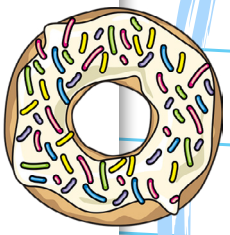
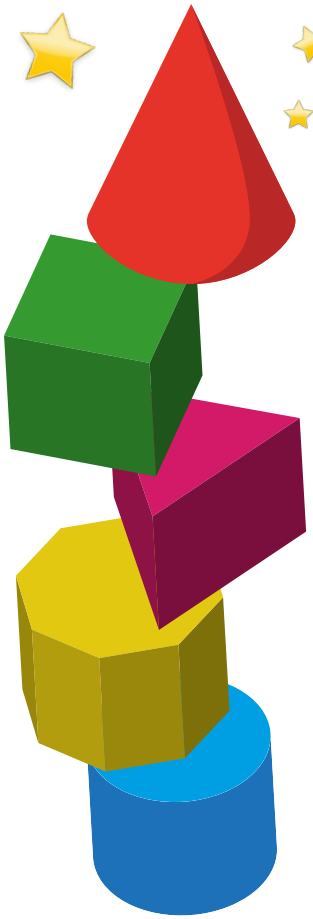
TheSchoolRun.com

# Year 3 Maths Challenge Pack





# Using the Y3 maths Challenge Pack with your child

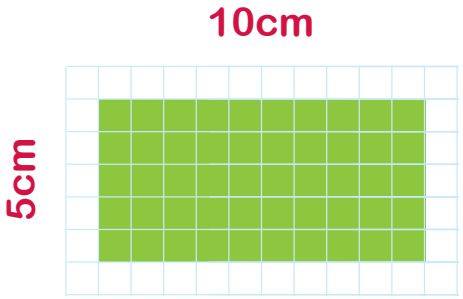
If your child is confident with all the areas of the Year 6 maths curriculum they will begin working on activities described as ‘greater depth’. At school teachers are now encouraged to keep within the topics covered in their year group but to challenge and stretch more able children by giving them different activities to help them explore and investigate topics further (you may hear the term “embedding knowledge”).

In this pack are a range of activities designed to get your child thinking and puzzling over their maths in a fun and creative way. The idea is to investigate and experiment with different ways of thinking and apply this to their learning. Be aware that the activities may take longer to complete than they are used to and may have more than one solution!

# Playing with perimeter

Can you use the squared paper below to make as many quadrilaterals as you can with a perimeter of 30cm? Remember, perimeter is the distance all the way round the outside of a shape. To calculate the perimeter you need to add together the measurements of all the sides.

The first one has been done for you:



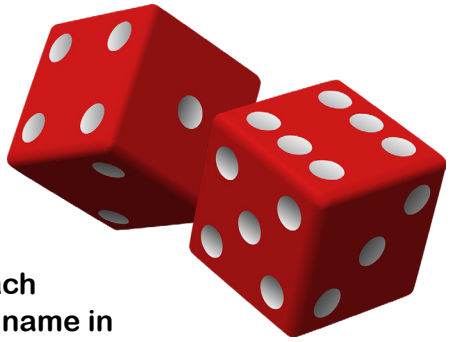

Represents a 1cm square

Perimeter = 10 + 5 + 10 + 5 = 30cm

**CHALLENGE** How do you know you have found all the quadrilaterals possible? Can you think of a logical way of making sure?

Answers: There are 7 different quadrilaterals.

# Mental maths: adding and subtracting two-digit numbers



You need two players and two dice for this challenge.

Player one rolls the dice and creates a two-digit number, then rolls again to create a second number.

Both players need to add the numbers together in their heads. The first person to reach the correct answer is the winner; record their name in the chart below, then swop so the other player rolls the dice.

As a variation, find the difference between the two numbers.

