

## Year 6 Maths facts to memorise

### Time maths facts

- 60 seconds in a minute
- 60 minutes in a hour
- 24 hours in a day
- 7 days in a week
- 52 weeks in a year
- 4 weeks in a month
- 365 days in a year
- A leap year happens every 4 years: February has 29 days on a leap year

30 days hath September,  
April, June and November,  
All the rest have 31,  
Excepting February alone,  
Which only has but 28 days clear,  
And 29 in each leap year.

24 hour clock time to 12 hour am/pm time and vice versa :

**1 am = 01:00**

**2am = 02:00**

**3am = 03:00**

**4am = 04:00**

**5am = 05:00**

**6am = 06:00**

**7am = 07:00**

**8am = 08:00**

**1pm = 13:00**

**2pm = 14:00**

**3pm = 15:00**

**4pm = 16:00**

**5pm = 17: 00**

**6pm = 18:00**

**7pm = 19:00**

**8pm = 20:00**

9am = 09:00

10am = 10:00

11am = 11:00

12 noon/midday = 12:00

9pm = 21:00

10pm = 22:00

11pm = 23:00

12 midnight = 00:00

Example questions:

How many days are there in a leap year?

How many weeks are there in 3 months?

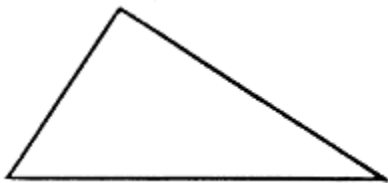
How many days in 3 weeks?

How many days are there in June and July combined?

What is quarter past 6 in the evening in 24hr clock time?

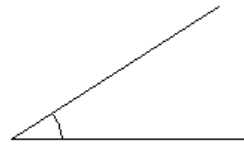
What is 21:19 in 12 hr am/pm time?

- The angles in a triangle add-up to  $180^\circ$
- The angles on a straight line add-up to  $180^\circ$
- The angles round a point add-up to  $360^\circ$
- The angles in a quadrilateral add-up to  $360^\circ$
- A **scalene triangle** has 3 sides of different length and 3 angles of different size

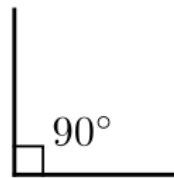


- An **isosceles triangle** has 2 equal length sides and 2 equal size angles

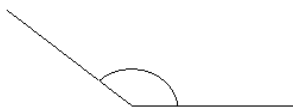
- **Acute angle** =  $1-89^\circ$



- **Right angle** =  $90^\circ$

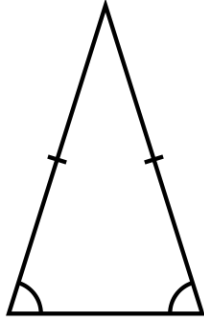


- **Obtuse angle** =  $91-179^\circ$

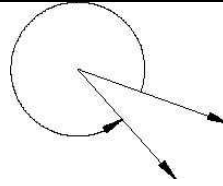
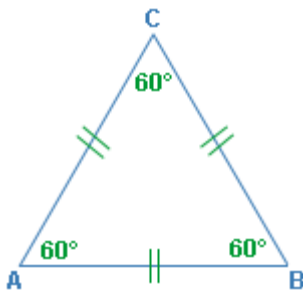


- Straight line =  $180^\circ$

- **Reflex angle** =  $181-359^\circ$



- An **equilateral triangle** has all sides and angles equal: each angle in an equilateral triangle is  $60^\circ$

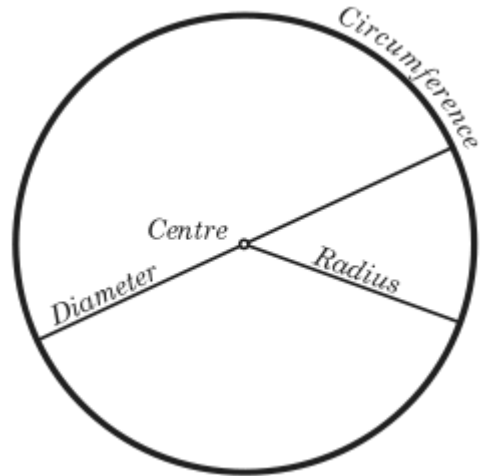


- Complete turn =  $360^\circ$

- That to find the total interior of all the angles inside a regular polygon you need to follow the following formula:  $n$  (number of sides)  $- 2 \times 180^\circ$
- Memorising the table below will help with this:

Number of Sides	Polygon Name	Number of Triangles Formed	Interior Angle Sum Measure
3	Triangle	1	$180^\circ$
4	Quadrilateral	2	$360^\circ$
5	Pentagon	3	$540^\circ$
6	Hexagon	4	$720^\circ$
7	Heptagon	5	$900^\circ$
⋮	⋮	⋮	⋮
$n$	$n$ -gon	$(n - 2)$	$(n - 2) \cdot 180^\circ$

- That a **circle** contains a radius, circumference and a diameter:
- The **radius** is the length from the circumference of a circle to its centre.
- The **circumference** is the length of the edge of a circle.
- The **diameter** is a straight line going through the centre of a circle connecting two points on the circumference.
- The **diameter** can be found by multiplying the **radius** by 2 ( $d = r \times 2$ ).



You need to recognise **percentage, fraction and decimal equivalents.**

$50\% = \frac{1}{2} = 0.5$   
 $10\% = 1/10 = 0.1$   
 $30\% = 3/10 = 0.3$   
 $70\% = 7/10 = 0.7$   
 $80\% = 4/5 = 0.8$   
 $90\% = 9/10 = 0.9$   
 $20\% = 1/5 = 0.2$   
 $40\% = 2/5 = 0.4$   
 $60\% = 3/5 = 0.6$   
 $25\% = 1/4 = 0.25$   
 $75\% = \frac{3}{4} = 0.75$   
 $1\% = 1/100 = 0.01$   
 $3\% = 3/100 = 0.03$   
 $7\% = 7/100 = 0.07$

A **prime number** has exactly 1 factor pair. The pair is always 1 and the number itself. 1 is not a prime number, as it only has one factor:  $1 \times 1 = 1$

2 is the only even prime number.

You should be able to list the first 10 prime numbers: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29

A **square number** is a number multiplied by itself. These are the first 10 square numbers: memorise them.

$1^2 = 1 \times 1 = 1$   
 $2^2 = 2 \times 2 = 4$   
 $3^2 = 3 \times 3 = 9$   
 $4^2 = 4 \times 4 = 16$   
 $5^2 = 5 \times 5 = 25$   
 $6^2 = 6 \times 6 = 36$   
 $7^2 = 7 \times 7 = 49$   
 $8^2 = 8 \times 8 = 64$   
 $9^2 = 9 \times 9 = 81$   
 $10^2 = 10 \times 10 = 100$

A **cubed number** is a number multiplied by itself twice, for example:  $3^3 = 3 \times 3 \times 3$

These are the first 10 cubed numbers: memorise them.

$1^3 = 1 \times 1 \times 1 = 1$   
 $2^3 = 2 \times 2 \times 2 = 8$   
 $3^3 = 3 \times 3 \times 3 = 27$   
 $4^3 = 4 \times 4 \times 4 = 64$   
 $5^3 = 5 \times 5 \times 5 = 125$   
 $6^3 = 6 \times 6 \times 6 = 216$   
 $7^3 = 7 \times 7 \times 7 = 343$   
 $8^3 = 8 \times 8 \times 8 = 512$   
 $9^3 = 9 \times 9 \times 9 = 729$   
 $10^3 = 10 \times 10 \times 10 = 1000$

In year 6, children are expected to **convert between commonly used imperial and metric measurements.** Therefore, it would be very useful if they knew the following conversion values:

- 1 km =  $\frac{5}{8}$  mile
- 1 m = 39.37 inches
- 1 foot = 30.5 cm
- 1 inch = 2.54 cm
- 1 kg = 2.2 lb
- 1 gallon = 4.5 litres
- 1 litre = 1.75 pints

Children are expected to be able to find the **mean** of a set of numbers.

