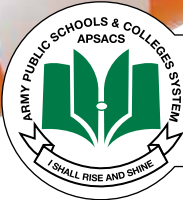# PRIMARY MATHEMATICS 3

STUDENTS' COURSE BOOK

Consultant and Author:
Dr Foong Pui Yee

Authors:
Lim Li Gek Pearlyn
Wong Oon Hua

ADDENDUM

ARMY PUBLIC SCHOOLS & COLLEGES SYSTEM

Contents

ESTIMATION

LET'S LEARN

1. 5213 adults and 785 children attended a carnival.
Find the total number of people at the carnival.
Estimate to check if your answer is reasonable.

$$5213 + 785 = 5998$$

Method 1

$$5213 \approx 5000$$
$$785 \approx 800$$
$$5213 + 785 \approx 5000 + 800$$
$$= 5800$$

5998 is close to 5800, so the answer is reasonable.

Method 2

$$5213 \approx 5200$$
$$785 \approx 800$$
$$5213 + 785 \approx 5200 + 800$$
$$= 6000$$

5998 is close to 6000, so the answer is reasonable.

There were 5998 people at the carnival.

2. Find the value of 4692 – 708.
Estimate to check if your answer is reasonable.

$$4692 - 708 = 3984$$

Method 1

$$4692 \approx 5000$$
$$708 \approx 1000$$
$$4692 - 708 \approx 5000 - 1000$$
$$= 4000$$
3984 is close to 4000, so the answer is reasonable.

Method 2

$$4692 \approx 4700$$
$$708 \approx 700$$
$$4692 - 708 \approx 4700 - 700$$
$$= 4000$$
3984 is close to 4000, so the answer is reasonable.

3. Estimate and find the value of each of the following.
(a) 6427 + 568
(b) 2649 – 1398

Can you estimate in more than one way to check the reasonableness of your answers?

DIVISION

Divide.

1. $4 \div 4$

$4 \div 4 = $ ☐

Try to divide other number by itself.
What do you notice about each product?

2. $4 \div 1$
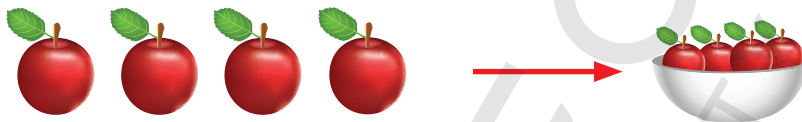
$4 \div 1 = $ ☐

Try to divide other numbers by 1.
What do you notice about each product?

3. $4 \div 2$

$4 \div 2 = $ ☐

Can you divide the following?

$2 \div 4$

Division of one number by another cannot be done in any order.

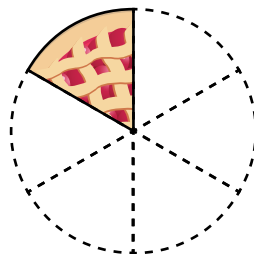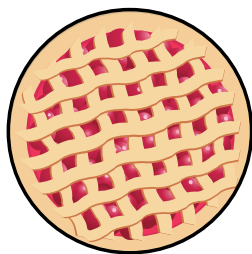OXFORD
UNIVERSITY PRESS

Flour $1\frac{1}{2}$ Kg

How many pies are there?

MIXED NUMBERS

IN FOCUS

What is the fraction shown?

1. This is 1 whole pie and 1 sixth of a similar pie.
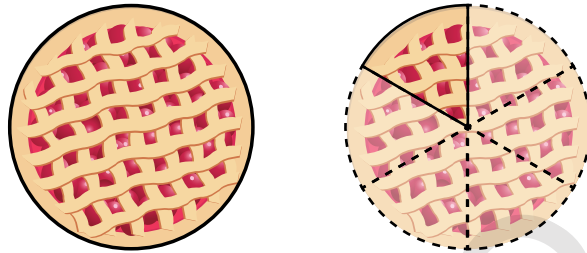
We can represent 1 whole and 1 sixth as a **mixed number.**

$$1 + \frac{1}{6} = 1\frac{1}{6}$$

There are $1\frac{1}{6}$ pies altogether.

When we add a whole number to a fraction, we will get a mixed number.

2.
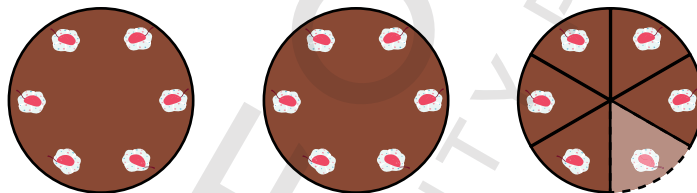
There are 2 wholes and 5 sixths of a cake.
We can also represent 2 wholes and 5 sixths as a mixed number.

$$2 + \frac{5}{6} = 2\frac{5}{6}$$

There are $2\frac{5}{6}$ cakes altogether.

3. How many litres of water are there altogether?

1 ℓ   1 ℓ   1 ℓ   1 ℓ
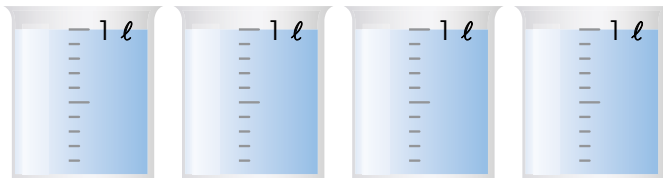
$$3 + \frac{7}{10} = 3\frac{7}{10}$$

There is $3\frac{7}{10}$ litres of water altogether.

5

4. What are the mixed numbers shown?

(a)

$$3 + \frac{1}{2} = \boxed{}$$

3 wholes and 1 half is $\boxed{}$.

(b)

$$\boxed{} + \frac{\boxed{}}{\boxed{}} = \boxed{}$$

2 wholes and 3 $\boxed{}$ is $\boxed{}$.

ADDING FRACTIONS

IN FOCUS

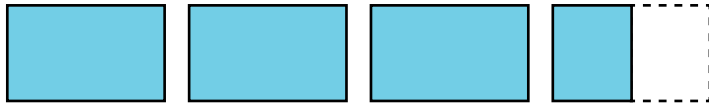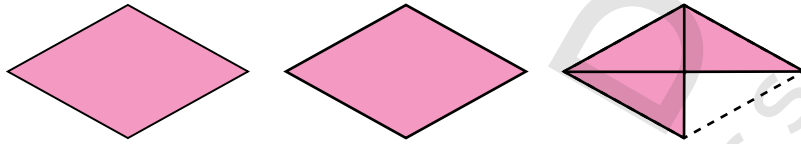Farhan had $\frac{3}{5}$ of a pie.

Waleed had $\frac{7}{10}$ of a similar pie.

How many pies did they have altogether?
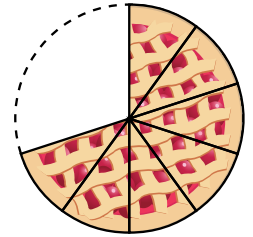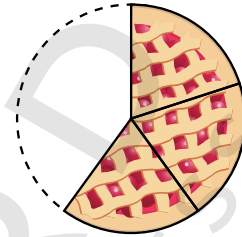
LET'S LEARN

1. To add the two fractions, we need to find the equivalent fractions with the same denominator.

$$\frac{3}{5} = \frac{6}{10}$$

$$\frac{7}{10}$$
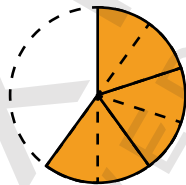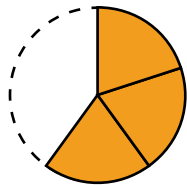
$$\frac{3}{5} + \frac{7}{10} = \frac{6}{10} + \frac{7}{10}$$

$$= \frac{13}{10}$$

$$\frac{3}{5} \overset{\times 2}{\underset{\times 2}{=}} \frac{6}{10}$$

Farhan and Waleed had $\frac{13}{10}$ pies altogether.

OXFORD
UNIVERSITY PRESS

2. Add $\frac{2}{3}$ and $\frac{5}{12}$.

Express the answer as a mixed number in its simplest form.

$$\frac{2}{3} = \frac{8}{12}$$

$$\frac{5}{12}$$
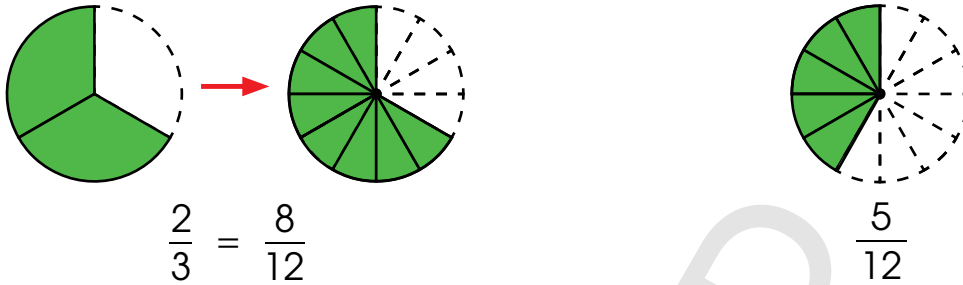
$$\frac{2}{3} + \frac{5}{12} = \frac{8}{12} + \frac{5}{12}$$

$$= \frac{13}{12}$$

3. Add the fractions using .

Express each answer as a mixed number in its simplest form.

