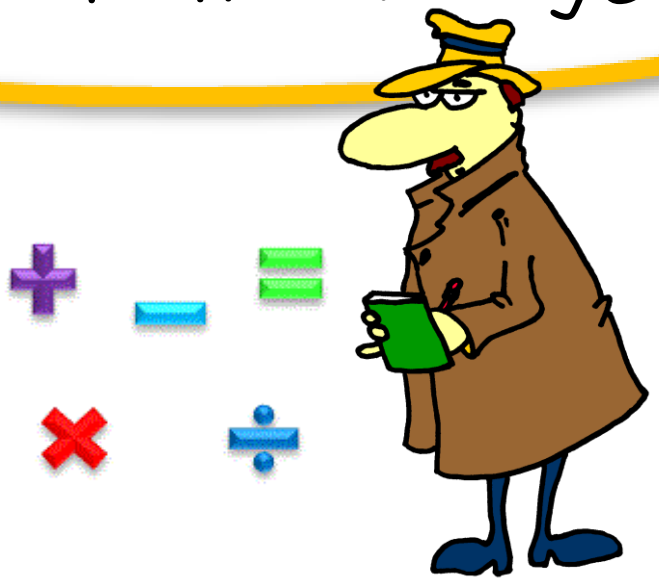
20 non-digital maths activities using everyday resources for learners from 4 to 11 years



All of the activities use everyday resources that can easily be found both at home or in school.

Each activity has suggestions for increasing difficulty from N to Y6 so are perfect for mixed-age classes or groups of learners.

www.cullyeducation.co.uk

Number

Spot the number

On your daily walk challenge each other to find specific numbers on vehicle number plates.

Top Tip

Talk about what the next number will be to support your child if they find it difficult.

Progression

Consecutive numbers to 5, i.e. 1, 2, 3, 4, 5
Consecutive numbers to 10, doubles and halves, bonds to 10, e.g. see 6 find 4 next.
Numbers to 20, doubles and halves, bonds to 20, e.g. see 16 find 4 next. Odd or even numbers, e.g. 1, 3, 5, 7,
Numbers to 100, doubles and halves, multiples of 2, 5 and 10, Odd or even numbers, e.g. 1, 3, 5, 7,
Multiples of 3 and 4
Multiples of 6
Multiples of 8, prime numbers below 10, i.e. 2, 3, 5, 7,
Multiples of 7 and 9, prime numbers below 20, , i.e. 2, 3, 5, 7, 11, 13, 17, 19, square numbers, e.g. 1, 4, 9, 16, 25,

Number

Target number

- Draw 4 circles on the floor or place pieces of clothing on the floor to make goals. Label each circle/goal with a value, e.g. +1, +10, x5. Choose a target number to achieve, e.g. 22. Throw a rolled up sock at the goals trying to get as close to the target number as possible.

Top Tip

Increase the challenge by adding extra rules like the player who throws the last beanbag is the winner.

Progression

Just have one circle with +1 and a target number under 5
Circles with +1, double, half and a target number under 10
Circles with +1, double, half and a target number under 20
Circles with +1, -1, +10 double, half, x2, x5, x10 and a target number under 100
Circles with +1, -1, +10 double, half, x2, x3, x4, x5, x10 and a target number under 1000
Circles with +1, -1, +10 double, half, x2, x3, x4, x5, x6 x10 x100 and a target number under 10, 000
Circles with +1, -1,, x2, x3, x4, x5, x6, x8, x10, divide by, and a target number under 100, 000 or to 1 or 2 decimal places
Circles with +1, -1,, x2, x3, x4, x5, x6, x8, x10, divide by, and a target number under 1000, 000 or to 3 decimal places

Number

What's my number?

Write a number on a post it and stick to each players forehead (or give a number to each player placing it face down so that they can't see it. Tell them a statement about the numbers. The winner is the first player to work out their own number.

The sum of your numbers is 10

Top Tip

Increasing the number of players makes the game more difficult.

