Maths-Whizz®
by whizz EDUCATION

Making Maths Stick

End of year three

Maths-Whizz account details:

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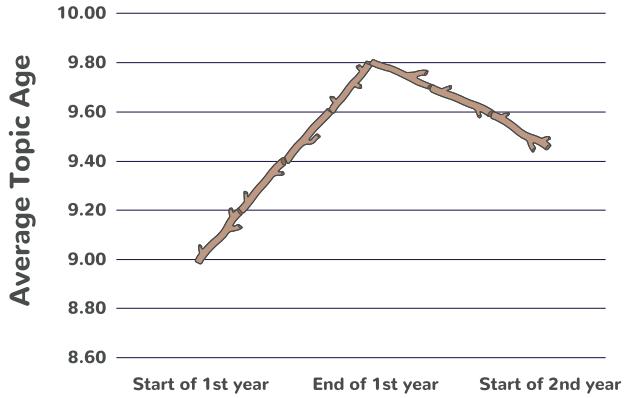
Contents

Making Maths Stick

Did you know?

At Whizz Education, we've been examining our live learning data which shows that **children can lose 2.6 months worth of learning over a typical 6 week summer holiday!**

This is known as Summer Learning Loss and this year, we've decided to do something about it.



Overall summer learning loss

Reducing summer learning loss

We recommend children continue to use Maths-Whizz throughout the year, achieving at least 3 Progressions each week (that's likely to take between 45 and 60 minutes per week). So, over a 6-week summer holiday, not only will children be able to maintain their maths knowledge, they will also make additional progress as well. For such a small amount of time each week the gains are huge!

Making Maths Stick this summer

We've created a handy chart for you to stick up at home as a way of tracking the Progressions your child has made on Maths-Whizz over the holidays.

We've also created a fun activity pack, full of ideas, activities and games to bring the maths your children have been learning at school to life, and all inspired by the outdoors! The activities and games can be done at home, on holiday, while you're visiting friends, in the local park, the wood, at the beach or in the garden. Our activities involve a range of engaging, hands-on activities and games to suit all learning styles. Every activity aims to encourage enquiry, creativity and teamwork in making maths fun.

Getting started

Everything you need can be found outdoors or in cupboards at home, so you can be creative! For rainy days or if you want to stay indoors, you can use paper straws, spaghetti, pencils, beans or building blocks. If you're outside, remind children to be kind to the environment - be careful not to disturb or damage trees or plants, use what you find on the ground instead. And always wash your hands before handling food and drinks.

What's in the pack?

There are 12 activities, for each year group - have a look through and you can choose the pack that matches the year group your child has just finished or the year group they will join in September. Try to complete two a week throughout the holidays.

Connect with us!

Share what you have been up to with us through Twitter or Facebook - just search **@MathsWhizzTutor**. We will share the best of your posts with our followers each week! Most of all, have fun Making Maths Stick over the summer.

Name:

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Weekly Progression chart

Maths-Whizz Progressions

Draw a tick over the stone for every Progression you make.
How many did you make in total this week? Write it in the box!

Week 1				
Week 2				
Week 3				
Week 4				
Week 5				
Week 6				

Activities

Put a tick in the box when you have completed the exercise in your 'Making Maths Stick' activity pack!

