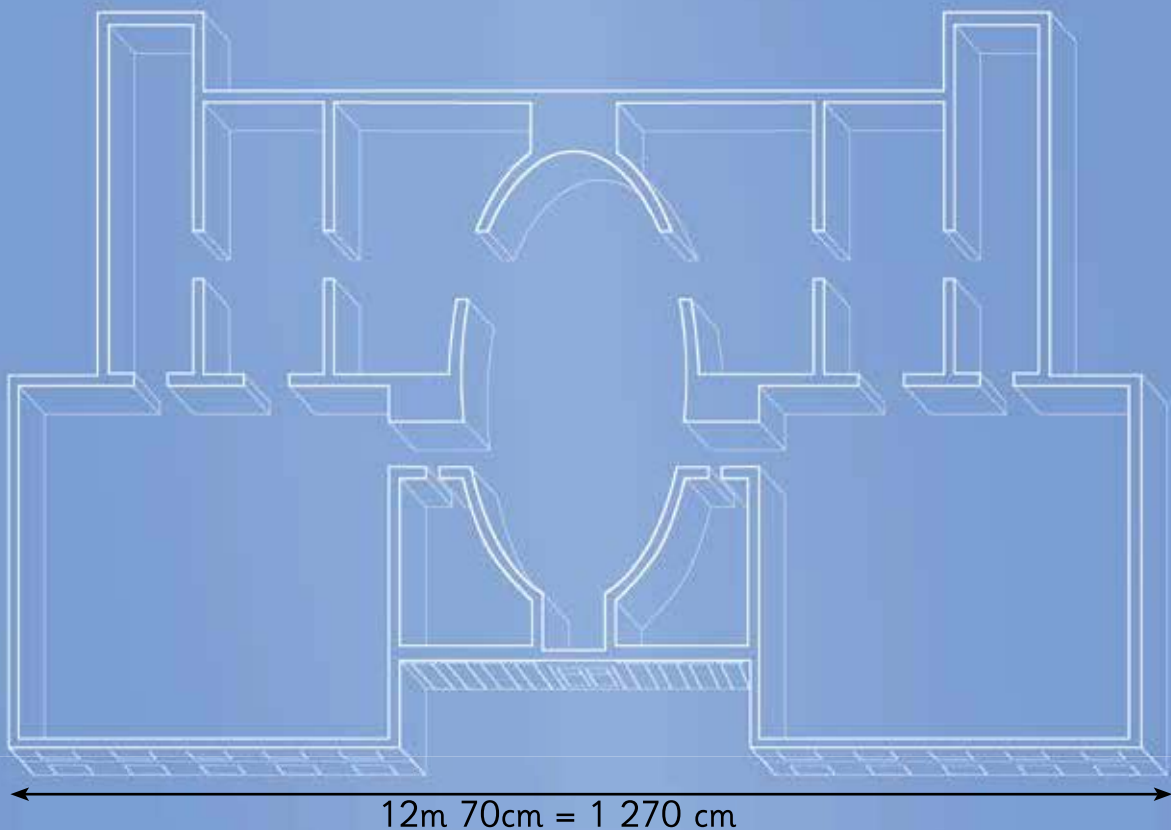
Remember

Length measurement
Metres

• Metre
The metre is the main unit for measuring length.

• Submultiples of the metre
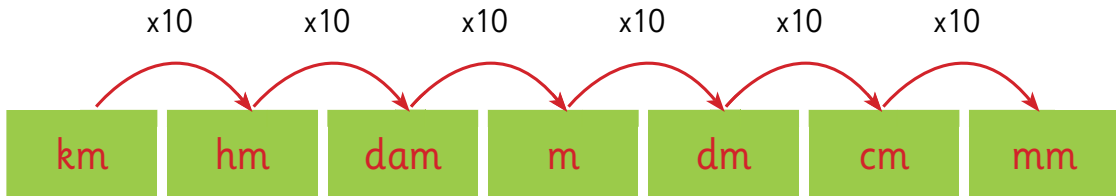We use these to measure lengths that are shorter than a metre: decimetre (dm), centimetre (cm) and millimetre (mm).

1 m = 10 dm = 100 cm = 1 000 mm

• Multiples of the metre
We use these to measure distances that are longer than a metre: decametre (dam), hectometre (hm) and kilometre (km).

1 km = 10 hm = 100 dam = 1 000 m

x10	x10	x10	x10	x10	x10

km	hm	dam	m	dm	cm	mm

Add and subtract units of length

To add and subtract different measurements of length, we must convert all the measurements to the same units.

Addition

(8 dam 35 m) + (5 hm 7 m)

=

(80 m + 35 m) + (500 m + 7 m)

=

115 m + 507 m = ⟨ 622 m ⟩

Subtraction

(3 Km 1 dam) - (9 hm 6 dam)

=

(3 000 m + 10 m) - (900 m + 60 m)

=

3010 m - 960 m = ⟨ 2 050m ⟩

Maths

Pupil's Book

Contents

Welcome back!