Progression

Numbers under 5
Numbers under 10
Numbers under 20
Numbers under 100
Numbers under 1000
Numbers under 10, 000
Numbers under 100, 000 or to 1 or 2 decimal places
Numbers under1000, 000 or to 3 decimal places

Number

Bingo

Each player writes down 12 numbers. Players can cross off numbers according to the rules agreed, e.g. for x2 bingo, players would cross off the number that was x2 the number called.

Top Tip

Players can choose 24 numbers to make it harder. Keep numbers under 50 or the game will never end.

Recording the numbers in a 6 by 4 grid means that players can win when they complete a line as well as when they have a full house.

Progression

Just 4 numbers between 0-5 and show quantities, e.g show 5 sweets
Just 6 numbers between 0 and 10
Numbers under 20
Numbers under 50, rules = +1, -1, +10 double, half, x2, x5, x10
Numbers under 50, rules = +10 double, half, x2, x3, x4, x5, x10
Numbers under 50, rules = +1, -1, +9, double, half, x2, x3, x4, x5, x6 x10
Numbers under 50, rules = +9, +11,, x2, x5, x10 x2, x3, x4, x5, x6, x8, x10, divide by,
Numbers under 50, rules = +9, +11,, double, half, x2, x5, x10 x2, x3, x4, x5, x6, x8, x10, divide by,

Number

Disappearing Tables.

Write the answers to a multiplication table down and practice reciting the tables pointing to the answers as you go.

X5

5 10 15 20 25 30 35

40 45 50 55 60

Each time you recite the table, remove one of the answers (great fun if you use chalk and a water pistol).

Top Tip

Make sure you say the whole multiplication sentence, e.g. 1x5 is 5.

To make sure you really know your tables repeat the process but jump around the answers saying them out of turn.

Progression

Recite X2
Recite X10
Recite X5
ReciteX4, X3
Recite X6
ReciteX8
Recite X9
Recite X7

Number

Pasta arrays

Choose a times table to learn and create arrays for each fact using items in your kitchen, e.g. pasta shapes, seeds or currants

1x2 2x2 3x2 4x2 5x2

Top Tip

Make sure you say the whole multiplication sentence, e.g. 1x5 is 5.

Don't forget to ask questions out of order. Extend learning by asking for the division sentence too, e.g. 3X2=6, 6÷3=2

Progression

Recite X2
Recite X10
Recite X5
ReciteX4, X3
Recite X6
ReciteX8
Recite X9
Recite X7

Number

Multiplication catch (individually, pairs or small groups)

Choose a times table to practice. Throw and catch a ball (or rolled up socks) whilst reciting the table. Each player has to say a times table sentence and then throw and catch the ball in the air to show the answer, e.g. 3x5 the player would have to throw and catch the ball 15 times.

If you don't know the answer, drop it or get it wrong, you have to start again. How high can you go?

Top Tip

Once you can do this reciting the table in order, mix it up by saying the table facts randomly or mix up the multiplication tables, e.g. 2X6, 4X3, 8X7

Progression

Recite X2
Recite X10
Recite X5
ReciteX4, X3
Recite X6
ReciteX8
Recite X9
Recite X7

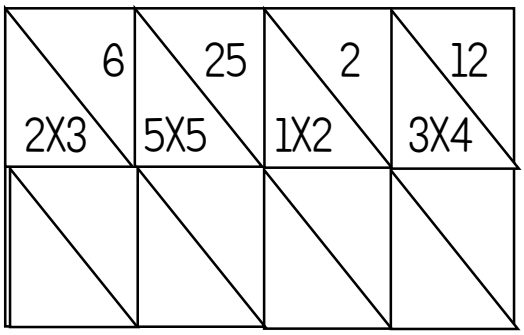
Shape & Number

Packet puzzle

Cut up a cereal packet to make a puzzle for your child to complete.

Top Tip

Extend the task by writing number facts and answers on the back of the puzzle (going across the puzzle). Ask children to put the puzzle together using only the number facts. Cellotape the pieces in place, then turn in over to see if they are correct.