(a) $\frac{3}{4} + \frac{5}{8}$

(b) $\frac{4}{5} + \frac{3}{10}$

(c) $\frac{4}{6} + \frac{4}{18}$

(d) $\frac{3}{4} + \frac{3}{16}$

Add the following fractions.

(a) $\frac{2}{3} + \frac{5}{9}$

(b) $\frac{3}{5} + \frac{7}{10}$

(c) $\frac{11}{12} + \frac{1}{4}$

(d) $\frac{3}{4} + \frac{5}{16}$

SUBTRACTING FRACTIONS

Sara had 3 chocolate bars.

She gave $\frac{5}{12}$ of a chocolate bar to Ain .

How much chocolate did Sara have left?

Sara   Ain

LET'S LEARN

1.

Subtract $\frac{5}{12}$ from 1 whole.

$$1 - \frac{5}{12} = \frac{7}{12}$$

Then we add $\frac{7}{12}$ to the remaining 2 wholes.

$$2 + \frac{7}{12} = 2\frac{7}{12}$$

$$3 - \frac{5}{12} = 2\frac{7}{12}$$

Sara had $2\frac{7}{12}$ chocolate bars left.

9

2. What is the difference between 3 and $\frac{2}{8}$?

Express your answer as a mixed number in its simplest form.

$$3 - \frac{2}{8} = \boxed{}$$

Subtract the fractions using ◓.

3. Subtract and express each answer in its simplest form.

(a) $1 - \frac{6}{11}$

(b) $4 - \frac{3}{7}$

(c) $3 - \frac{4}{6}$

(d) $9 - \frac{2}{8}$

PRACTICE

1. Subtract.
Express each answer as a mixed number in its simplest form.

(a) $3 - \frac{2}{3}$

(b) $4 - \frac{4}{5}$

(c) $7 - \frac{4}{9}$

(d) $5 - \frac{2}{4}$

(e) $1 - \frac{6}{10}$

(f) $4 - \frac{6}{12}$

2. Subtract and express each answer in its simplest form.

(a) $\frac{2}{5} - \frac{1}{10}$

(b) $\frac{1}{3} - \frac{2}{9}$

(c) $\frac{4}{5} - \frac{1}{20}$

(d) $\frac{15}{16} - \frac{3}{4}$

Students' Learning Outcomes:
- Know and recognise that hundredths arise by dividing an object, single digit numbers and quanti ties into hundred equal parts.
- Identify that tenths arise by dividing an object, single digit number and quantities into ten equal parts (e.g., 2/10 = 0.2)

What are some examples of decimals around you?

TENTHS

IN FOCUS

Look at the shaded parts in each figure.

1 whole

?

How do we express 1 part out of 10 parts as a decimal?

11

OXFORD
UNIVERSITY PRESS

1. Divide 1 whole into 10 equal parts.

1 part out of 10 parts is $\frac{1}{10}$.

$$\frac{1}{10} = 1 \textbf{ tenth}$$
$$= 0.1$$

$\frac{1}{10}$ is **0.1** when written as a decimal.

> We read 0.1 as **zero point one**.

> The dot in a decimal is called the decimal point.

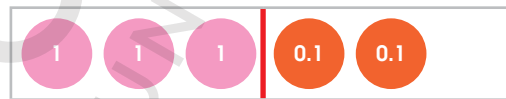**2.** How many parts of each figure are shaded?
Express as fractions and decimals.

(a)

$$\frac{}{10} = $$

(b)

$$\frac{}{10} = $$

3. Express $3\frac{2}{10}$ as a decimal.

Ones	Tenths
3	2

$$3\frac{2}{10} = 3 \text{ ones} + 2 \text{ tenths}$$
$$= 3 + 0.2$$
$$= 3.2$$

The digit 3 is in the ones place.
The digit 2 stands for 0.2.

> We read 3.2 as **three point two**.

4. Express each of the following as a decimal.
Use 🔵 and 🔴 to help you.

(a) $1\dfrac{6}{10}$

(b) $2\dfrac{4}{10}$

(c) $4\dfrac{8}{10}$

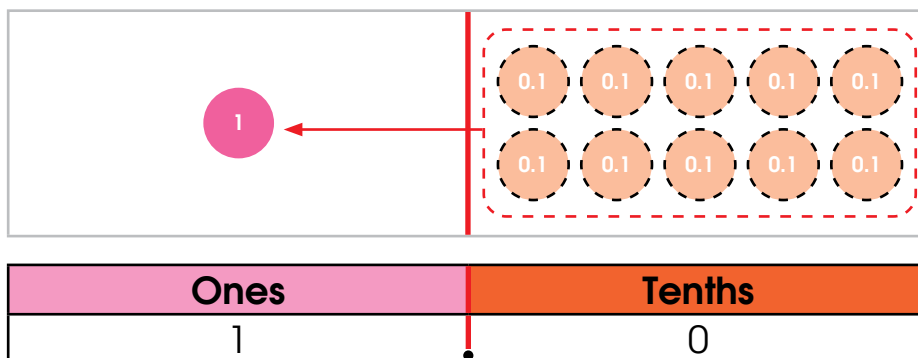(d) $10\dfrac{1}{10}$

5. 1 tenth of this figure is shaded.

10 tenths of this figure are shaded.
What is 10 tenths?

$$10 \text{ tenths } = \dfrac{10}{10}$$
$$= 1.0$$

10 tenths = 1 one

We can also use 🔵 and 🔴 to exchange 10 tenths for 1 one.

Ones	Tenths
1	0

6. How many parts of each figure are shaded?
Express your answer as a decimal.

(a)

(b)

HUNDREDTHS

IN FOCUS

Look at the shaded parts in each figure.

1 whole

1 tenth

We get 100 parts when we divide each tenth into 10 parts.

?
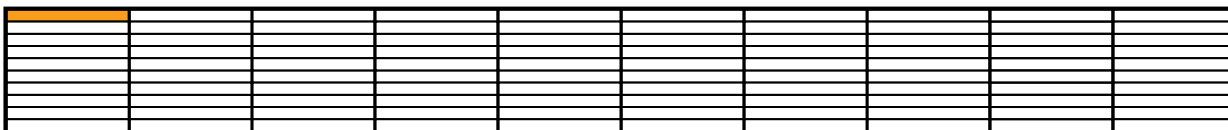
How do we express 1 part out of 100 parts as a decimal?

Choose the correct option.

(a) 40 + ☐ = 70   (20, 30)

(b) ☐ + 20 = 50   (20, 30)

(c) 10 ☐ 15 = 25   (+, -)

(d) 75 ☐ 5 = 70   (+, -)

(e) 25 + ☐ = 85   (60, 50)

(f) ☐ + 75 = 100   (35, 25)

(g) 85 ☐ 5 = 90   (+, -)

(h) 60 ☐ 40 = 20   (+, -)

Students' Learning Outcome:
- Read and write temperature to the nearest appropriate unit i.e., (^{o}C) using pictorial representations and relating temperature scale to number line.
- Compare and order temperature using <, >, and = signs.

TEMPERATURE

On a particular day, the temperatures in different cities were recorded as follows.

Karachi → 21°C	Hyderabad → 19°C	Quetta → 11°C
Lahore → 14°C	Peshawar → 12°C	

1. Arrange the names of the cities according to their temperature, from highest to lowest.

2. Complete the following using <, >, or =.

27 ^{o}C ☐ Karachi's temperature

13 ^{o}C ☐ Lahore's temperature

11 ^{o}C ☐ Quetta's temperature

10 ^{o}C ☐ Peshawar's temperature
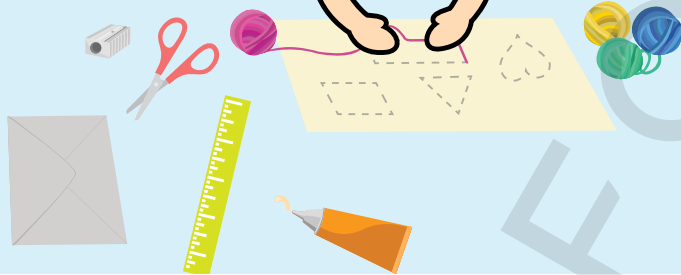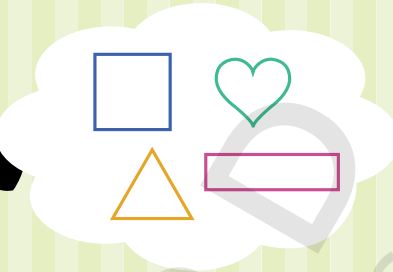
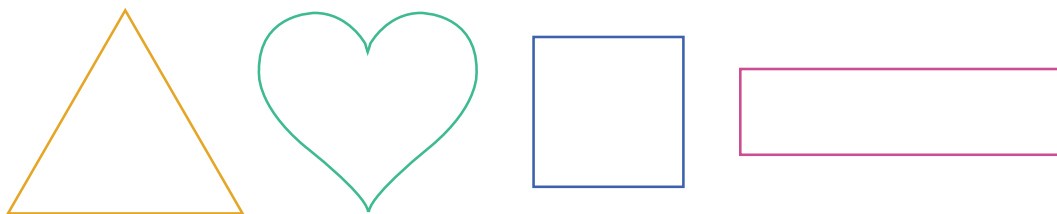What does Farwa need to find to get the correct length of yarn for the shapes?