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

Activity one - Counting stick

Key skills

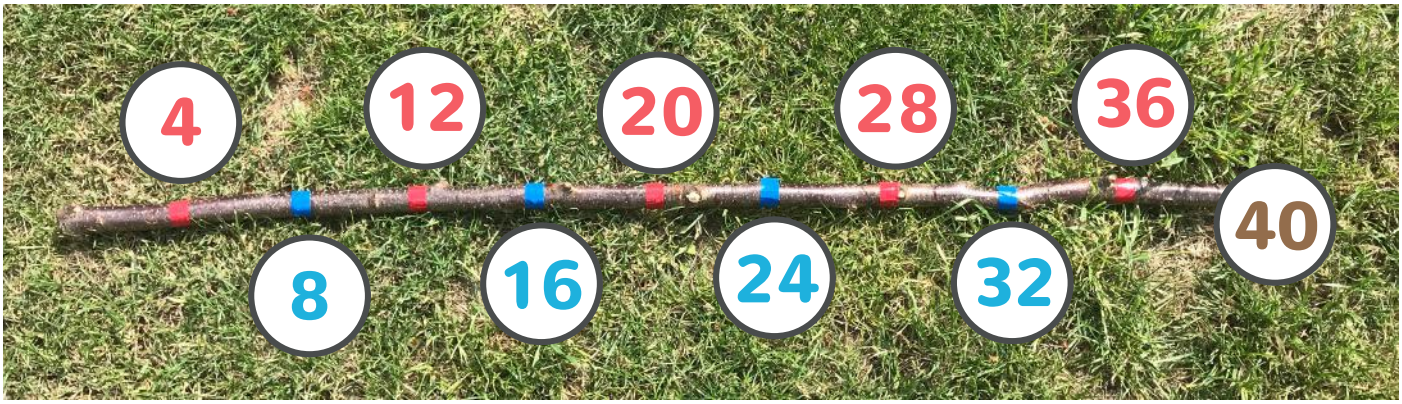
- To be able to count forwards and backwards from zero or any given number.
- To count in multiples.

Have ready

- A stick, broom handle or pole at least a metre long, OR...
- Draw a chalk line on paving slabs, or even use the edge of a table and tape.

Activity

- Using the resources, make a counting stick (no longer than a metre) and with your child work out how to divide it into 10 equal parts.
- Mark each division with a pen, tape or tie string. This is now ready for all sorts of counting.
- Each mark/division can represent whatever you want it to. Point to the division as you count.



For example, you could ...

Count in multiples of 4, 8, 50, 100

Count up and down in tenths - $\frac{1}{10}$, $\frac{2}{10}$, $\frac{3}{10}$

Use the counting stick to practise times tables

Activity two - Right angles

Key skills

- To identify right angles.

Have ready

- Right angle tester (see resources).
- Torn corner of paper.

Activity

- With your right angle tester go on a right angle hunt around the area.
- Find and draw or photograph at least 10 right angles.

Activity three - 3-digit numbers

Key skills

- To recognise the value of each digit in a 3-digit number.

Have ready

- Collect 3 different natural resources such as sticks, leaves and stones etc.

Activity

- Decide what value the resources represent e.g.

   Sticks are each worth 100.

   Leaves are each worth 10.

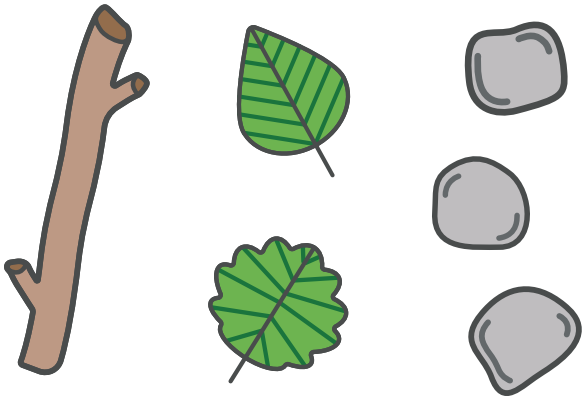
   Stones are each worth 1.

- 1 stick (100) and 2 leaves (20) and 3 stones (3) and adding these values to equal 123 (3-digit number).

- Have a go at making different 3-digit numbers. Try adding two 2-digit numbers together.

- Below, the dinosaurs are each worth 100, the marbles are each worth 10 and the pens are each worth 1. As there are 4 dinosaurs, 7 marbles and 3 pens, this represents 473.

- Here, the sticks are each worth 100, the leaves are each worth 10 and the stones are each worth 1. As there are 2 sticks, 3 leaves and 5 stones, this represents 235.



Activity four - Pebble arrays

Key skills

- To practise multiplication and division facts using materials.