This is an **average** found by adding all the numbers together and then dividing your total by the amount of numbers there were, for example:

$$1 + 5 + 6 = 12$$

$$12 \div 3 = 4$$

So the **mean** is 4

You need to know how to convert between metric units:

$10\text{mg} = 1\text{cg}$   
 $1000\text{mg} = 1\text{g}$   
 $100\text{cg} = 1\text{g}$   
 $100000\text{cg} = 1\text{kg}$   
 $1000\text{g} = 1\text{kg}$   
 $1000\text{kg} = 1\text{ tonne}$

$10\text{mm} = 1\text{cm}$   
 $1000\text{mm} = 1\text{m}$   
 $100\text{cm} = 1\text{m}$   
 $100000\text{cm} = 1\text{km}$   
 $1000\text{m} = 1\text{km}$

$10\text{ml} = 1\text{cl}$   
 $1000\text{ml} = 1\text{l}$   
 $100\text{cl} = 1\text{l}$   
 $100000\text{cl} = 1\text{kl}$   
 $1000\text{l} = 1\text{kl}$

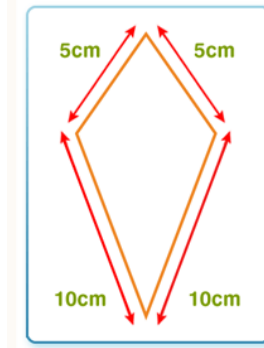
$\frac{1}{2}$  a litre is 500ml  
 $\frac{3}{4}$  of a litre is 750 ml  
 $\frac{1}{4}$  of a litre is 250 ml

$\frac{1}{2}$  a kilometre 500m  
 $\frac{3}{4}$  of a kilometre 750m  
 $\frac{1}{4}$  of a kilometre 250m

$\frac{1}{2}$  a kilogram 500g  
 $\frac{3}{4}$  of kilogram 750g  
 $\frac{1}{4}$  of kilogram 250g

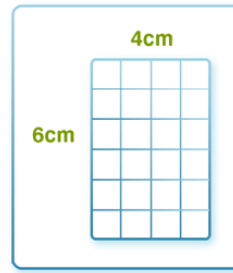
$\frac{1}{2}$  a metre 50cm  
 $\frac{3}{4}$  of a metre 75cm  
 $\frac{1}{4}$  of a metre 25cm

### Perimeter



- The perimeter is the **distance** all the way around the **outside** of a 2D shape.
- To work out the perimeter, **add up the lengths of all the sides**.  
The perimeter of this shape is  $5 + 5 + 10 + 10 = 30\text{ cm}$

### Area



- The area of a 2D shape is the **amount of surface it covers**.
- To work out the area of a rectangle, multiply its length (the longer side) by its width (the shorter side):

$$\text{area} = \text{length} \times \text{width}$$

The area of this rectangle is  $6 \times 4 = 24\text{ cm}^2$

### Volume

The **volume** of a cube or cuboid = **length x breadth x height**

In Year 6 you should know your **2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12 timetables**. Able mathematicians should know each timetable up to x12, not just stopping at x10. Similarly, you should know all the division facts up to  $144 \div 12$ .

You are expected to know all the **number bonds** to 100 that include multiples of 5: e.g.,  $15+85$ ,  $45+55$ ,  $40+60$ ,  $25+75$ .

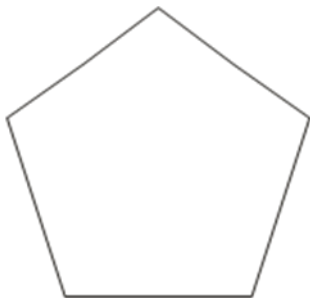
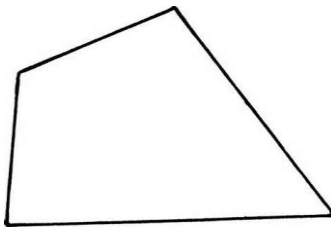
Children should have a firm grasp of number bonds to 10 ( $1+9$ ,  $3+7$ ,  $2+8$ ,  $3+7$ ,  $4+6$ ,  $5+5$ ) and be able to apply this knowledge to quickly recall the **number bond to 1** ( $0.1+0.9$ ,  $0.3+0.7$ ,  $0.2+0.8$ ,  $0.3+0.7$ ,  $0.4+0.6$ ,  $0.5+0.5$ ).