Progression

Match numbers to quantities, e.g. 2 =
Number facts to 5, e.g. 1 + 2 = 3
Number facts to 10, e.g. 2 + 8 = 10
Use number facts to 10, e.g. 20 + 80 = 100, X2, X5 or X10 facts
Number facts to 20, e.g. 16 + 4 = 20, X4 or X3 facts
Number facts to 20, e.g. 16 + 4 = 20, X6 facts
Number facts to 20, e.g. 16 + 4 = 20, X8 facts
Number facts to 20, e.g. 16 + 4 = 20, X7 or X9 facts

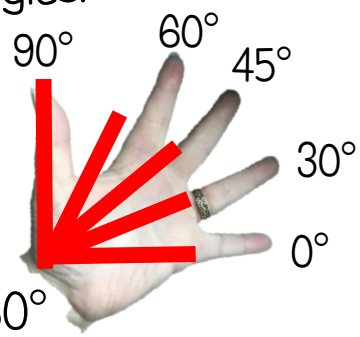
Shape

Angle finder

Find given angles or work out what an angle is, around the house or on your daily walk. Ask children to tell you what they can see if they turn, e.g. If you make a half turn, what are you facing? Try directing each other around the house using angles!

Top Tip

You can use your hand to help you estimate angles.



Don't forget:

Right angles = 90°

Acute angles = less than 90°

Reflex angles = more than 180°; less than 360°

Obtuse angles = more than 90°; less than 180°

Progression

Given directions, e.g. right, left
Whole turns and half turns
Half and quarter turns anti clockwise and clockwise
Recognise quarter turns are right angles
Right angles
More or less than a right angle
Acute and obtuse angles within 10°
Reflex angles within 5°

Shape

Triangle Sticks

Collect 9 equal-sized sticks. You could use twigs, matchsticks, lolly sticks or pencils.

How many triangles can you make?

What is the highest number of triangles you can make?

Top Tip

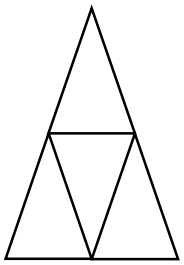
Don't forget to count both big and small triangles.

Equilateral triangle = 3 sides of equal length; all angles are 60°.

Right-angled triangle = One right-angle; 2 acute angles

Isosceles triangle = 2 sides of equal length.

Scalene triangle = All 3 sides having different lengths.



Progression

Just use 5 sticks.
What is the largest/smallest triangle you can make?
How many equilateral triangles can you make?.
How many right-angled triangles can you make?
How many isosceles triangles can you make?
How many scalene triangles can you make?
Can you make a triangle with double/half the perimeter?
How many triangles can you find with different numbers of sticks. Can you find any patterns or rules?

Shape

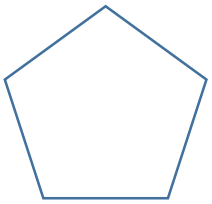
Shape Sticks

Collect some sticks. You could use twigs, matchsticks, lolly sticks or pencils.

Use the sticks to create regular and irregular shapes. Is it easier to make regular or irregular shapes? Why?

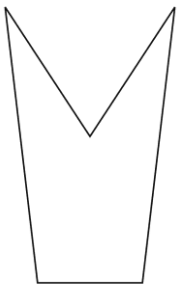
How many of each shape can you make?

Top Tip



Regular shapes – all the sides are the same length and all the angles are the same. e.g. a regular pentagon

Irregular shapes – the sides can be different lengths and the angles can all be different. e.g. an irregular pentagon



Progression

Make squares and triangles.
Make squares, triangles and rectangles.
Include pentagons (5 sides) and hexagons (6 sides)
Include octagons (8 sides)
Include different types of quadrilaterals (4 sided shapes), e.g. rhombus, parallelogram

Shape

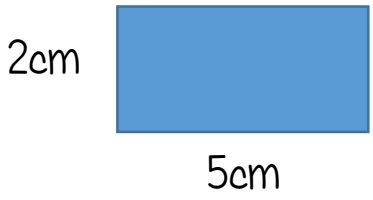
Perimeter

Give learners the perimeter of a regular shape. They have to work out what shapes it could be.

A point is awarded for each correct shape, e.g. Perimeter 24 could be a hexagon with sides 4cm, a square with sides 6cm, a triangle with sides 8cm or an octagon with sides 3cm.

Top Tip

Perimeter is the distance around a shape.