PERIMETER

IN FOCUS
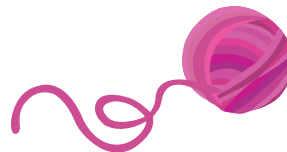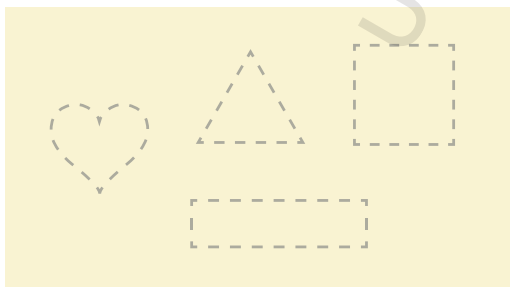
Farwa uses yarn to outline each shape.
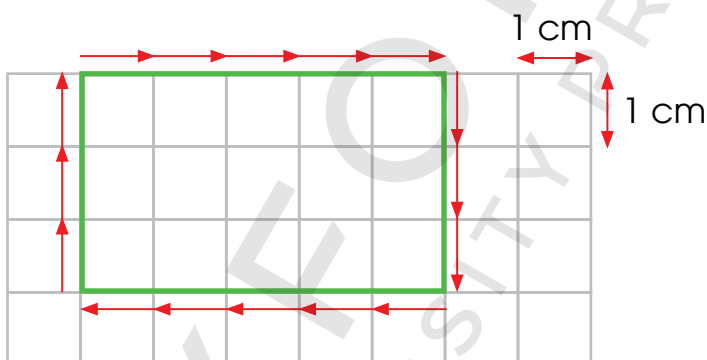How can she find the length of yarn she needs for each shape?

1.

Farwa needs to find the **perimeter** of each shape.
The perimeter of each shape is the total length around it.
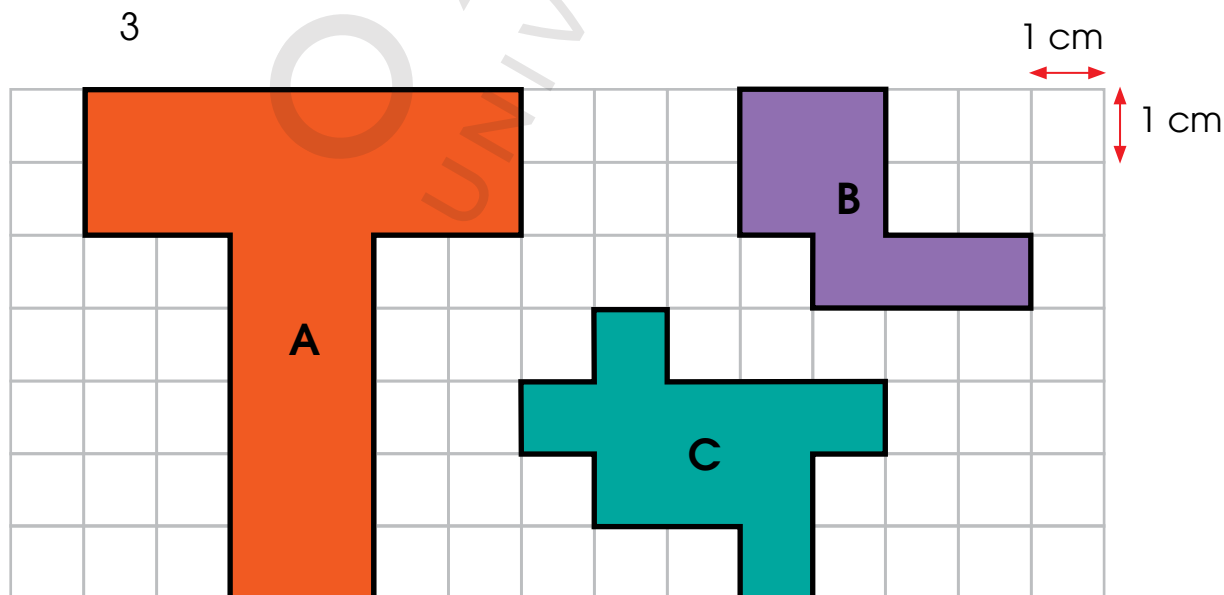
How can you find the perimeter of each figure?

2. A rectangle is drawn on a 1-cm square grid.
The perimeter of the rectangle is the total length of its sides.

1 cm

1 cm

The perimeter of the rectangle is 16 cm.

3. 3

1 cm

1 cm

A

B

C

The perimeter of Figure A is ⬜ cm.

The perimeter of Figure B is ⬜ cm.

The perimeter of Figure C is ⬜ cm.

4. Figures A, B, C and D are drawn on a 1-m square grid.

1 m

1 m

A

B

C

D
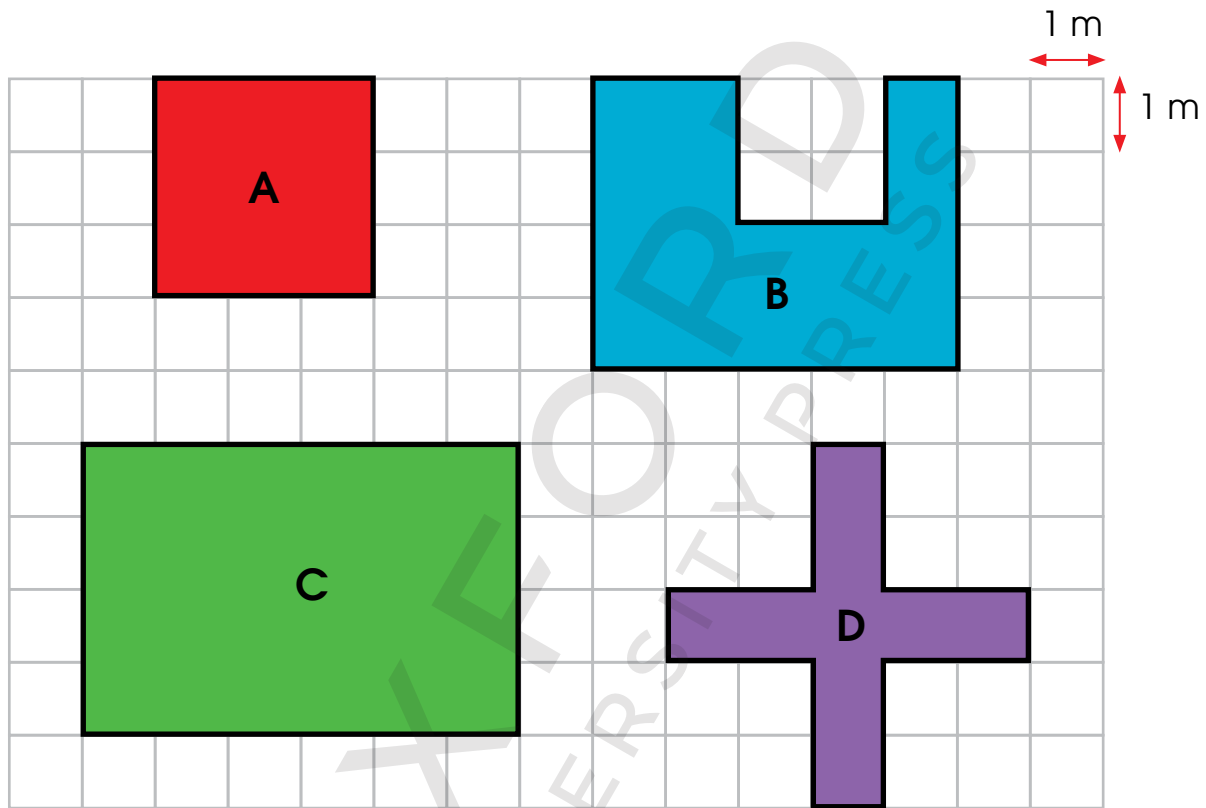
(a) Perimeter of Figure A = ⬜ m

(b) Perimeter of Figure B = ⬜ m

(c) Perimeter of Figure C = ⬜ m

(d) Perimeter of Figure D = ⬜ m

(e) Figure ⬜ has the same perimeter as Figure ⬜.

(f) Figure ⬜ has the smallest perimeter.

(g) The perimeter of Figure ⬜ is the largest.

5.

24 m

13 m   13 m

24 m
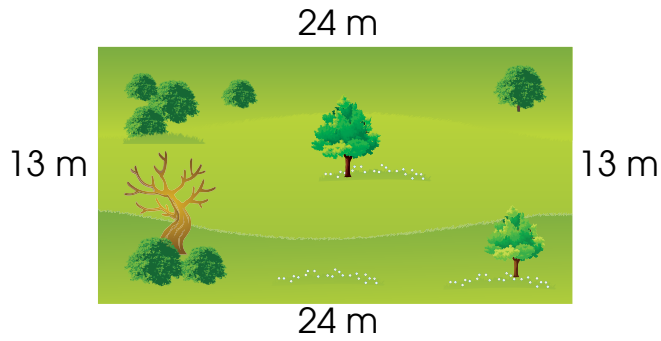
24 + 13 + 24 + 13 = ▢

The perimeter of the field is ▢ m.