Showing numbers as rectangles

Some numbers can be represented as a series of columns that form a rectangle. Other numbers can't be shown in this way because they don't form exactly matching columns.
Let's look at the numbers from 1 to 10.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
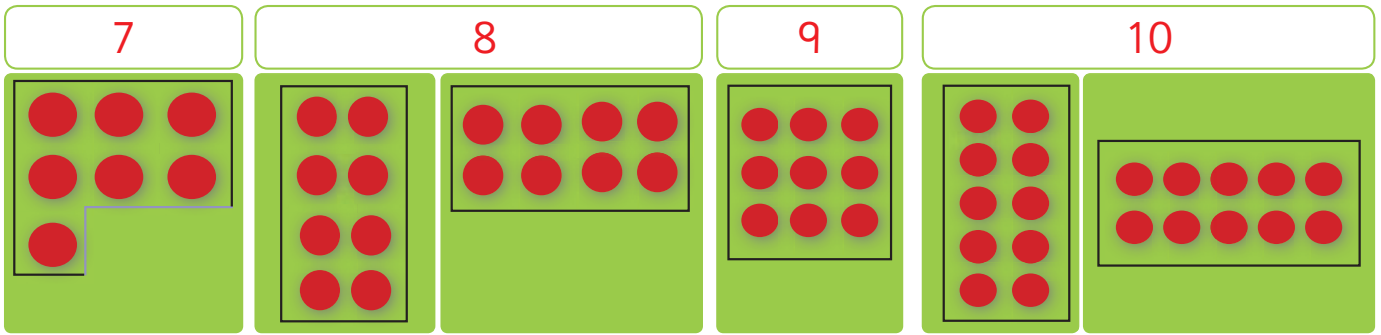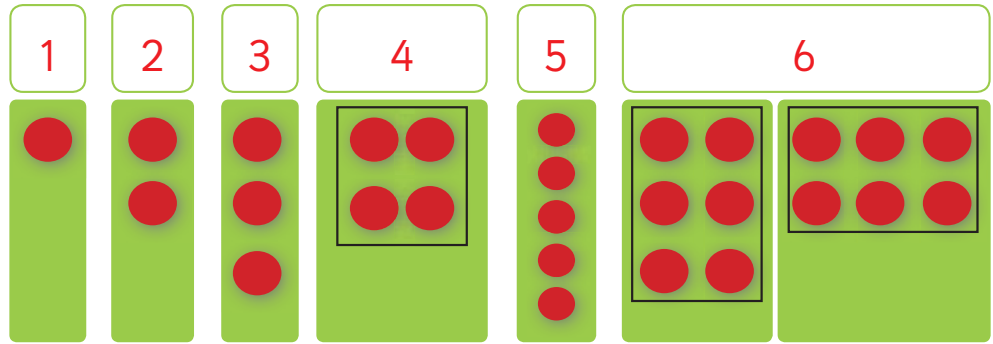
Numbers that can't be put into several columns of exactly the same length are called prime numbers.

5
Prime number

	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
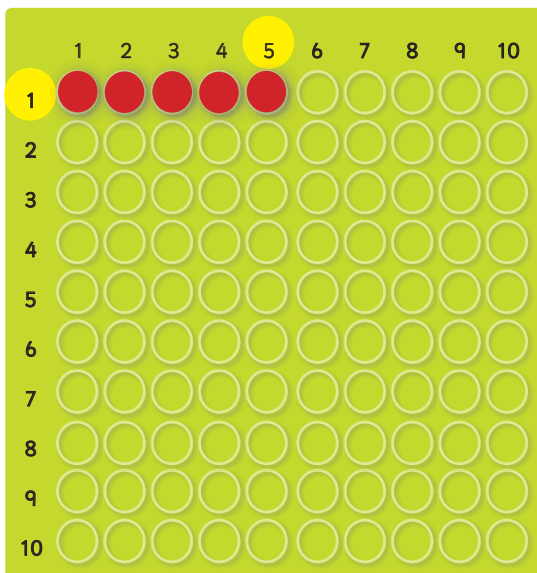
Numbers that can be shown as rectangles with more than one column are called composite numbers.

8
Composite number

	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
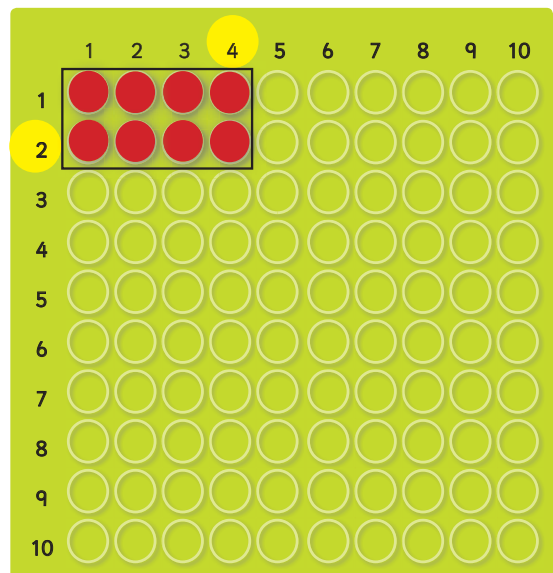
17 Prime number
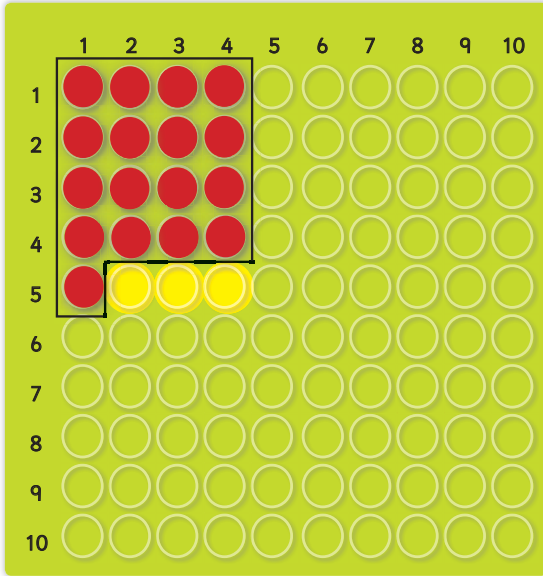
21 Composite number
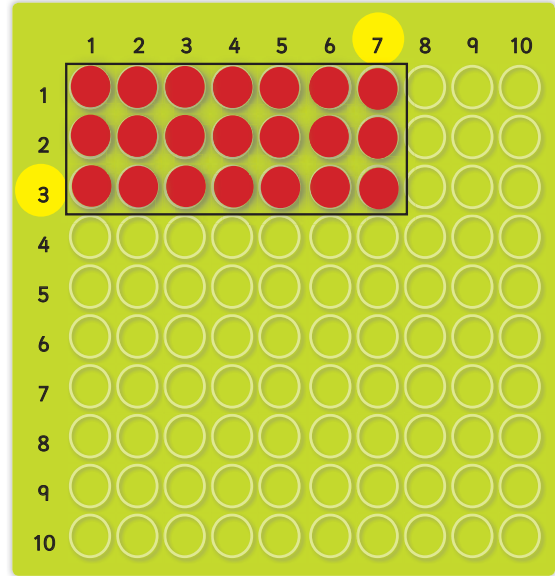
The product rule