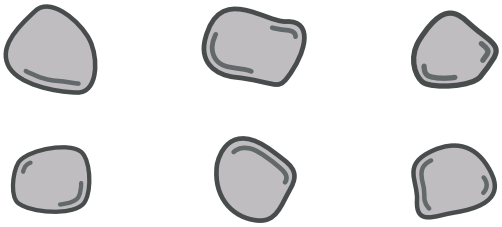
Have ready

- Lots of the same objects like pebbles, shells, pasta, beans, counters, toys.

Activity

- You are going to make an array. First decide how many objects you want in a row, for example, 3 objects. Arrange these 3 objects in a row evenly spaced out.

- Now decide how many rows you want. For example, here we have 2 rows of 3. We can also see 3 columns of 2.



- When children are making arrays they must make sure that each row has the same number, each column has the same number and they are evenly spaced. We can now link this to multiplication.

$1 \times 3 = 3$

$2 \times 3 = 6$

Or

$3 \times 1 = 3$

$3 \times 2 = 6$

- You can continue to keep adding rows.
- Children need lots of practice with making and describing their own arrays using the language explored in the example. This is an ideal way to practise multiplication and division facts.

Activity five - Follow the line

Key skills

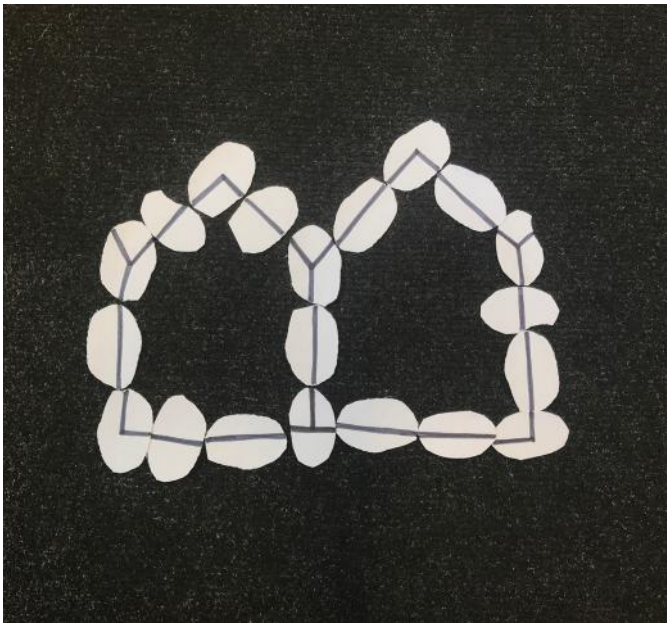
- To create a pattern.

Have ready

- Pebbles, scrap paper cut into ovals/circles.
- Paint, chalk, pen, markers.

Activity

- This activity gives your child the opportunity to explore and be creative. You can ask questions related to shapes they make, length and direction.
  - Draw a straight line across some of the pebbles.
  - Draw two lines meeting to form a right angle.
  - Draw 3 lines forming to make a 'Y'.
  - Draw 2 lines forming to make a 'T'.
- Now let your child explore what they can make by joining the lines up. What can the lines make?



Need inspiration?
Why not try these...