6.

9 m

9 m   9 m

9 m
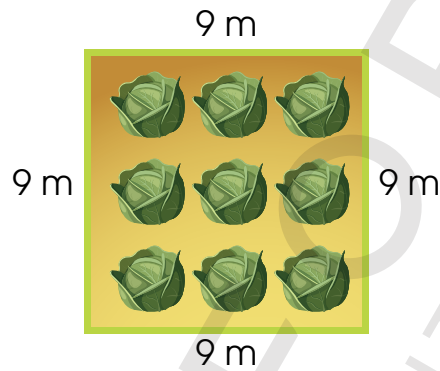
9 + 9 + 9 + 9 = ▢

▢ × ▢ = ▢

The perimeter of the vegetable plot is ▢ m.

7.

15 m

12 m

10 m

8 m

▢ + ▢ + ▢ + ▢ = ▢
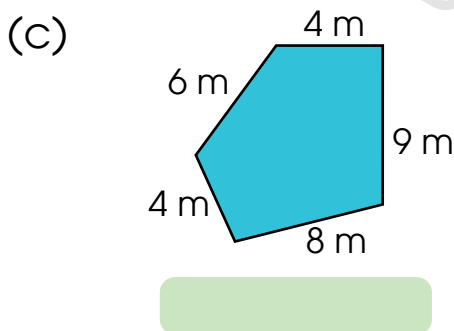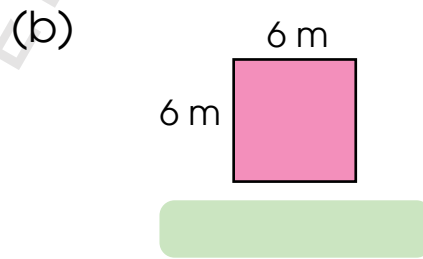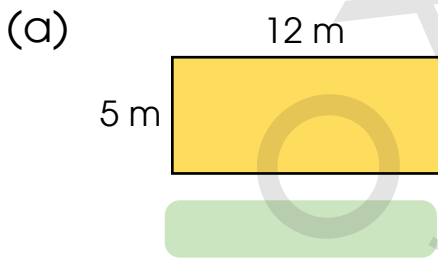
The perimeter of the flower bed is ▢ m.

1. Find the perimeter of each figure.

1 cm

1 cm
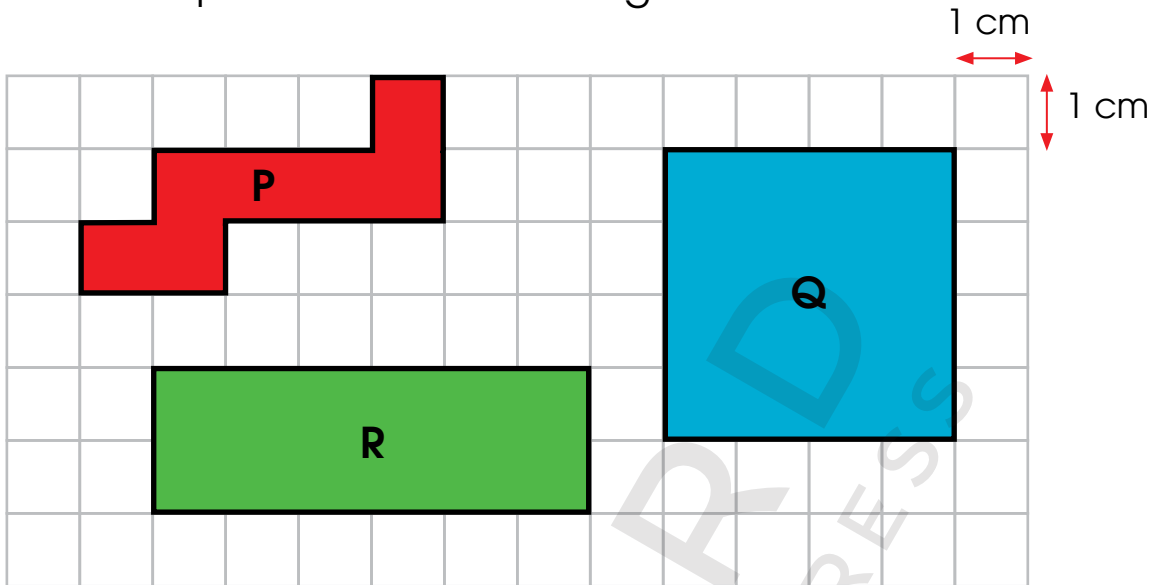
(a) Perimeter of Figure P =

(b) Perimeter of Figure Q =

(c) Perimeter of Figure R =

2. Find the perimeter of each figure.

(a)

12 m

5 m

(b)

6 m

6 m

(c)

4 m

6 m

9 m

4 m

8 m

(d)

3 m

5 m

6 m

OXFORD
UNIVERSITY PRESS
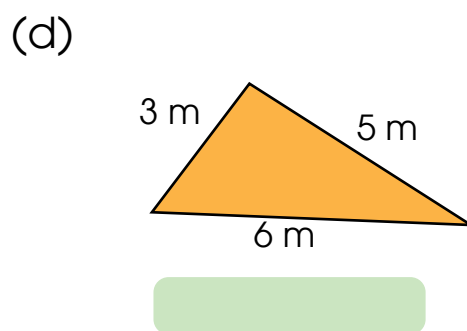
AREA IN SQUARE UNITS
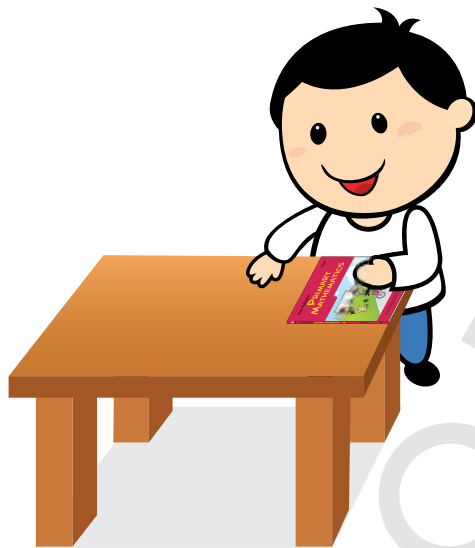
You can use your textbook to measure the area of your desk.
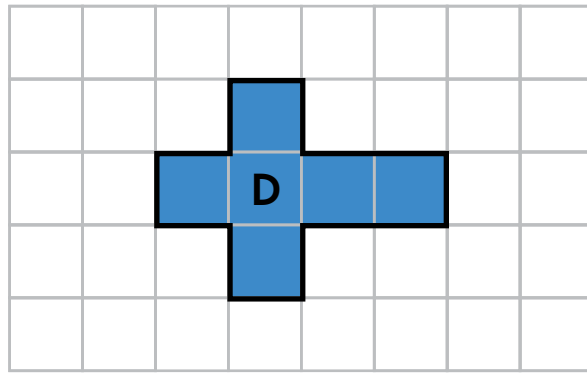
What is the area of your desk?

LET'S LEARN

1.

What other objects can you use to measure the area of your desk with?

The amount of surface taken up by a figure is the **area.**
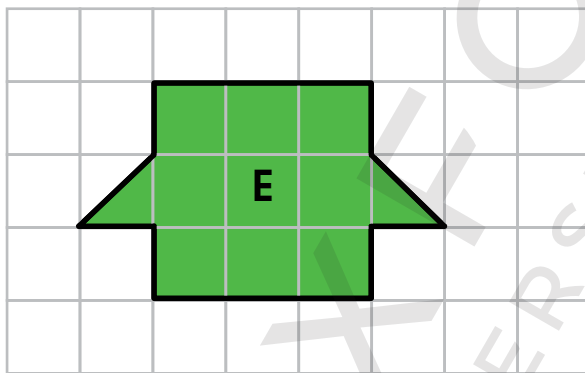
2.

Each ☐ is 1 square unit.

Figure D covers a surface of 6 square units.

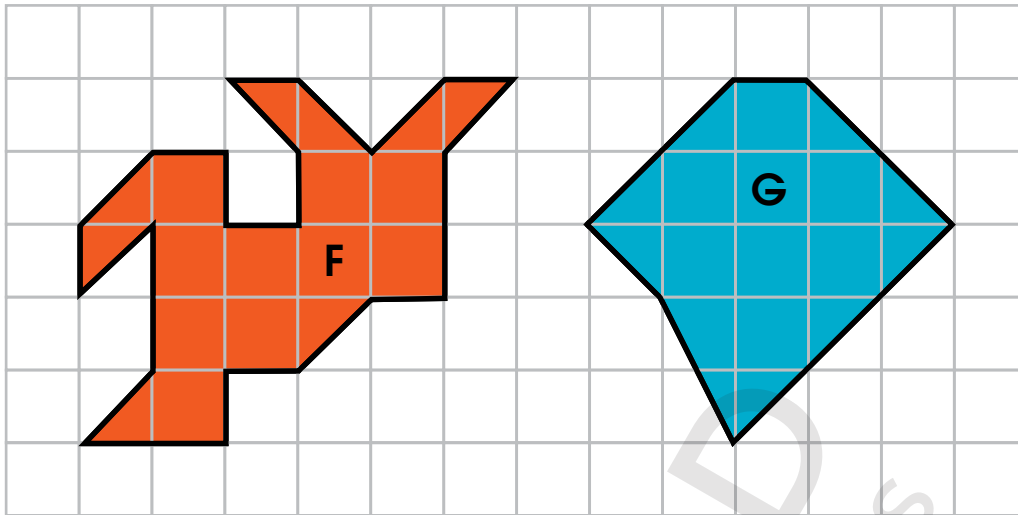The area of Figure D is 6 square units.