A number can be written as a product of two factors.

$$6 \times 3 = 18 = 3 \times 6$$
$$9 \times 2 = 18 = 2 \times 9$$

The order of the factors can be changed but the number remains the same.

Different rectangular patterns can be made in accordance with the product rule.
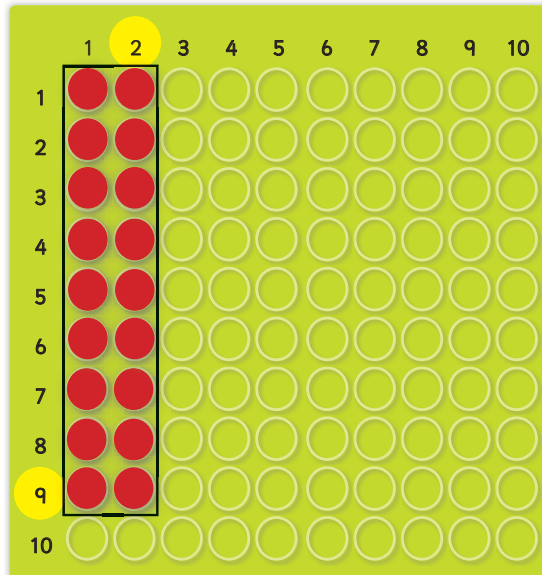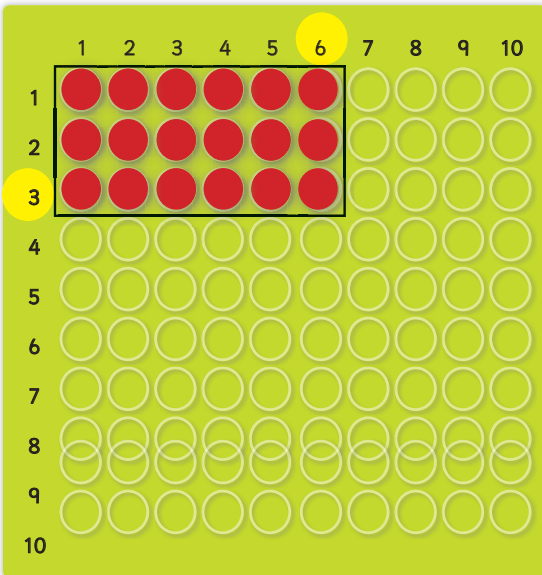
Sky

What numbers can we see?