Rectangle
House
Plus sign
Car
Your name

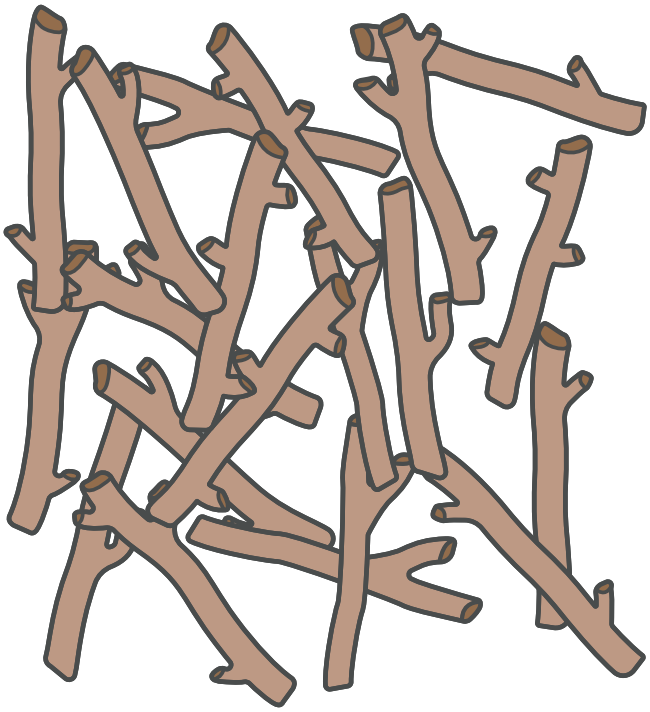
Activity six - Pick up sticks

Key skills

- To develop spatial awareness, fine motor control and develop mathematical vocabulary.

Have ready

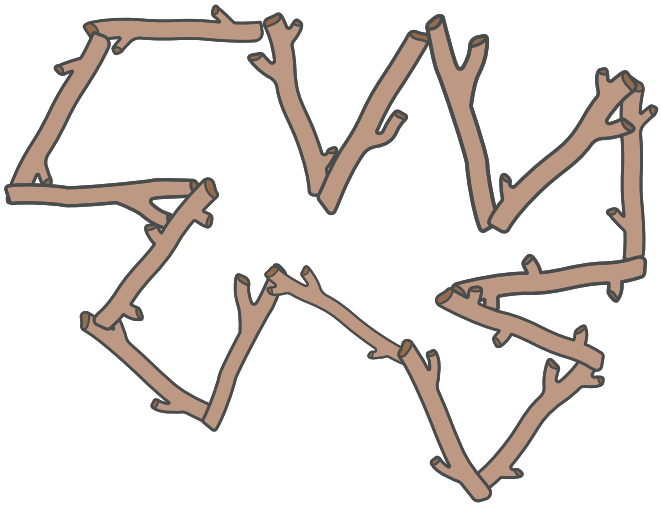
- About 20 sticks or alternatives.
- At least two players.

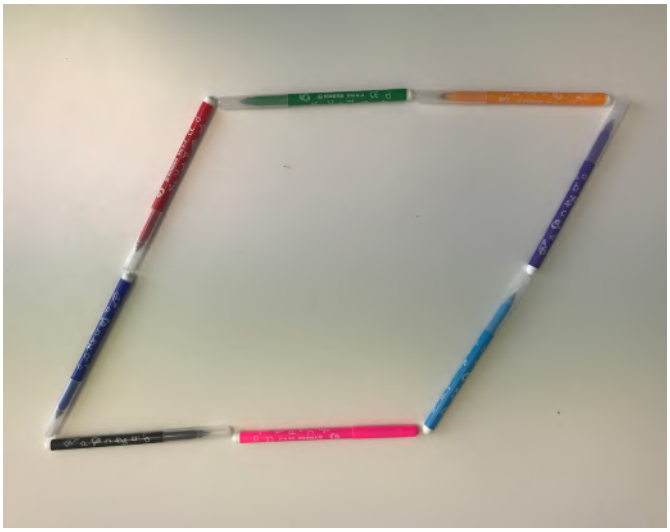


Activity

- Get about 20 sticks and drop them into a pile.
- Take it in turns to remove a stick without moving any others. You could ask what shapes you see when you look down at the pile.

Activity seven - What shapes can you make?





- Can you make shapes with these properties using sticks?
  - Two pairs of parallel sides.
  - One pair of parallel lines.
  - The lengths of the sides are not all equal.
  - A shape with 1 right angle.
  - Two lines of symmetry.

Key skills

- To draw and make 2D shapes using materials.

Have ready

- A selection of sticks or alternatives.
- Paper and pencil.

Activity

- Make as many different shapes as possible.
- What are the properties of each shape? Consider the length and number of the straight sides and the size and number of the angles.
- What are the angles? (Right angle, acute and obtuse). Which angle is greater? Which is less? Can you make more than one shape with the same properties?
- Which shapes have only parallel lines? Which shapes have only perpendicular lines? Which shapes have both parallel and perpendicular lines?