3.

Each ◺ is $\frac{1}{2}$ square unit or half a square unit.

There are 9 square units and 2 half square units.
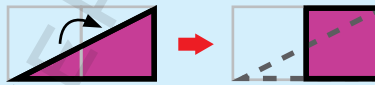
The area of Figure E is ☐ square units.

2 ◺ make 1 ☐ .
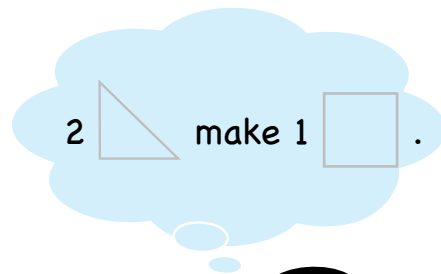
4.

(a) Figure F has ⬜ square units and ⬜ half square units.
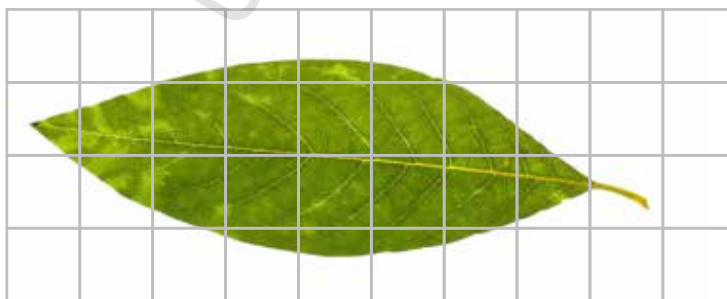   It has an area of ⬜ square units.

*(b) Figure G has an area of ⬜ square units.

Make sure you do not count a square more than once. Tick as you count the squares.

5. What is the area of the leaf?

The area of the leaf is about ⬜ square units.

Work in groups of 3.

Part A:

1. Use [■] to make some figures.

   Use 10 [■] for each figure.

2. Label each figure.
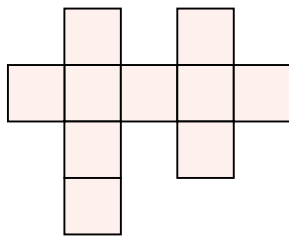
3. Record the area and perimeter of the figures.

Example

Figure 1

In your figures, make sure that the sides of the [■] touch one another.

Figure	Area (square units)	Perimeter (units)
1	10	22

What do you notice about the area and perimeter of each figure?

Part B:

Figure A is a square. Each side has a length of 4 squares.
Figure B is a rectangle. The short side has a length of 3 squares.
The long side has a length of 5 squares.

1. Use [■] to make each figure.

2. Record the area and perimeter of each figure.

   What do you notice about the area and perimeter of each figure?

What is the area of each figure?
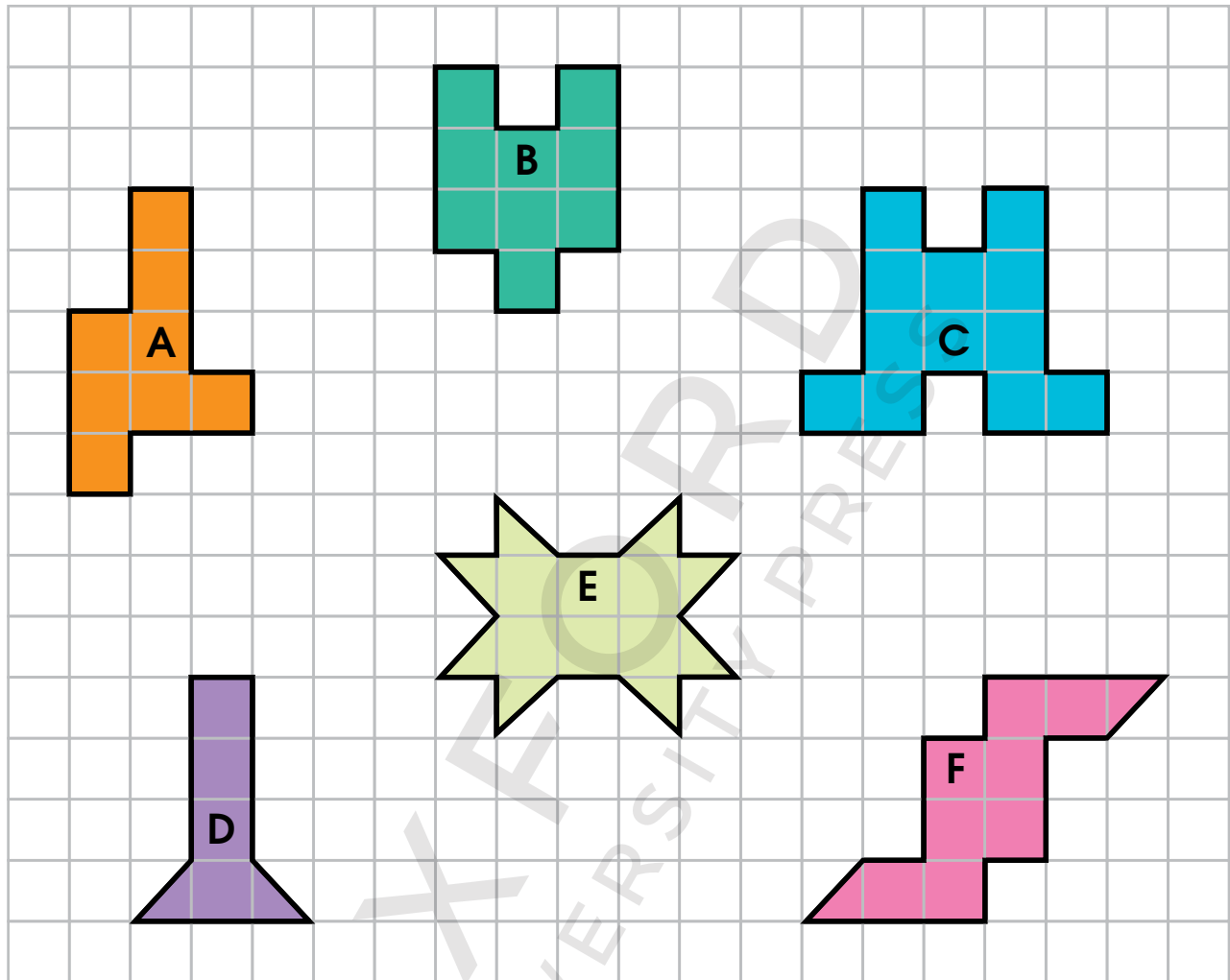
(a) Area of Figure A = square units

(b) Area of Figure B = square units

(c) Area of Figure C = square units

(d) Area of Figure D = square units

(e) Area of Figure E = square units

(f) Area of Figure F = square units

AREA IN cm² AND m²

1 cm

1 cm

This is a 1-cm square grid.
How can you find the area of objects using the square grid?

LET'S LEARN

1.

1 cm

1 cm

The square centimetre
is a unit of area.
We write cm² for square centimetre.

This is a 1-cm square.
The area of the square is **1 square centimetre (cm²)**.

2.

1 m

1 m

1 m = 100 cm

The square metre
is another unit of
area. It is used to
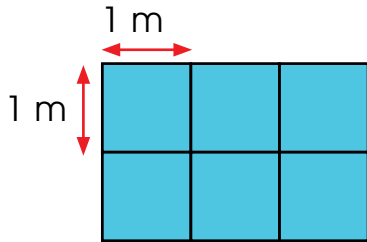measure bigger areas.
We write m² for
square metre.
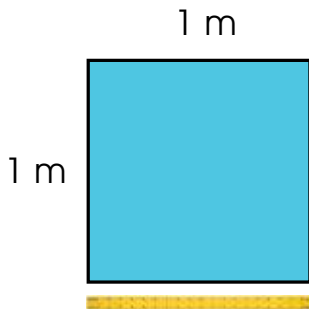
This is a 1-m square.
The area of the square is **1 square metre (m²)**.

27

3.

1 cm

1 cm

The area of the square is 4 cm².
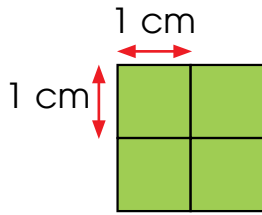
> The area of a 1-cm square is 1 cm². We can find the area by counting the number of squares.
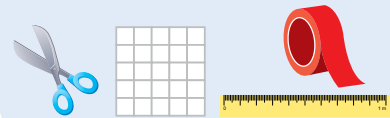
4.