13 600 m

11 800 m

10 400 m

9 200 m

7 200 m

6 168 m — Mt. Denali

-60°

5 600 m

4 300 m

3 000 m

1 500 m

+18
+16
+14
+12
+10
+8
+6
+4
+2
0°C
-2
-4
-6
-8
-10
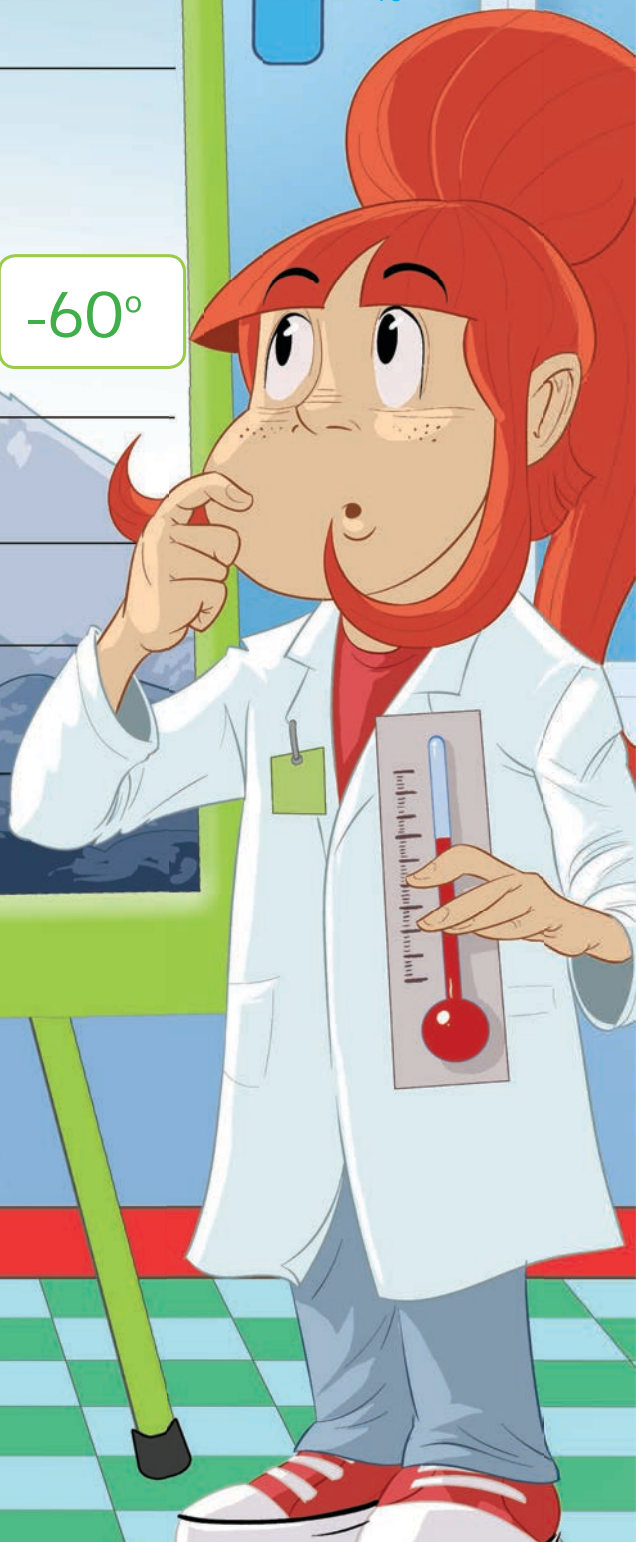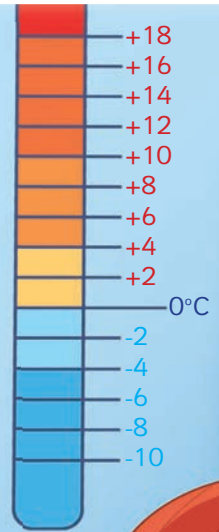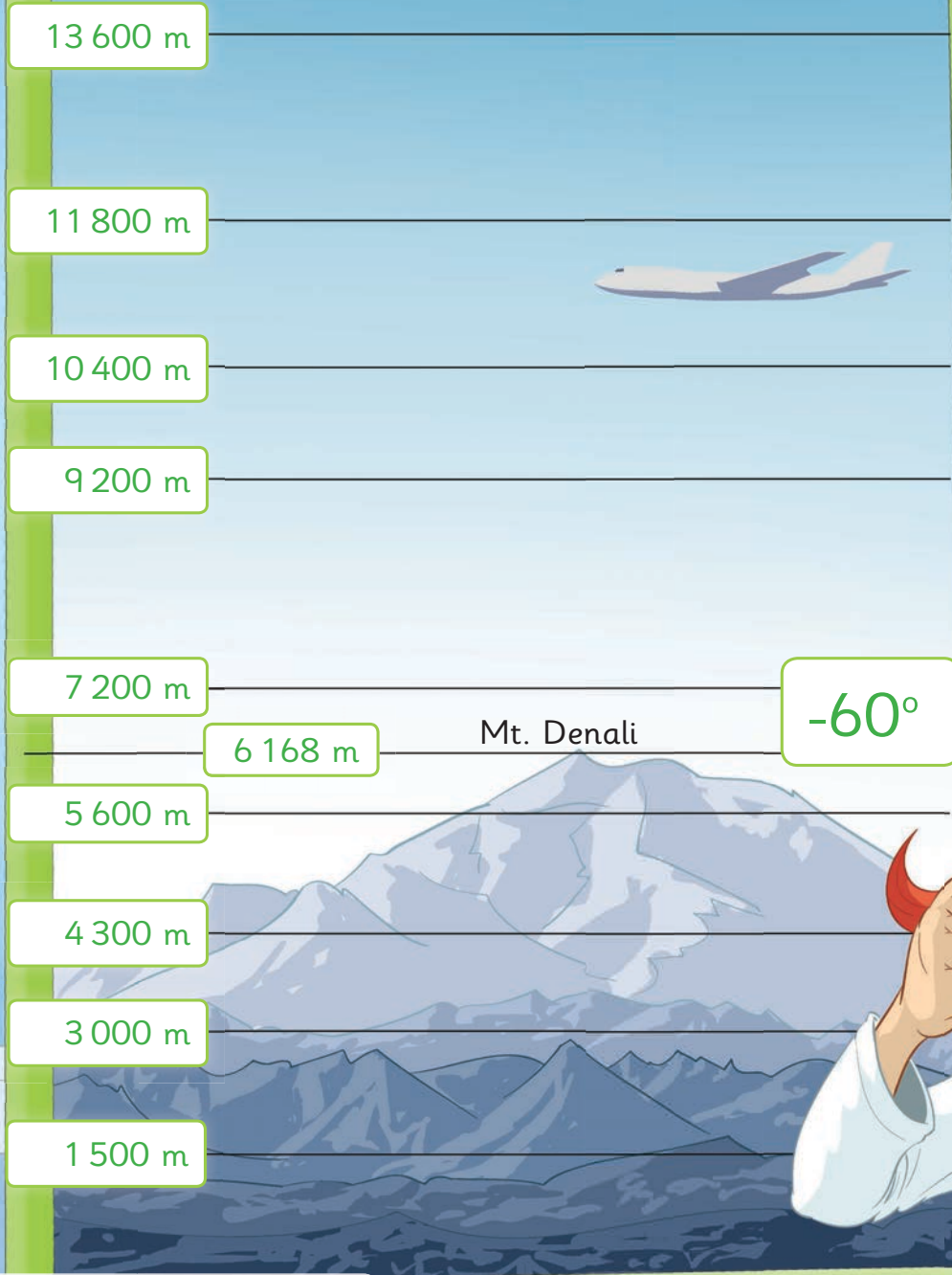
Mount Denali is the highest mountain in North America. It is 6 168 metres above sea level.

4

Natural numbers

Numbers of up to twelve figures. Place value.

Do they have the same properties as smaller numbers?

123 456 789 012

123 456 789 012

We can place them like smaller numbers.

Billions			Millons			Thousand			Hundreds		
H	T	U	H	T	U	H	T	U	H	T	U
1	2	3	4	5	6	7	8	9	0	1	2

We can break them down into their additive form as well as their additive/multiplicative form.