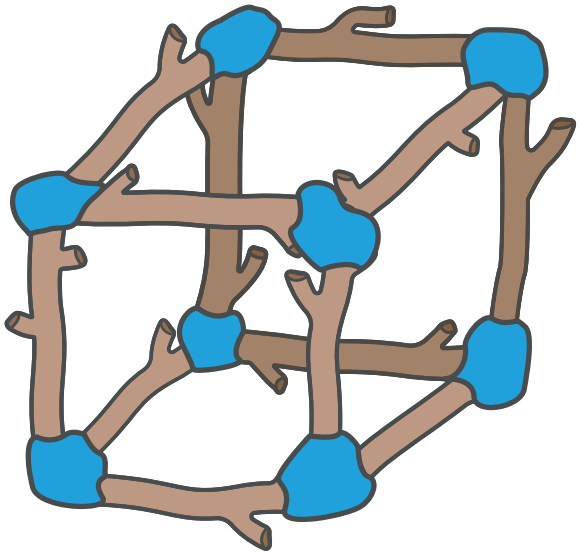
Activity eight - 3D shapes

Key skills

- To draw and make 3D shapes using modelling materials.

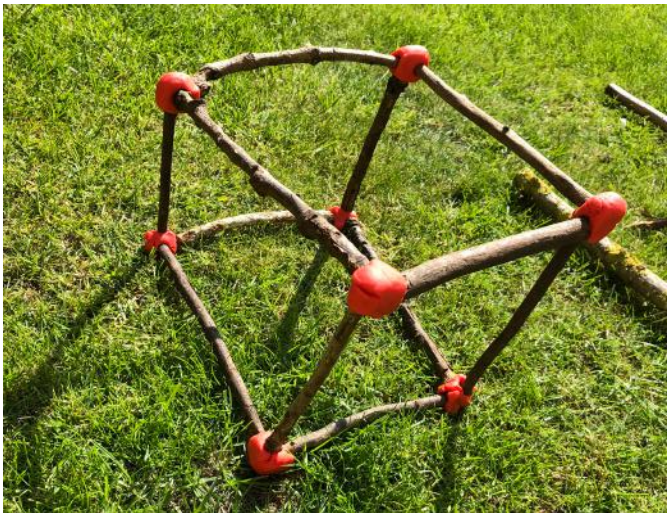
Have ready

- Sticks.
- Plasticine/playdough/tape.



Activity

- Look around - what 3D shapes do you see?
- Make a 3D cube using sticks. Join the corners together using plasticine or tape. How many sticks did you use to make it?
- For example, this shape is made with 12 sticks.



- "I am made with 9 sticks. What 3D shape could I be?"

You could even leave the 3D shape outdoors as a mini-beast home!

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Activity nine - The trunk of a tree

Key skills

- To measure lengths using millimetres (mm), centimetres (cm) and metres (m).

Have ready

- Tape measure.
- Ruler and string.

Activity

- Look around you and measure different things you see. How many mm, cm or m are they?
- The length of a leaf? A shell? A pebble? A stick? What about the girth of a tree trunk?

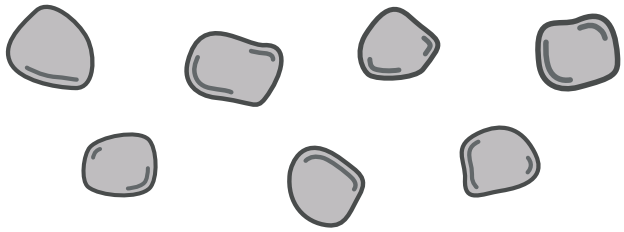
Activity ten - Nim

Key skills

- To problem solve.

Have ready

- Seven objects like stones, sticks, counters.
- It is a game for two players.



Activity

- To play the ancient game of Nim, place the 7 objects in a pile and decide who will go first. In the next game, the other player will go first.
- Each player takes turns to take away either one or two objects.
- The player who takes the last object wins.
- Keep playing until you work out a winning strategy.
- Think about; Does it matter who has the first turn? What happens when you start the game with more objects?