Perimeter = 2cm + 5cm + 2cm + 5cm = 14 cm

Choose numbers with lots of factors like 24, 30, 36, 40, 48

Progression

Just squares and triangles. Use perimeters 12, 24, 36, 48
Just squares, triangles and rectangles.
Include pentagons (5 sides) and hexagons (6 sides)
Include octagons (8 sides)
Any shape

Shape

Plasticine

Ask children to make a sphere out of plasticine (or bluetac, pastry, or marzipan – anything pliable) and explore its properties.

How many sides, corners, angles, lines of symmetry etc.?

What 2D shape they can see if they hold it in front of them.

Top Tip

What do they know in real life that looks like the shape they have made? Change it into another shape. What have you changed? Number of sides, shape of faces etc.

Progression

Make a sphere, cube and cuboid.
Make a sphere, cube, cuboid and cone.
Make a sphere, cube, cuboid and cone. Talk about right angles.
Make a sphere, cube, cuboid. and cylinder
Make a sphere, cube, cuboid. and prisms
Make a sphere, cube and cuboid. tetrahedra (triangular pyramid) and square-based pyramid

Measures

Capacity Task

Estimate the capacity of different mugs and bowls

Top Tip

Use visualisation to develop estimating capacity skills, e.g.

I know this bottle is 1 litre and I think I could fit 3 bottles in this pot so the pot has a capacity of about 3 litres.

Progression

Pour water from the bottle into the pot to compare the two.
Discuss which pots hold more or less.
Use non standard measures to talk about capacity, e.g. I think the pot holds 3 bottles of water.
Use litres (l) to talk about capacity, e.g. This bottle holds one litre of water so I think the pot holds about 3 litres.
Use litres, ½ litres and 100millilitres (ml) to talk about capacity, e.g. This bottle holds 1 litre of water so I think the pot holds 3½ litres.
Use 100ml and 50ml to talk about capacity, e.g. This bottle holds one litre of water so I think the pot holds about 3 litres 450ml.
Use decimal notation to talk about capacity, e.g. This bottle holds one litre of water so I think the pot holds about 3·5 litres.
Talk about capacity measurements in different ways, e.g. I think it holds 3·5l which is 3½ litres or 3 litres and 500 ml

Measures

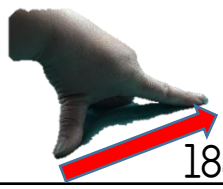
Length Task

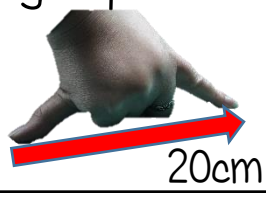
Find something that is...longer/shorter than or ...about 20cm

Top Tip

If you don't have a ruler, use your body to measure. The width of your palm is about 10 cm. An average foot is about 26 cm long.

The distance of your forearm from elbow to fingertip is approximately 46 cm.





Progression

Put two objects side by side to compare them.
Discuss which objects are longer or shorter.
Use non standard measures to talk about length, e.g. I think the book is 3 biscuits longer than the pen.
Use metres, ½ metres and centimetres (cm) to talk about length e.g. This daffodil is about 20cm tall.
Use ½ centimetres to talk about length, e.g. This daffodil is about 19½ cm tall.
Use millimetres (mm) to talk about length & record in mixed units, e.g. This daffodil is 195 mm tall. I can write that as 19cm 5 mm.
Use decimal notation to talk about length e.g. This daffodil is about 19·5 cm tall.
Talk about length measurements in different ways, e.g. I think it is 19·5 cm tall which is 195mm or 19 cm and 5 mm.

Measures

Investigations

Challenge children to investigate statements to see if they are true, e.g. Arm span is equal to leg length.
The bigger the shoe size, the longer the leg length.
Our arm span is approximately equal to our height.
We can jump the length of our legs.
Investigate to see if they are true. Can you find other truths?

Top Tip

Keep a record of the investigation so that they can check their results. If you don't have a ruler, measure using non-standard units like the width of your hand, a pencil or create your own paper ruler.