Plus the number bonds to 1 using hundredths: e.g.,  $0.17+0.83$ ,  $0.34+0.66$ ,  $0.29+0.71$

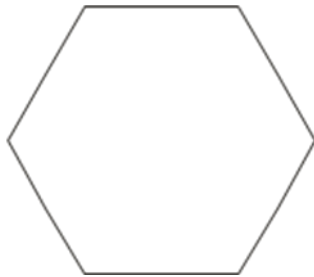
### 2D Shapes

You need to be able to name and recognise, the regular and irregular forms of, the following **polygons**:

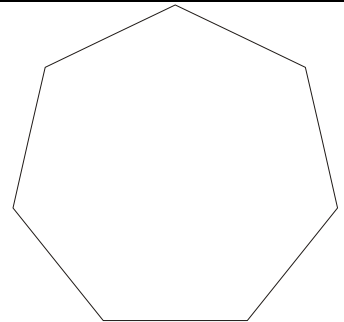
Quadrilateral (any 4 sided shape)



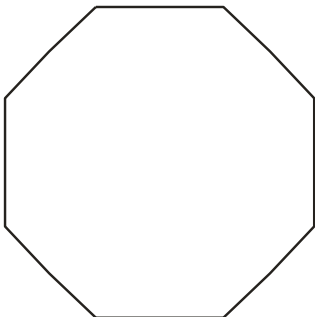
pentagon (5 sides)



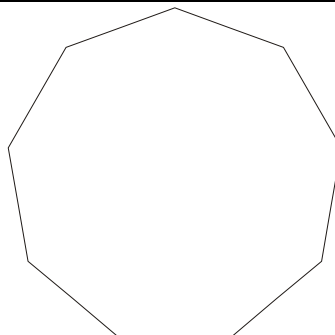
hexagon (6 sides)



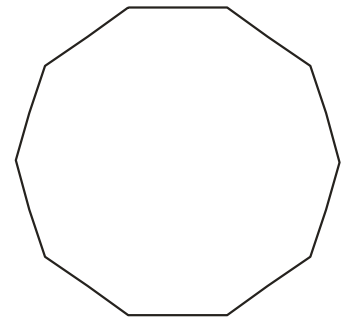
Septagon/heptagon (7sides)



octagon ( 8 sides)



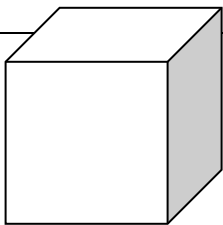
Nonagon (9 sides)



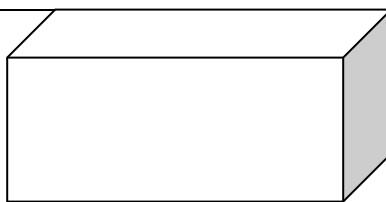
Decagon (10 sides)

### 3D shapes

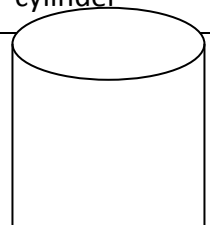
cube



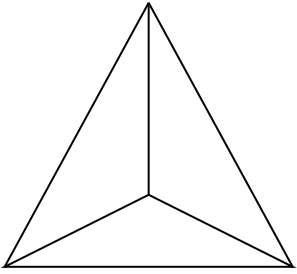
cuboid



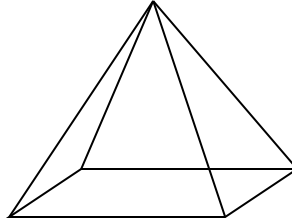
cylinder



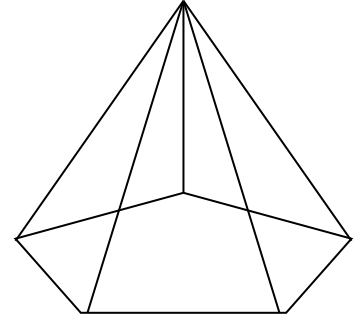
Triangular based pyramid (a **tetrahedron** is a triangular based pyramid where all the face are the same size.)