1 m

1 m
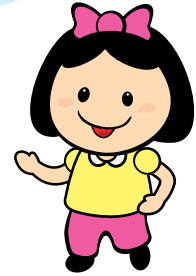
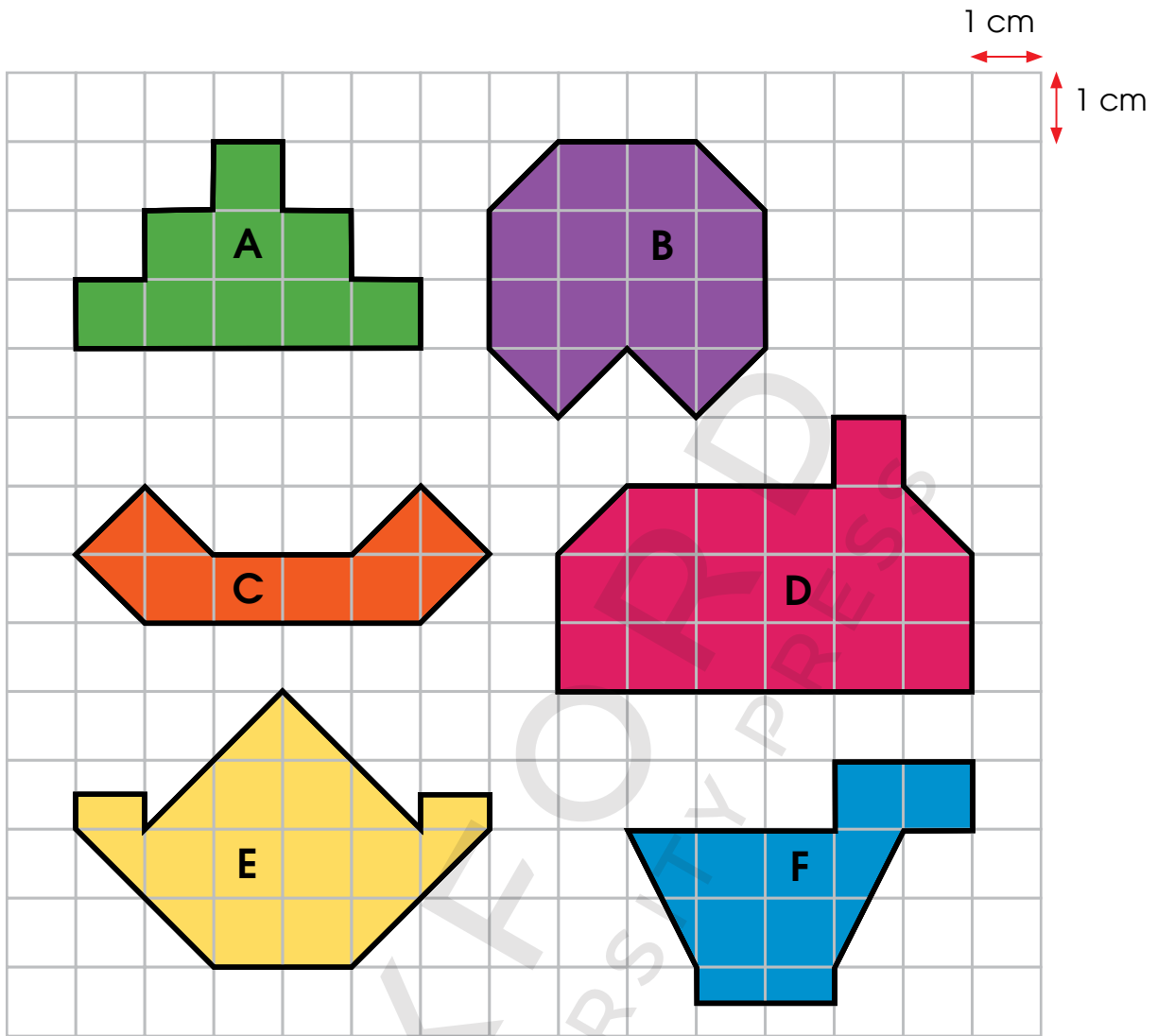The area of the rectangle is ☐ m².

Work in groups of 4.

1 Take ▭ and 🔴 .
Mark out a square with sides of 1 m on the classroom floor.
How many of your classmates can stand inside the square?
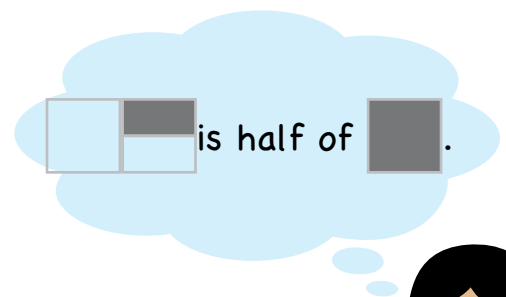
What you need:

2 Cut off 1 cm² from a piece of ▦ .
Place it inside the 1-m square on the floor.
How many 1-cm squares do you think is needed to cover one 1-m square?
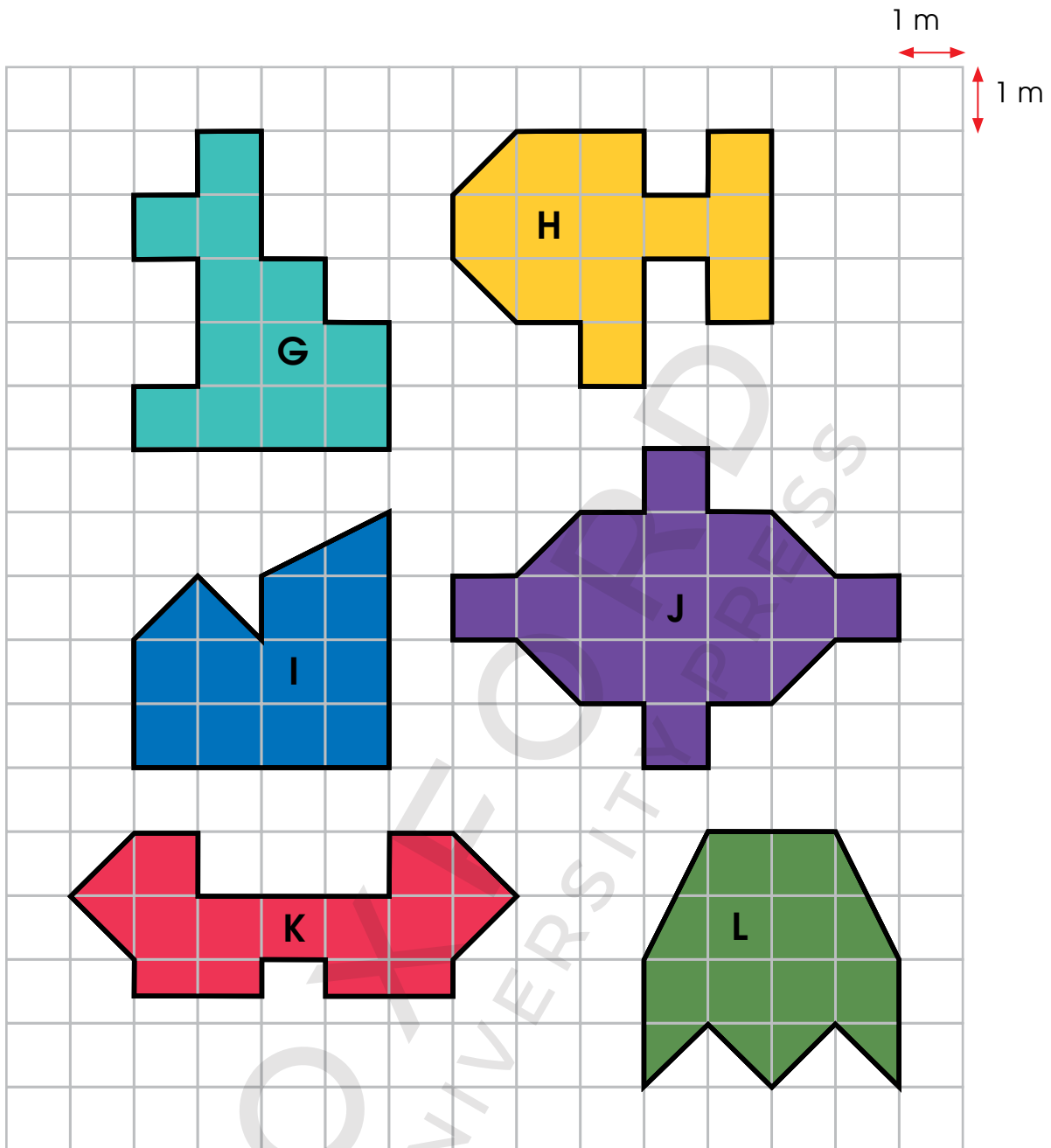
5.

(a)   The area of Figure A is ⬚ cm².

(b)   The area of Figure B is ⬚ cm².

(c)   The area of Figure C is ⬚ cm².

(d)   The area of Figure D is ⬚ cm².

*(e)   The area of Figure E is ⬚ cm².

*(f)   The area of Figure F is ⬚ cm².

◻ is half of ◼.

6.

(a) The area of Figure G is ⬚ m².

(b) The area of Figure H is ⬚ m².

(c) The area of Figure I is ⬚ m².

(d) The area of Figure J is ⬚ m².

*(e) The area of Figure K is ⬚ m².

*(f) The area of Figure L is ⬚ m².