Progression

Measure in non-standard units like a shoe or conker. Compare 2 measurements at a time.
Measure in non-standard units like a shoe or conker. Discuss longer and shorter measurements.
Measure in metres, ½ metres or centimetres.
Measure to the nearest centimetre.
Measure to the nearest millimetre and record in mixed units, e.g. 1 cm 4mm
Record using decimal notation, e.g. 1.·4 cm
Record in different ways, e.g 1.·4 cm, 1cm 4mm, 14mm

Measures

Which Unit?

Brainstorm as many items as possible that would be measured in a given unit, e.g. kilograms, centimetres, litre.
Each sensible item that the other players do not have (or that is not on a list if there is only one player), scores a point.

Top Tip

Think about whether the items listed are appropriate for the type of measurement, e.g. litres – liquid

Think about whether the size of the item is appropriate for the unit, e.g. m – glass of water

Progression

Give a non-standard measure like a shoe or glass
Give measures like metres, centimetres, kilograms, 10 grams or litres
Add measures like ½ centimetres, 5 and 100 grams, ½ litres and 100 millilitres
Add measures like 25 grams and 50 millilitres
Add fractions of measures, e.g. ¼ of a litre
Add imperial units, e.g. pint, mile

Measures

Shadows

Draw around your child's shadow then get them to lie down and draw around their body. Measure the length of the shadow and the body outline. Which one is longer?
Repeat throughout the day recording times and measurements.
Did the length of the shadow change?
What about the length of the body?
At what times was the shadow the shortest and the longest?
Are there any times you don't have a shadow?
When is you shadow twice as long as you?

Top Tip

Explain that the length of the shadow depends on the location of the sun. The higher the sun is in the sky, the smaller the shadow will be.

Did you know that the length of your shadow also changes with the seasons?

Progression

Measure in non-standard units like a shoe or conker.
Measure in non-standard units like a shoe or conker. Discuss longer and shorter measurements.
Measure in metres, ½ metres or centimetres.
Measure to the nearest centimetre.
Measure to the nearest millimetre and record in mixed units, e.g. 1 cm 4mm
Record using decimal notation, e.g. 1.·4 cm
Record in different ways, e.g 1.·4 cm, 1cm 4mm, 14mm

All Areas of Maths

Concept Gallery

Challenge your child to show you a maths concept in as many different ways as they can, e.g. To show 5







Top Tip

Encourage learners to see the concept in as many contexts as possible, e.g. number, measures, money, shape

Progression

Show: numbers 0 to 5, hot/cold, circle, square, triangle
Show: numbers 0 to 10, hot/cold, circle, square, triangle
Show: numbers 0 to 20, double/half to 10, odd/even, rectangle, cube
Show: numbers 0 to 100, double/half/quarter to 20, cuboid, sphere
Show: 0 to 1000, halves to 100, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{5}$, number facts to 20
Show: halves to 1000, $\frac{1}{6}$, $\frac{4}{5}$, $\frac{3}{4}$, $\frac{2}{3}$, right angles
Show: prime numbers to 10, decimals, $\frac{1}{8}\frac{4}{6}$, acute & obtuse angles
Show: square numbers, prime numbers to 20, percentages, $\frac{1}{7}$, $\frac{1}{9}\frac{5}{8}$, reflex angles

All Areas of Maths

Llygaid Mathemateg

Put on your 'Maths Eyes' and see the maths in the world around you. Ask children to find maths in a picture or in their surroundings, e.g. In this picture you could find 4 panes,

squares, rectangles, right-angles, parallel and perpendicular lines

Top Tip

Start by asking specific questions, e.g. Can you see a square? Move onto asking what maths they think you might have seen and getting them to set you questions. Lots of pictures and questions available at www.cullyeducation.co.uk/projects

Progression

Look for circles, triangles and squares. Numbers to 5
Look for rectangles, spheres, cubes and cuboids. Numbers to 10
Look for semi-circles and cones. Numbers to 20
Look for 2D and 3D shapes, symmetry and right angles.
Look for cylinders, fractions
Look for perpendicular and parallel lines
Look for acute and obtuse angles, prisms, congruent shapes (
Look for reflex angles, tetrahedra (triangular pyramid) and square-based pyramids