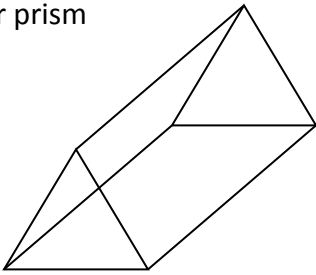
Square based pyramid



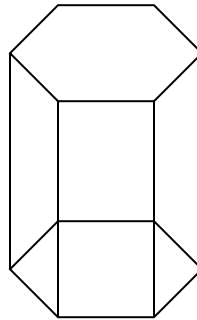
Pentagonal based pyramid



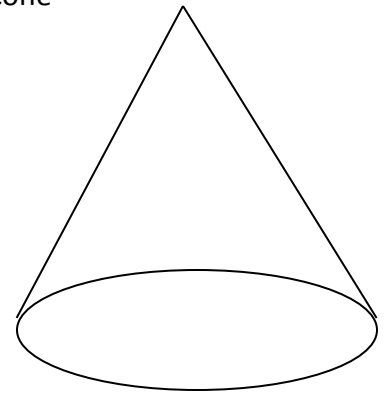
Triangular prism



Hexagonal prism



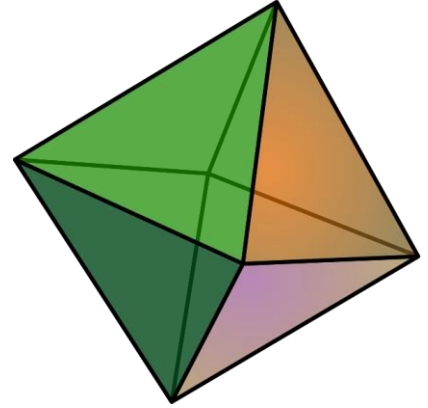
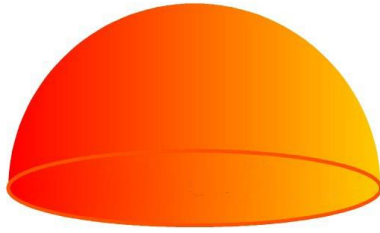
cone



Sphere

Hemisphere

Octahedron (a regular octahedron has eight equilateral triangles faces)



### Roman Numerals

Arabic Numeral

Roman Numeral

1

I

2

II

3

III

4

IV

5

V

6

VI

7

VII

8

VIII

9

IX

10

X

20

XX

30

XXX

40

XL

50

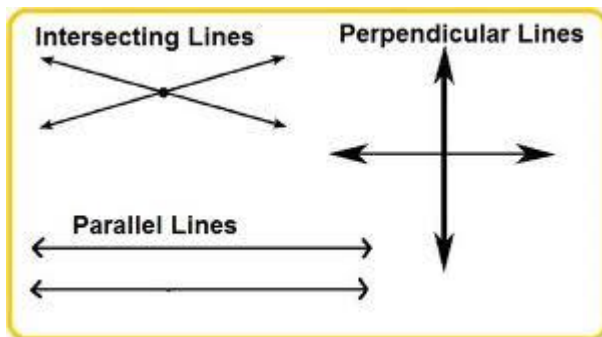
L



60	LX
70	LXX
80	LXXX
90	XC
100	C
500	D
1000	M

Children should know the difference between **parallel, perpendicular and intersecting lines**.

- Lines are parallel if they are always the same distance apart (called "equidistant"), and will never meet. (They also point in the same direction).
- **Perpendicular lines** are lines that intersect each other at exactly a ninety degree angle. Lines are not perpendicular if the angles in which they intersect at are not equal to ninety degrees.
- **Intersecting lines** are where two lines meet or cross one another.



Children should memorise simple **conversions** between **percentages and degrees in a pie chart**. It would be very useful if they knew the following conversions:

$$10\% = 36^\circ$$

$$25\% = 90^\circ$$

$$50\% = 180^\circ$$

$$75\% = 270^\circ$$

$$33\% = 120^\circ \text{ (roughly)}$$

$$66\% = 240^\circ \text{ (roughly)}$$

$$20\% = 72^\circ$$

**Fraction addition and subtraction.** Children in year 6 are expected to know, off by heart, the following **fraction addition and subtraction** facts:

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

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

$$\frac{1}{5} + \frac{2}{10} = \frac{2}{5}$$

$$\frac{1}{3} + \frac{2}{6} = \frac{2}{3}$$

$$\frac{1}{4} + \frac{2}{8} = \frac{1}{2}$$

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

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

$$\frac{2}{5} - \frac{2}{10} = \frac{1}{5}$$

$$\frac{2}{3} - \frac{2}{6} = \frac{1}{3}$$

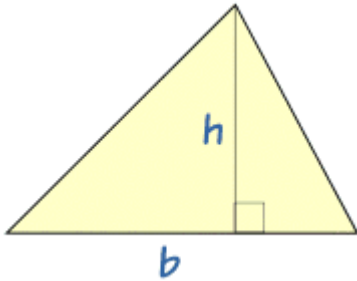
$$\frac{1}{2} - \frac{2}{8} = \frac{1}{4}$$

Children will also be expected to know how to find the area of **triangles** and **parallelograms**.

### **Triangles:**

The area is **half of the base times height**.

- "b" is the distance along the base
- "h" is the height (measured at right angles to the base)

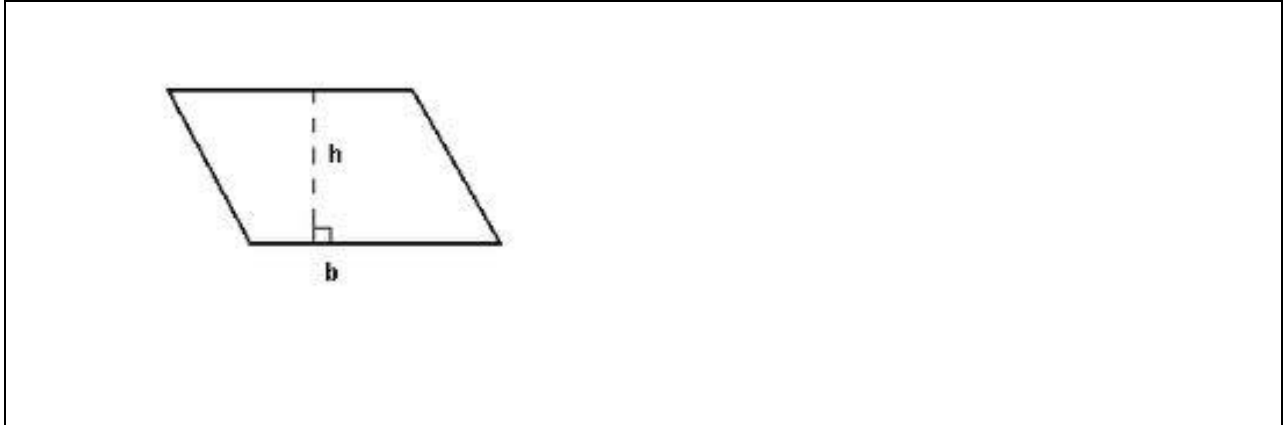


This formula works for all triangles (scaline, isocles and equilateral); however, there is another way to find the area of a scaline triangle, but you do not need to know this in year 6.

### **Parallelograms:**

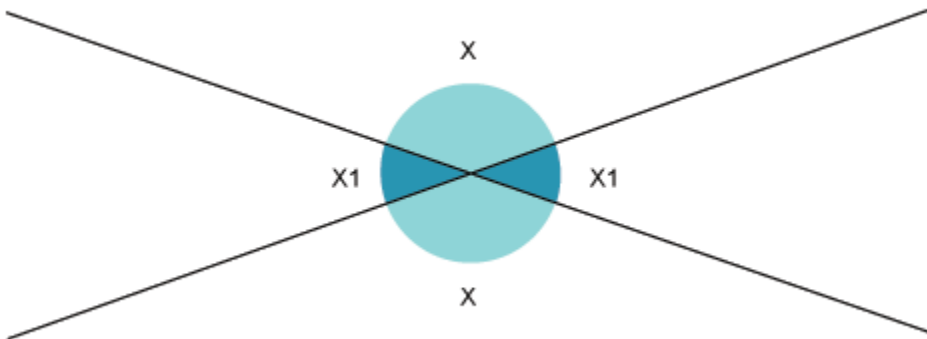
The area is **the base times height**.