123 456 789 012 =

100 000 000 000 + 20 000 000 000 +

3 000 000 000 + 400 000 000 + 50 000 000 + 6 000 000 +

700 000 + 80 000 + 9 000 + 10 + 2 =

1 × 100 000 000 000 + 2 × 10 000 000 000 + 3 × 1 000 000 000

+ 4 × 100 000 000 + 5 × 10 000 000 + 6 × 1 000 000 +

7 × 100 000 + 8 × 10 000 + 9 × 1 000 + 1 × 10 + 2

How do we read big numbers?

491564598213

First, put the figures in the big number into groups of three, like this:

491564598213

491 564 598 213

Four hundred and ninety-one billion, five hundred and sixty-four million, five hundred and ninety-eight thousand, two hundred and thirteen.

Second, leave a space in between the groups.

491 564 598 213

Now we are ready to read a twelve-figure number.

491 564 598 213

billion   millon   thousand

Open your Activity book at pages 4-5.

Rounding off

Rounding off to the nearest ten

8 6 7

7 > 5

8 6 7

+ 1T

6 + 1 = 7

8 7 0

Rounded off

8 6 2

2 < 5

4 6 2

+ 0T

6 + 0 = 6

8 6 0

Rounded off

To the nearest hundred

8 6 7

6 > 5

8 6 7

+ 1H

8 + 1 = 9

9 0 0

Rounded off

8 4 3

4 < 5

8 4 3

+ 0 H

8 + 0 = 8

8 0 0

Rounded off

To the nearest thousand

1 7 5 3	1 2 5 6	1 5 8 8
7 > 5	2 < 5	5 < 5
1 7 5 3	1 2 5 6	1 5 8 8
+ 1Th	+ 0Th	+ 1Th
1 + 1 = 2	1 + 0 = 1	1 + 1 = 2
2 0 0 0	1 0 0 0	2 0 0 0
Rounded off	Rounded off	Rounded off

To the nearest million

2 9 6 5 3 5 6	3 1 2 5 3 5 4	3 5 5 6 3 5 4
9 > 5	1 < 5	5 = 5
2 9 6 5 3 5 6	3 1 2 5 3 5 4	3 5 5 6 3 5 4
+ 1Million	+ 0 Million	+ 1 Million
2 + 1 = 3	3 + 0 = 3	3 + 1 = 4
3 0 0 0 0 0 0	3 0 0 0 0 0 0	4 0 0 0 0 0 0
Rounded off	Rounded off	Rounded off

Open your Activity book at page 6.

Combined operations

ORDER

1° Calculate the operations in brackets
$$5+12 \div (5-1) = 8$$

2° Calculate the multiplications and divisions in the order they appear
$$(25 \div 5) - (6 \div 3) + (2 \times 3) = 9$$

3° Calculate the additions and subtractions in the order they appear

Which operation should I do first if I want to do an additive/multiplicative breakdown of a number?

Order

1st	**2nd**	**3rd**
Do the calculations in brackets.	Do the multiplications and divisions in the order they appear.	Do the additions and subtractions in the order they appear.

$$5 + 12 \div (5 - 1) =$$

$$5 + 12 \div 4 =$$

$$5 + 3 =$$

$$8$$

$$(25 \div 5) - (6 \div 3) + (2 \times 3) =$$

$$5 - 2 + 6 =$$

$$3 + 6 =$$

$$9$$

📖 Open your Activity book at page 7.

Remember

Place value

Billions			Millons			Thousands			Hundreds		
H	T	U	H	T	U	H	T	U	H	T	U
1	2	3	4	5	6	7	8	9	0	1	2

Natural numbers N

Breakdown

523
$$500 + 20 + 3 = 5 \times 100 + 2 \times 10 + 3$$

Additive

Additive/ multiplicative

Rounding off

If the number is
< 5
●━━→ + 0

If the number is
> 5
●━━→ + 1

If the number is
= 5
●━━→ + 1

Combined operations

Order

1st
Do the calculations in brackets.

2nd
Do the multiplications and divisions in the order they appear.

3rd
Do the additions and subtractions in the order they appear.

Land

Guadalajara, Mexico 9 360 km

Irkutsk, Russia 7 523 km

Republic of Madagascar 9 250 km

Buenos Aires, Argentina 10 077 km

What numbers can we see?