Activity eleven - Fraction walls

Key skills

- To compare and order unit fractions.

Have ready

- Sticks of different lengths.

Activity

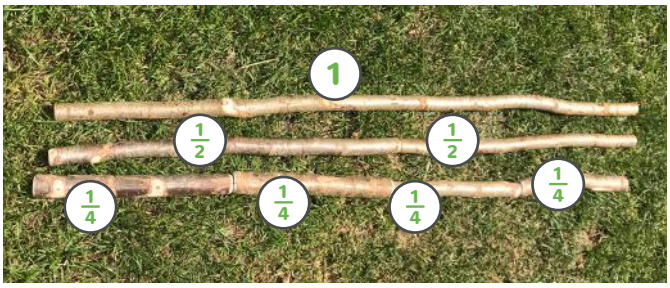
- Place the longest stick you have on the ground.
- Find a stick half that length, then find another stick half that length again.
- Then start to label – 1 whole, $\frac{1}{2}$, $\frac{1}{4}$.

You could even start to work out fraction calculations:

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

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

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



Activity twelve - Follow the trail

Key skills

- To describe position, direction and movement.

Have ready

- Sticks or alternatives.

Activity

- Lay a trail of sticks through woods, the park, your garden or even in your home.
- Agree a trail code, for example, cross sticks means dead end, arrow turn left or right or straight ahead.
- Use positional language to describe how you get through your trail.

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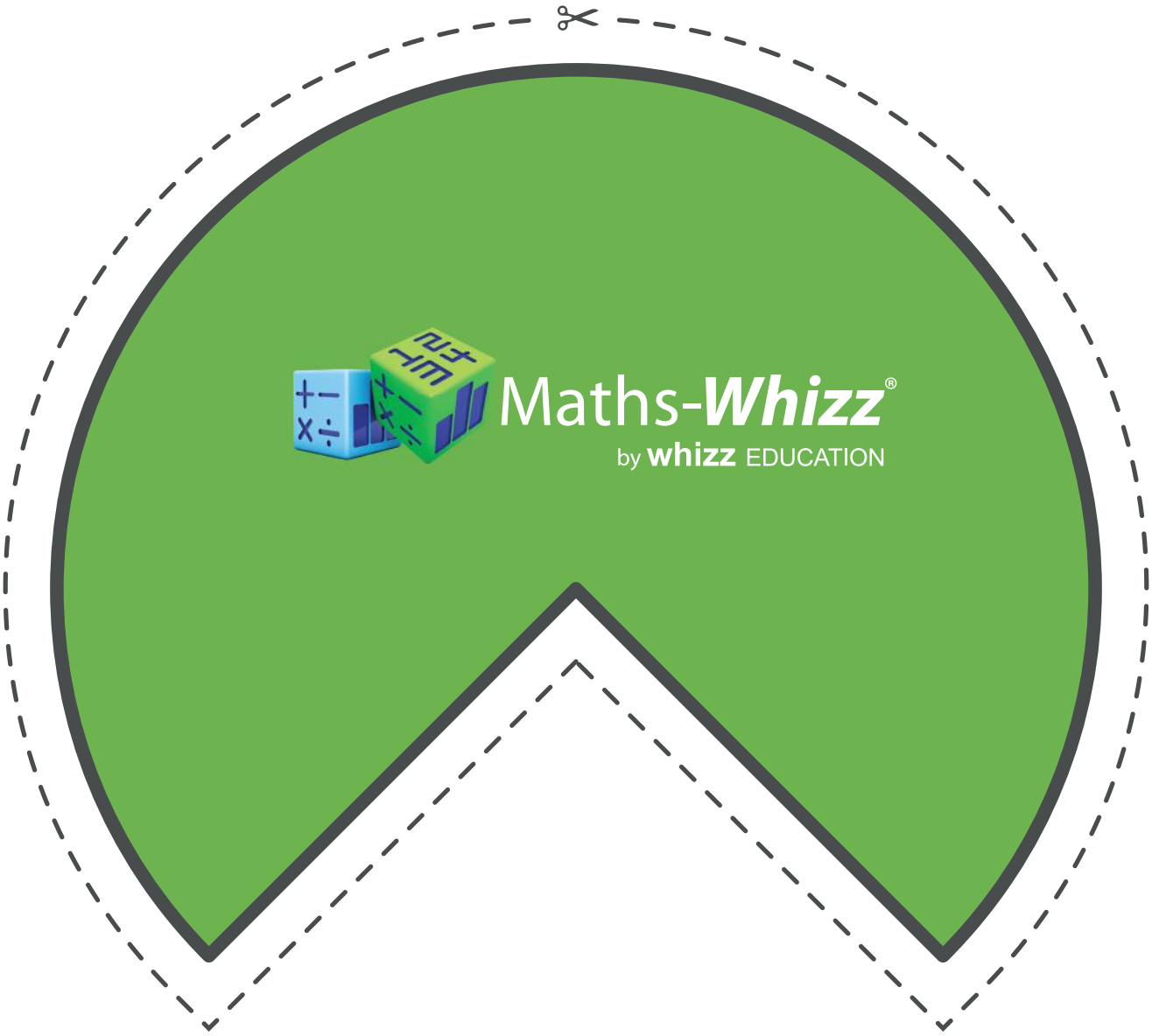
Resources