Work in pairs.

1 Draw squares and rectangles of different

sizes on a ⊞ .

What you need:

2 Find the areas of the squares and rectangles by counting the number of squares they cover.

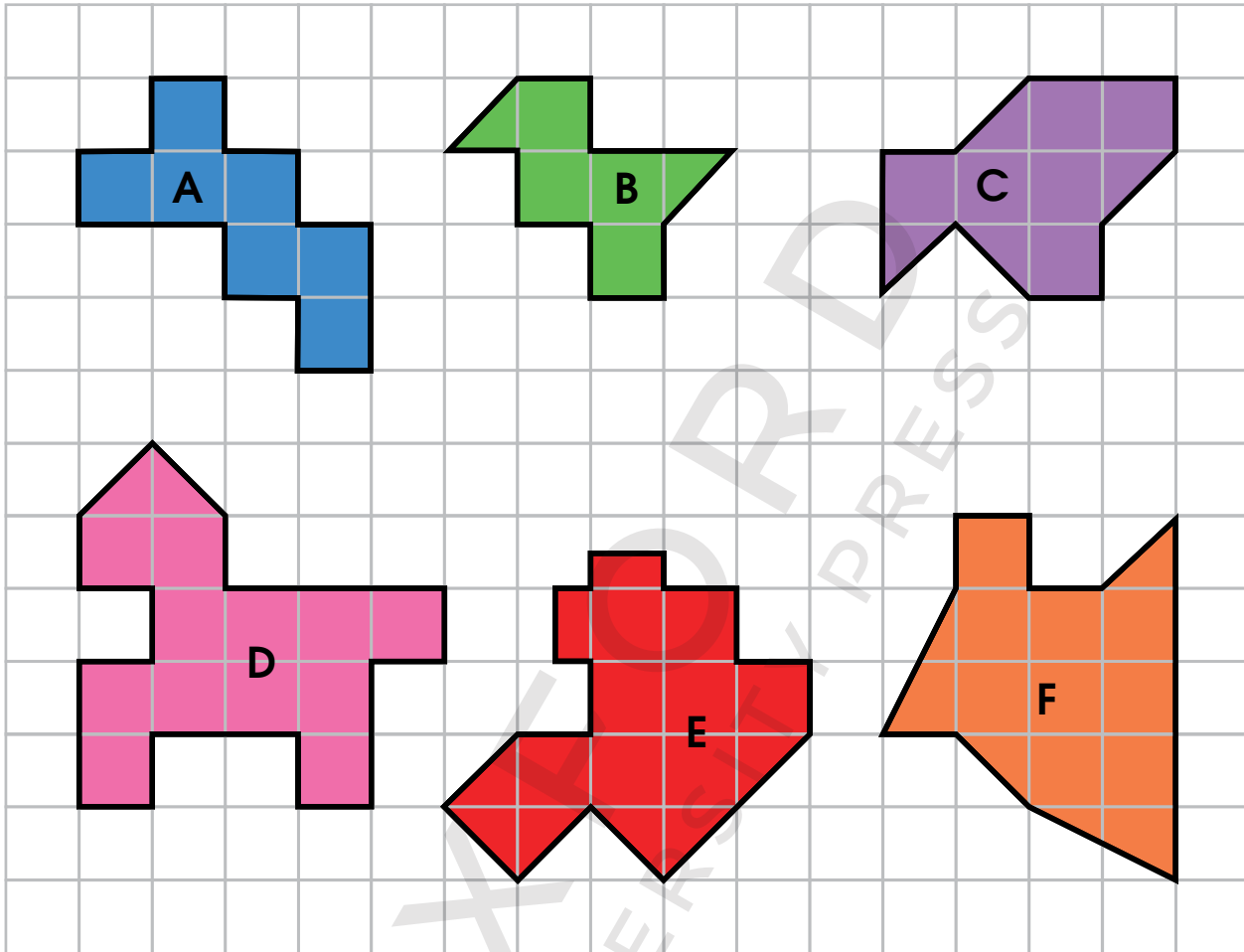**3** Record the areas and lengths of each side of the rectangles and squares.

Example
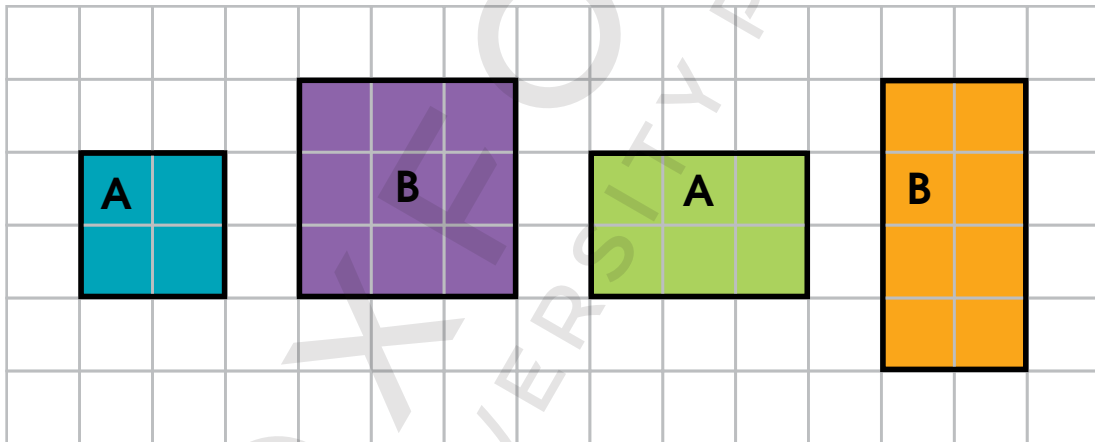
Square	Length (cm)	Length (cm)	Area (cm^2)
A	2	2	4
B	3	3	9

Rectangle	Length (cm)	Length (cm)	Area (cm^2)
A	3	2	6
B	2	4	8

How are the area and the length of each side of each figure related?

Find the area of each figure in the 1-cm square grid.

(a)   Area of Figure A = ⬚ cm^2

(b)   Area of Figure B = ⬚ cm^2

(c)   Area of Figure C = ⬚ cm^2

(d)   Area of Figure D = ⬚ cm^2

*(e)   Area of Figure E = ⬚ cm^2

*(f)   Area of Figure F = ⬚ cm^2

POLYGONS

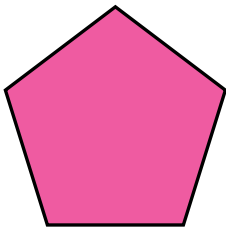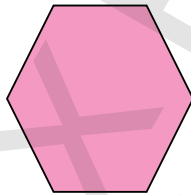A polygon is a closed 2-D shape with three or more straight sides.
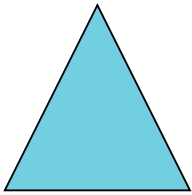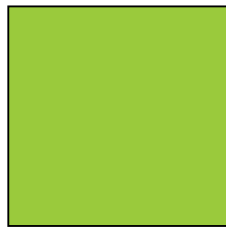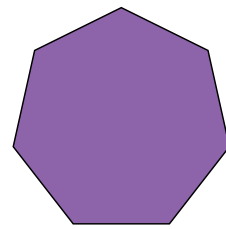
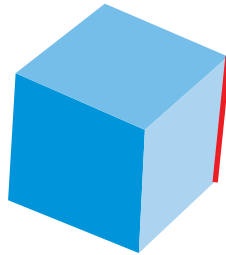Triangle   Square   Rectangle

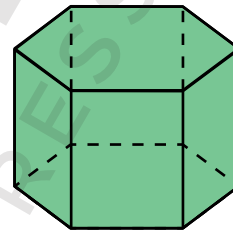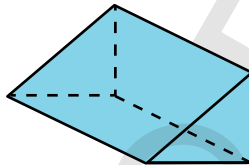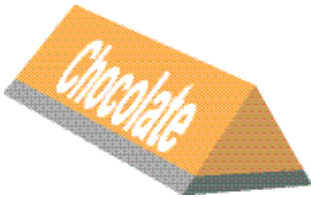Pentagon   Hexagon   Octagon   Heptagon
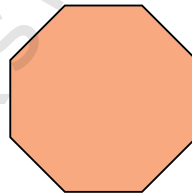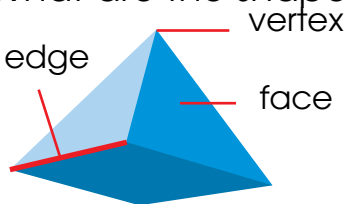
PRISMS AND PYRAMIDS

The solids shown are prisms.

1.

What do you notice about the faces at the two ends of each prism?

What are the shapes of the faces in each prism shown?

2.

edge
vertex
face

Square pyramid

Rectangular pyramid

Triangular pyramid

A **pyramid** has flat faces.
The base is a shape with straight edges.
The sides are triangles that meet at the top.

A pyramid is named after the shape of its base.

What are the similarities and differences between prisms and cylinders? Discuss with your partner.
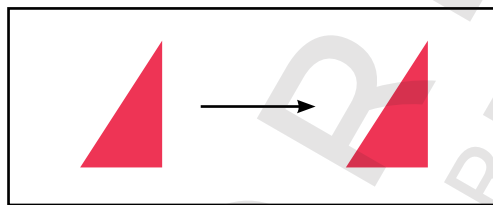
• Both shapes have flat faces and base.
• A prism has two identical bases whereas a pyramid has only one base.
• A prism has rectangular sides whereas a pyramid has triangular side.