- "b" is the distance along the base
- "h" is the height (measured at right angles to the base)

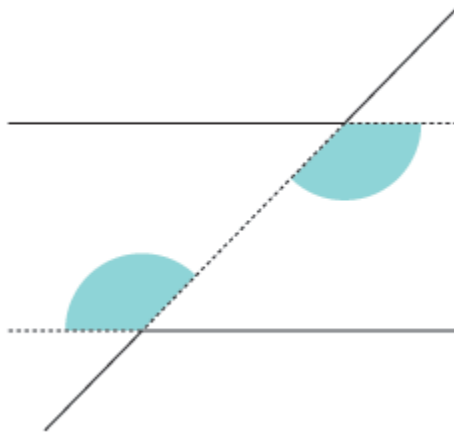
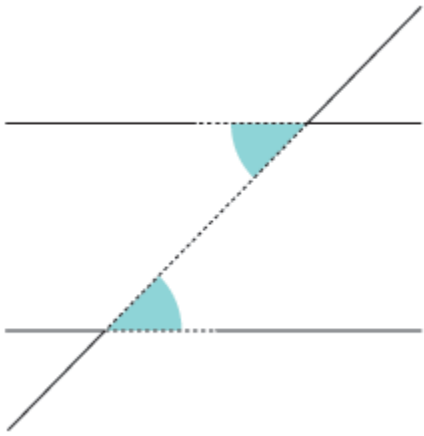


It would also be useful for children to know the following facts about angles on lines:

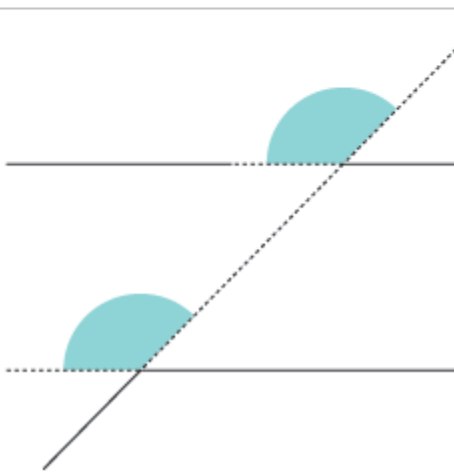
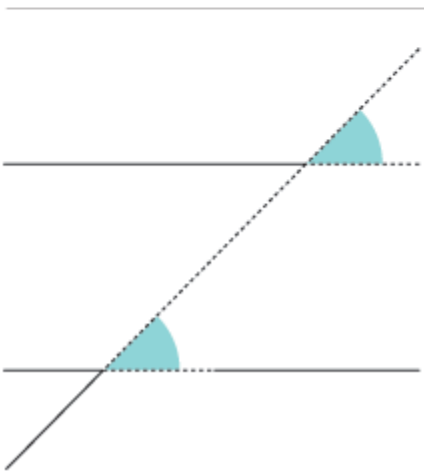
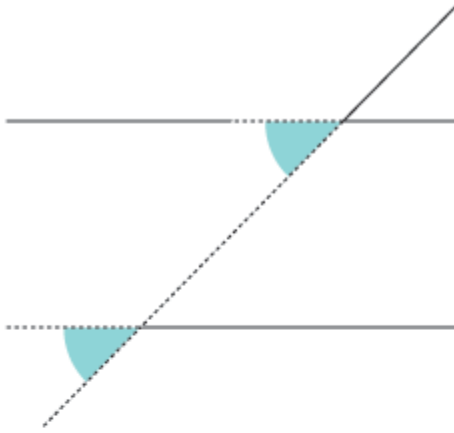
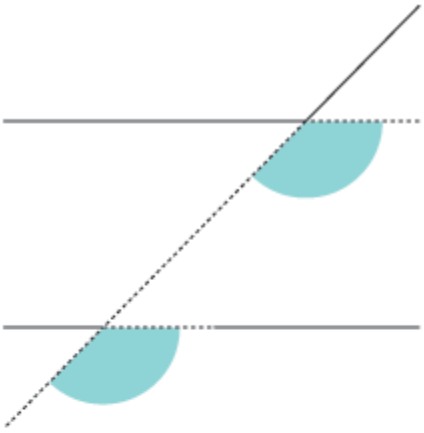
1. When two lines intersect, the opposite (X) angles are equal:



2. On parallel lines, alternate (Z) angles are equal:



3. On parallel lines, corresponding (F) angles are equal:



4. On parallel lines, co-interior (C) angles add up to  $180^\circ$ :