Right-angle tester



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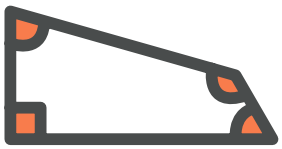
Glossary

Glossary

Acute angle

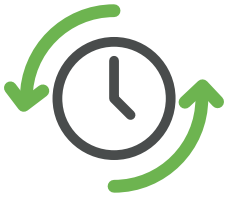
An angle smaller than a right angle. It is an angle between 0° and 90°.

Angle



An amount of turn. Angles are measured in degrees.

Anti-clockwise

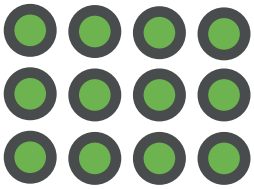


Turning the opposite way to the clock.

Area

The area of a shape is a measure of how much surface it has.
Area = length x width

Array

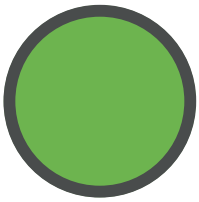


A regular arrangement of numbers or objects. It has rows and columns usually in the form of a rectangle.

Ascending

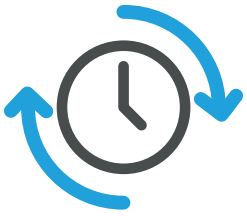
Going up or increasing in order from smallest to largest.

Circle



A shape with every point at its edge at exactly the same distance from the centre.

Clockwise



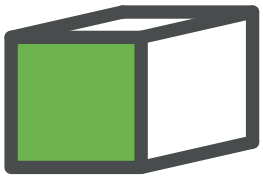
Turning the same way as a clock.

Corner

A corner is a point where two or more lines meet.

Glossary

Cuboid



Solid shape with six rectangular faces.

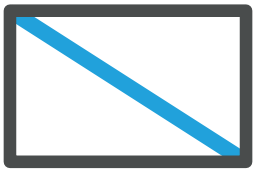
Denominator

The number below the line in a fraction.

Descending

Going down or reducing in size.

Diagonal



A straight line that joins any two corners which are not adjacent.

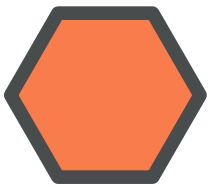
Diameter

A line that passes from one side of a circle through the centre to the other side.

Half

One of two equal parts. When something is divided into two equal parts, each part is one half.

Hexagon

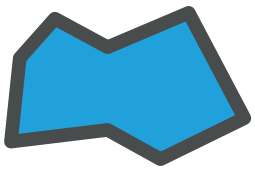


Any polygon with six straight sides.

Horizontal

Same direction as the horizon.