MOVEMENT

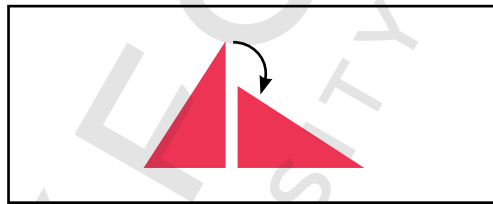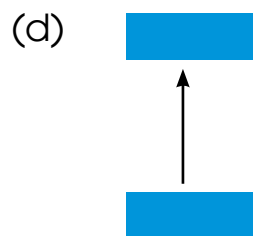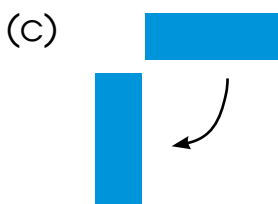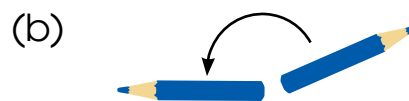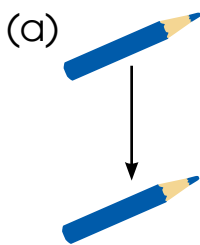**Slide** is a movement in which every point of the given shape or object moves or slides in this same direction and also by same this distance.

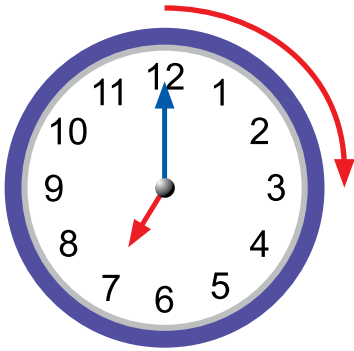

Rotation means circular movement of a shapes or object around a centre.

1. Write the correct movement for each of the following.

(a)

(b)

(c)

(d)

2.

The hands of a clock turn in a **clockwise** direction.
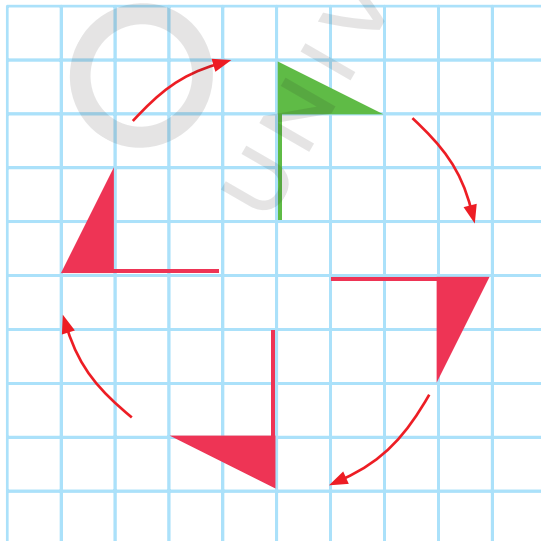
3. anticlockwise   clockwise

You can turn the steering wheel of a car **clockwise** or **anticlockwise**.

4.

Whole clockwise turn

three quarters of a clockwise turn
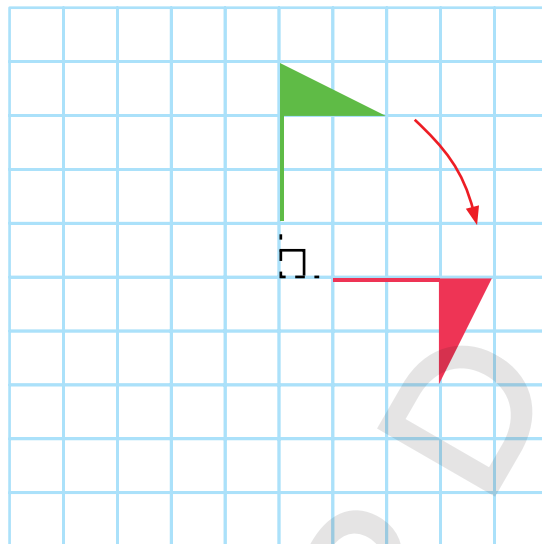
quarter of a clockwise turn

half of a clockwise turn

Three quarters of a clockwise turn is the same as one quarter of an anticlockwise turn.

Four quarters give us one whole turn.

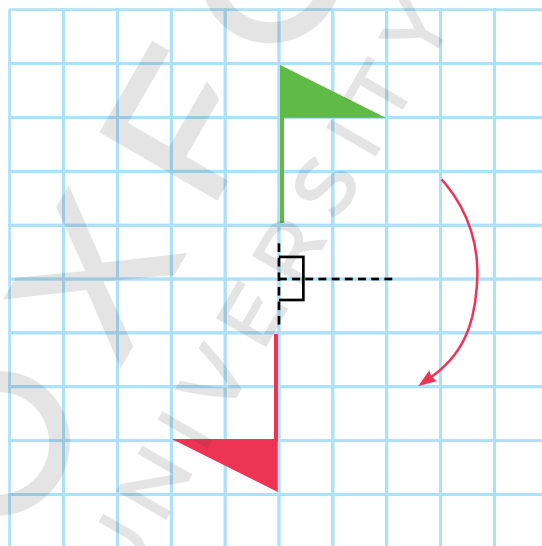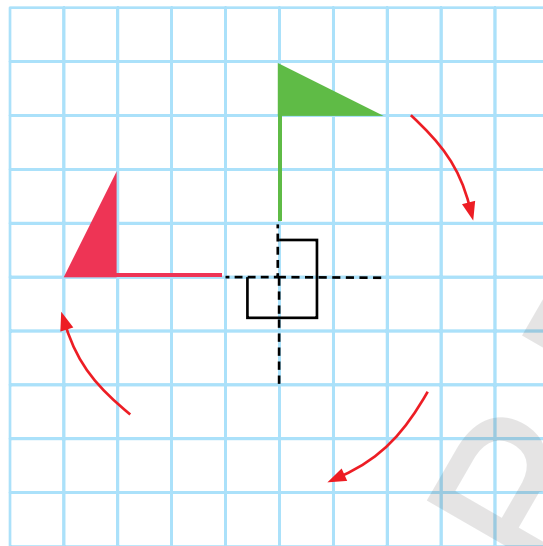**5.** quarter of a clockwise turn

A quarter of a clockwise turn is equal to a right angle.

6. half of a clockwise turn

Half of a clockwise turn is equal to 2 quarter turns.
Half of a clockwise turn is equal to 2 right angles.

OXFORD
UNIVERSITY PRESS

6. three quarters of a clockwise turn

Three quarters of a clockwise turn is equal to 3 right angles.
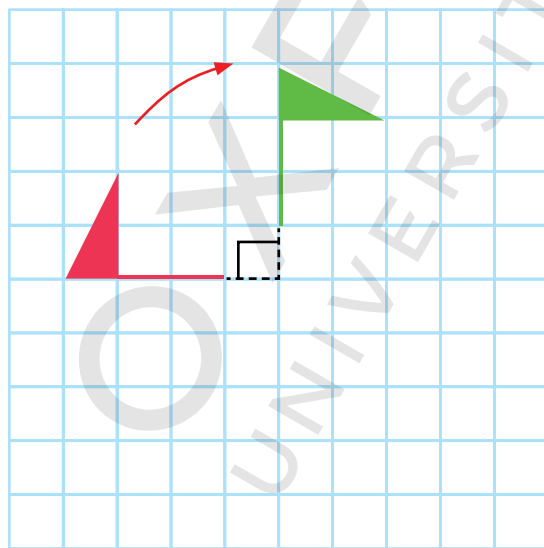
Three quarters of a clockwise turn is the same as one quarter of an anticlockwise turn.

PROBABILITY

The chance of occurring an event is called **probability**.
It is the likelihood of an outcome happening.

• If an event is sure to happen, then it has a **certain** probability.
• If an event is **more likely** to happen than not happen, then it has a likely probability.
• If the likelihood of two events happening is the same, then the two events are **equally likely** to happen.
• If an event is less likely to happen than not happen, then it has an **unlikely** probability.
• If an event is sure not happen, then it has an **impossible** probability.

less likely   more likely

impossible   even chance
or
equally likely   certain
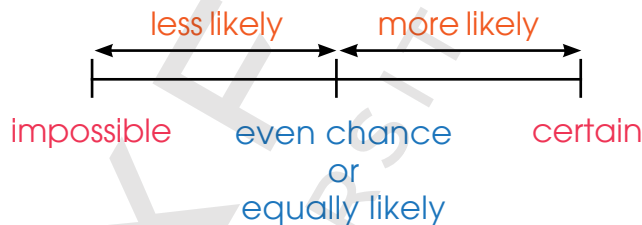
PRACTICE

Choose the correct likelihood.

1. You have one red and one blue pen in your bag. The chance of picking a red and the chance of picking blue pen is _____.

   impossible / equally likely

2. The chance the a triangle has three sides is _____.

   certain / impossible

3. The chance of getting an 8 on rolling a dice is _____.

   certain / impossible