Spring

+18
+16
+14
+12
+10
+8
+6
+4
+2
0°C
-2
-4
-6
-8
-10

Madrid, Spain 22°C ← 9 360 km. → Guadalajara, Mexico 25°C

Republic of Madagascar. 9 250 km. 19°C

Irkutsk, Russia. 3 402 km. -1°C

Buenos Aires, Argentina. 10 077 km. -7°C

10
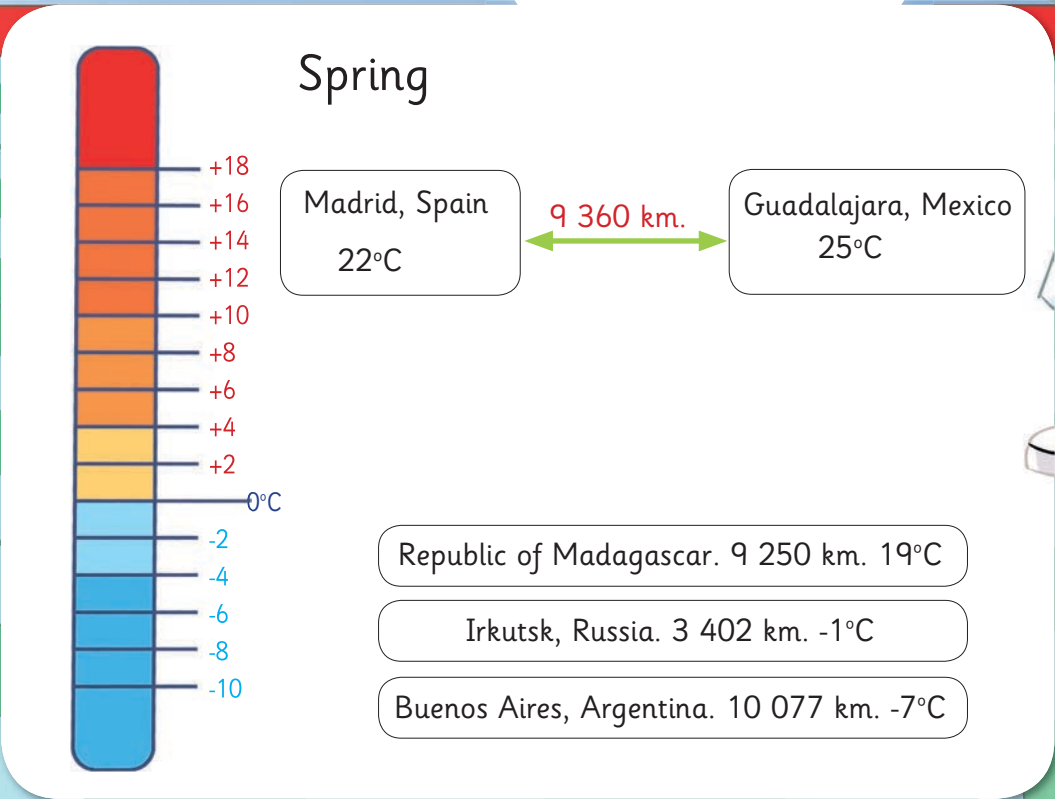
Integers

We measure the temperature during a whole day, with its highest and lowest points.
If the temperature in my city is -2° C at 7 am and +4° C at 1:00 pm, how many degrees has it risen?
It's risen by 6° C.

Natural numbers (sometimes called positive integers) are all the numbers formed with the digits from 0 to 9.

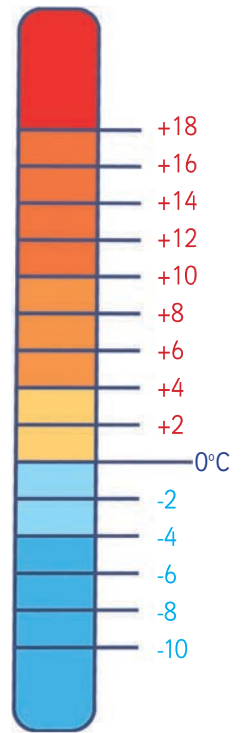| **N** Natural numbers | All positive whole numbers. |

N = 0, 1, 2, 3, 4, 5...

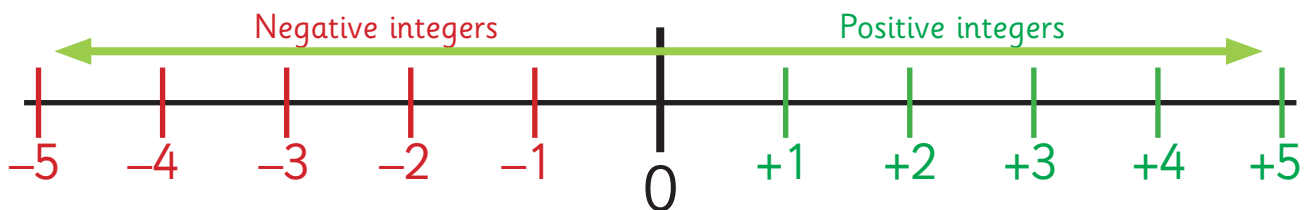If the minuend is lower than the subtrahend, we must use integers (Z) to express the difference.

| **Z** Integers | All the natural numbers, including zero, and their opposites. |

+18
+16
+14
+12
+10
+8
+6
+4
+2
0°C
-2
-4
-6
-8
-10

Integers consist of all the natural numbers, their opposites and zero.

Z = ..., -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, ...

N ε Z

Negative integers   Positive integers

−5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5

Opposite numbers and absolute value

The absolute value of a number

$$|5| = +5$$
$$|5| = -5$$

The opposite of a number

$$-5 \longrightarrow +5$$
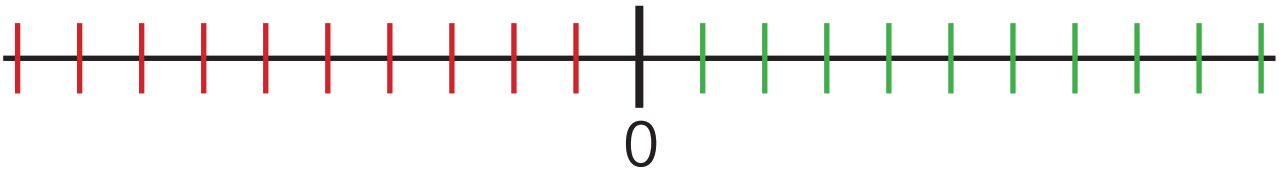$$+5 \longrightarrow -5$$

Open your Activity book at page 10.

The order of integers

To put integers in order, we need to follow these steps.
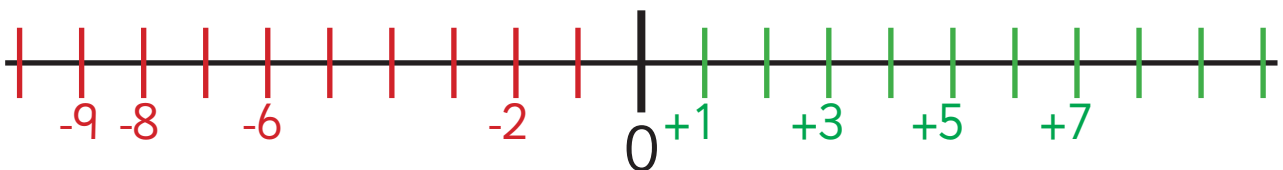
1st step

We draw a number line.

0

2nd step

Now we find the correct position for each number.