Irregular polygon



Shapes that do not have all their sides the same length. They have different sized angles.

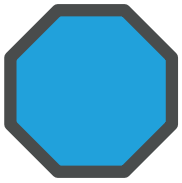
Numerator

The number above the line in a fraction.

Obtuse angle

An angle that measures between 90° - 180°.

Octagon



Any polygon with eight straight sides.

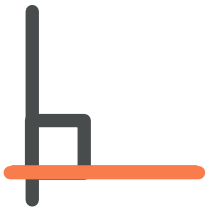
Parallel lines

Lines that stay at the same distance apart.

Perimeter

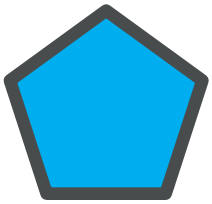
The distance around the outside of the shape.

Perpendicular lines



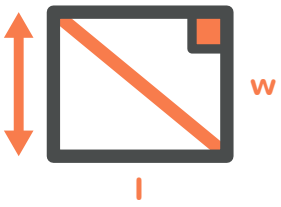
One line is at right angles to another line.

Polygon



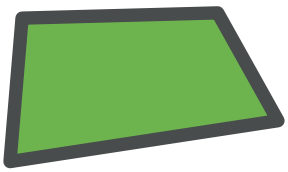
Any 2D shape with straight sides. Polygons can be regular or irregular

Property



A property of a shape is a particular fact or feature of it that makes it part of a group with the same properties.

Quadrilateral



Any polygon that has four sides. The four angles add up to 360°.

Glossary

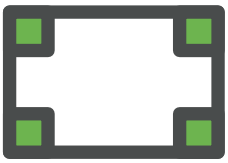
Quarter

Is one of four equal parts.

Radius

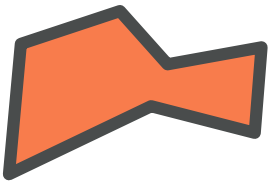
Is the length of a straight line from the centre of a circle to its circumference.

Rectangle



A four-sided flat shape. It has two pairs of opposite, equal parallel sides and each angle is a right angle.

Rectilinear



A rectilinear shape is a shape whose edges are all straight lines. All polygons are rectilinear shapes.

Right angle

An angle of 90°. It is a quarter turn.

Side

A side of a shape is the line that forms part of the edge or perimeter.

Square

A flat shape with four straight and equal sides. The angles in its corners are all right angles.

Square-based pyramid

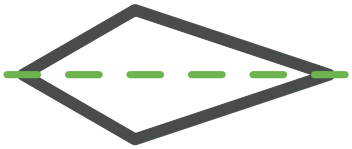
Has a face that is square and the other four faces are triangles.

Straight lines

A straight line is half a turn. It is two right angles.

Glossary

Symmetry

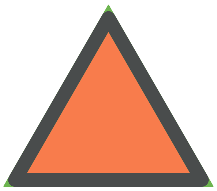


The ‘Line of Symmetry’ is the imaginary line where you could fold the image and have both halves match exactly.

Three-dimensional shape

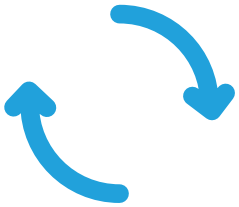
Three-dimensional shapes are solid shapes.

Triangle



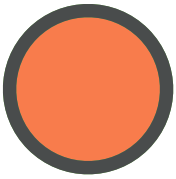
Any polygon with three sides. The angles of a triangle add up to 180°.

Turn



When something turns it spins, rotates, revolves, or whirls.

Two-dimensional shape



Two dimensonsal shapes are flat shapes.

Unit fraction

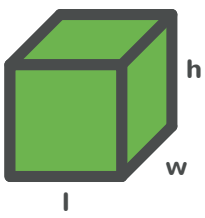
$$\frac{1}{x}$$

Has a numerator of 1 and any number as a denominator.

Vertical

At right angles to a horizontal line.

Volume



Volume of an object is the amount of space it fills. To find the volume you multiply the length by the width by the height.
Volume = l x w x h