-6, +7, -9, +3, +1, -2, +5, -8

Negative numbers go on the left of the zero: -6, -9, -2, -8.

Positive numbers go on the right of the zero: +7, +3, +1, +5.

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

The bigger the negative number is, the farther away it is from the zero.

Open your Activity book at page 11.

Cartesian coordinates

This is a system based on two lines (or axes) which cross each other. They are perpendicular to each other. The place where they intersect is called the origin of the coordinates.

To the right of the origin of the coordinates on the X axis, values are positive. To the left, they are negative. Similarly, on the Y axis, values are positive above the origin and negative below it.
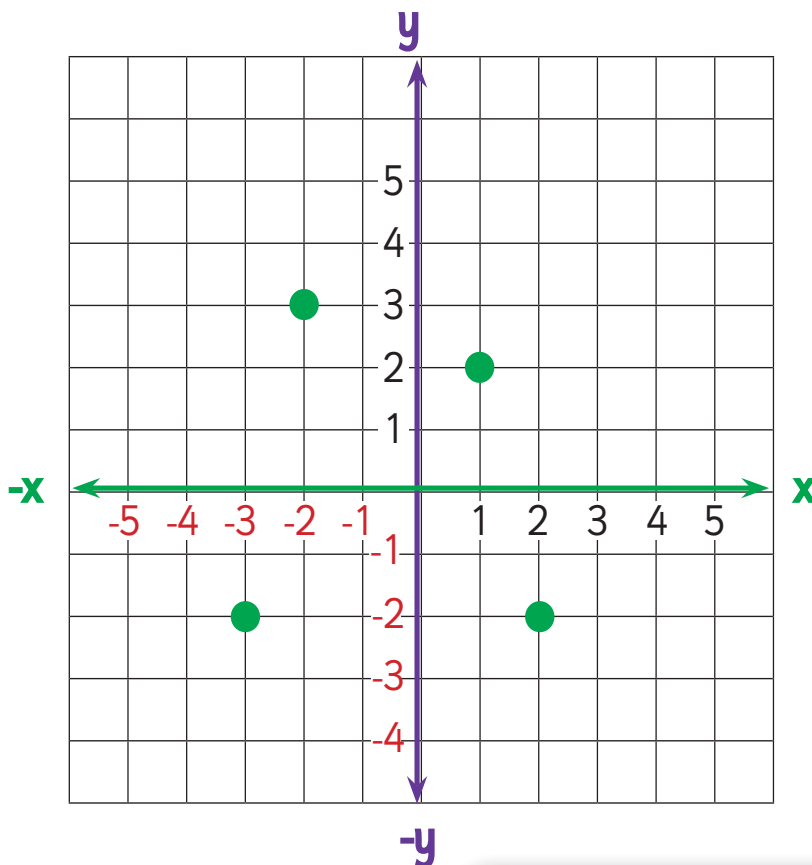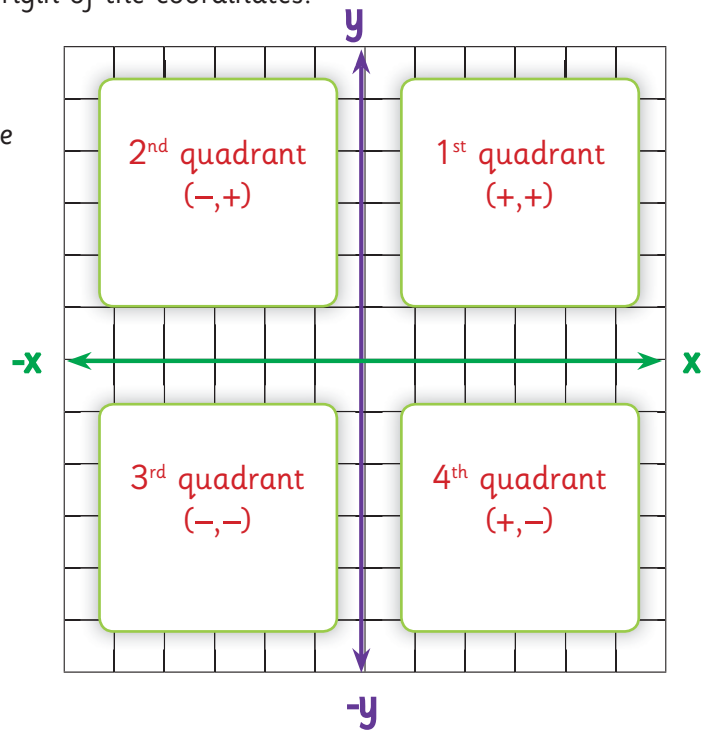
The two axes divide the plane into four quadrants ordered as follows:

First quadrant:
above the x axis, to the right of the y axis. (+;+)

Second quadrant:
above the x axis, to the left of the y axis. (−;+)

Third quadrant:
below the x axis, to the left of the y axis. (−;−)

Fourth quadrant:
below the x axis, to the right of the y axis. (+;−)

2nd quadrant (−,+)
1st quadrant (+,+)
3rd quadrant (−,−)
4th quadrant (+,−)

1st (1,2)

First we look for 1 on the X axis and then for 2 on the Y axis. We mark a dot on the grid.

2nd (-2,3)

We look for -2 on the -X axis and then the 3 on the Y axis. We mark a dot on the grid.

3rd (-3,-2)

We look for -3 on the -X axis and then -2 on the -Y axis. We mark a dot on the grid.
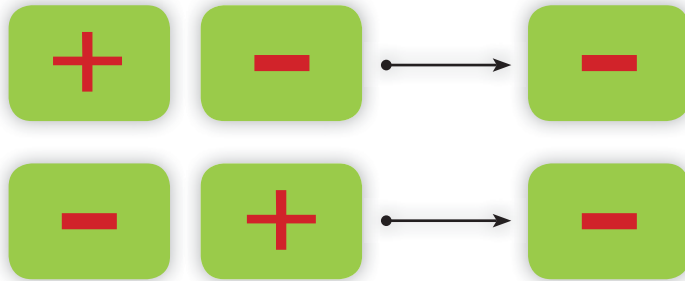
4th (2,-2)

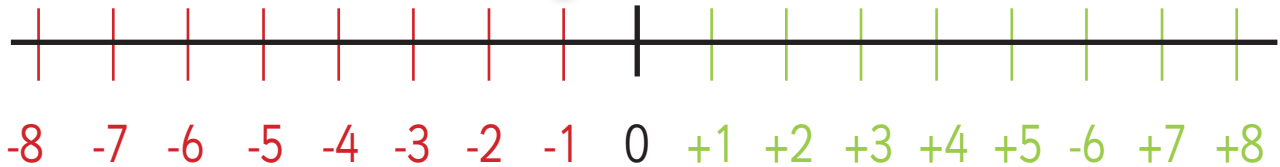We look for 2 on the X axis. and then -2 on the -Y. We mark a dot on the grid.

Open your Activity book at page 12.

Adding and subtracting integers

To add and subtract with positive
and negative numbers:

$(+2) + (-3) =$

-3

+2

-1

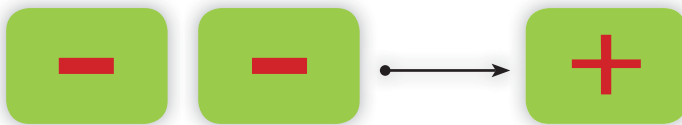-8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 -6 +7 +8

We move the number of spaces of the positive integer to the right: 2 right.
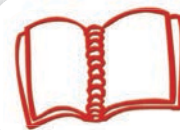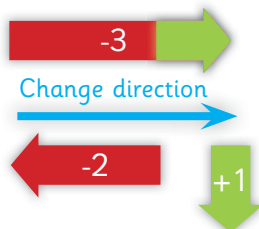We move the number of spaces of the negative integer to the left: 3 left.
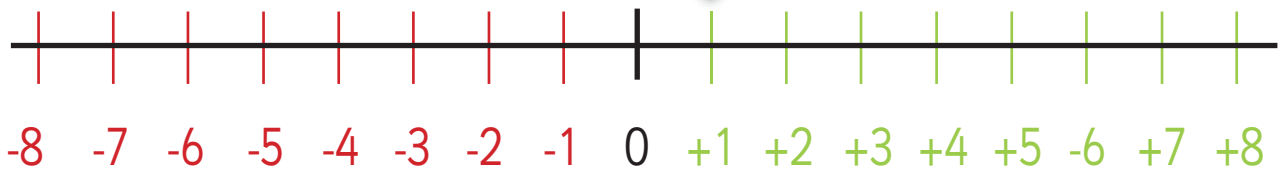
$(+2) + (-3) = (-1)$

Subtracting with negative numbers:

We look at the symbols and move
to the right (+) or to the left (−).

$(-2) - (-3) =$

-3

Change direction

-2

+1

Open your Activity
book at page 13.

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

$(-2) - (-3) = +1$

Remember

Integers

N Ɛ Z

N Natural numbers — All positive whole numbers.

N = 0, 1, 2 ,3 ,4 ,5...

Z Integers numbers — All the natural numbers, their opposite and zero.

Z = ... -3, -2, -1, 0, +1, +2, +3 ...

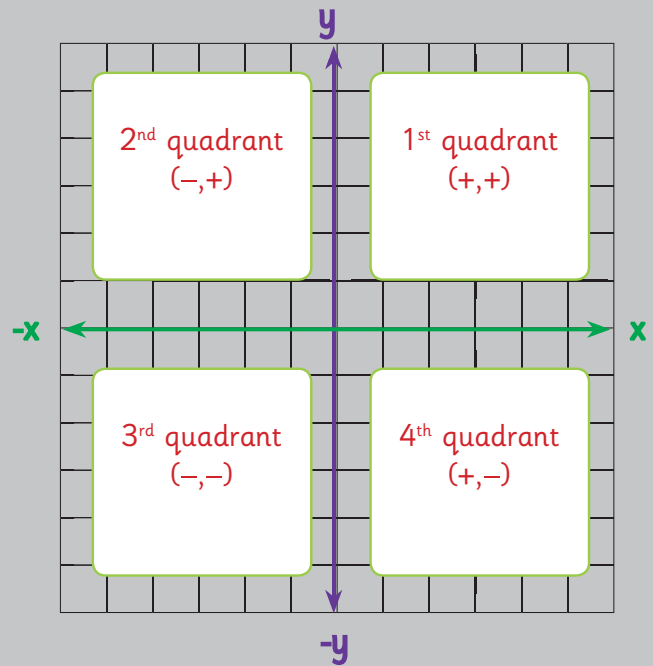## Rounding off
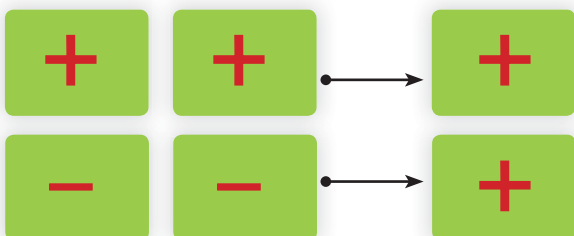
If the number is < 5 ↦ +0

If the number is >5 ↦ +1

If the number is = 5 ↦ +1

Cartesian coordinates

2nd quadrant (−,+)

1st quadrant (+,+)

3rd quadrant (−,−)

4th quadrant (+,−)

Adding and subtracting in Z

Two symbols that are the **same** are **positive**.

| + | + | → | + |
| − | − | → | + |

Two symbols that are **different** are **negative**.

| + | − | → | − |
| − | + | → | − |