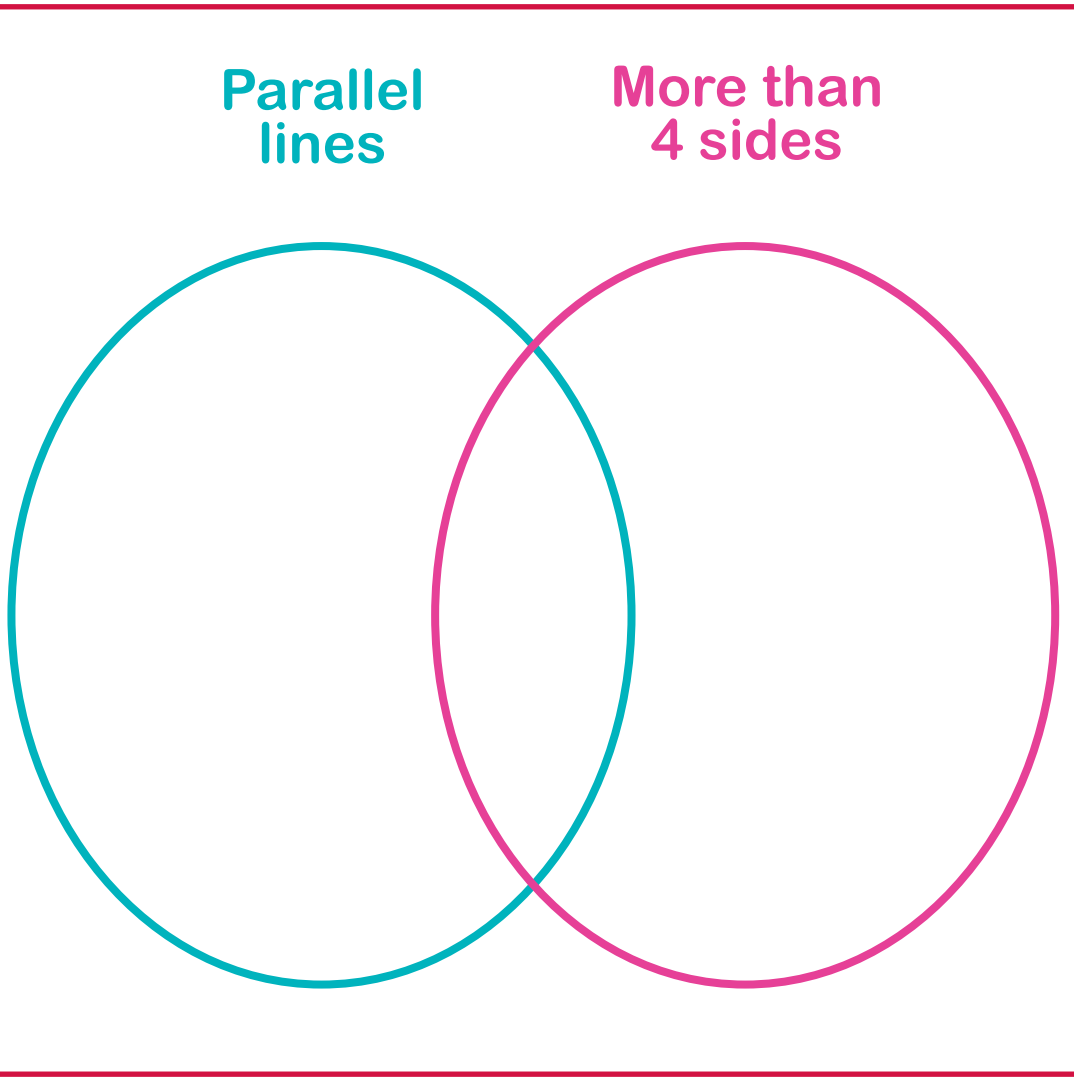
| | Winner = Player 1 | Winner = Player 2 |
|---|---|---|
| Game 1 | | |
| Game 2 | | |
| Game 3 | | |
| Game 4 | | |
| Game 5 | | |
| Game 6 | | |
| | Total | Total |

**PARENT TIP!**

Use a calculator to check the calculations are correct and get some calculator practice too!

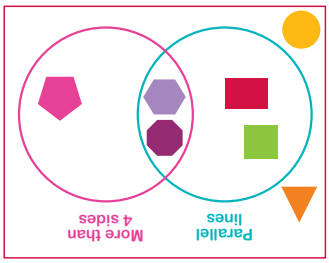
# Venn diagrams: sorting shapes

Can you cut out and stick each shape into the correct place in the Venn diagram?




Can you identify and name each shape?

Point out the rectangle, square, circle, triangle, pentagon, hexagon and octagon to a grown up, then ask them to show you where each one is.

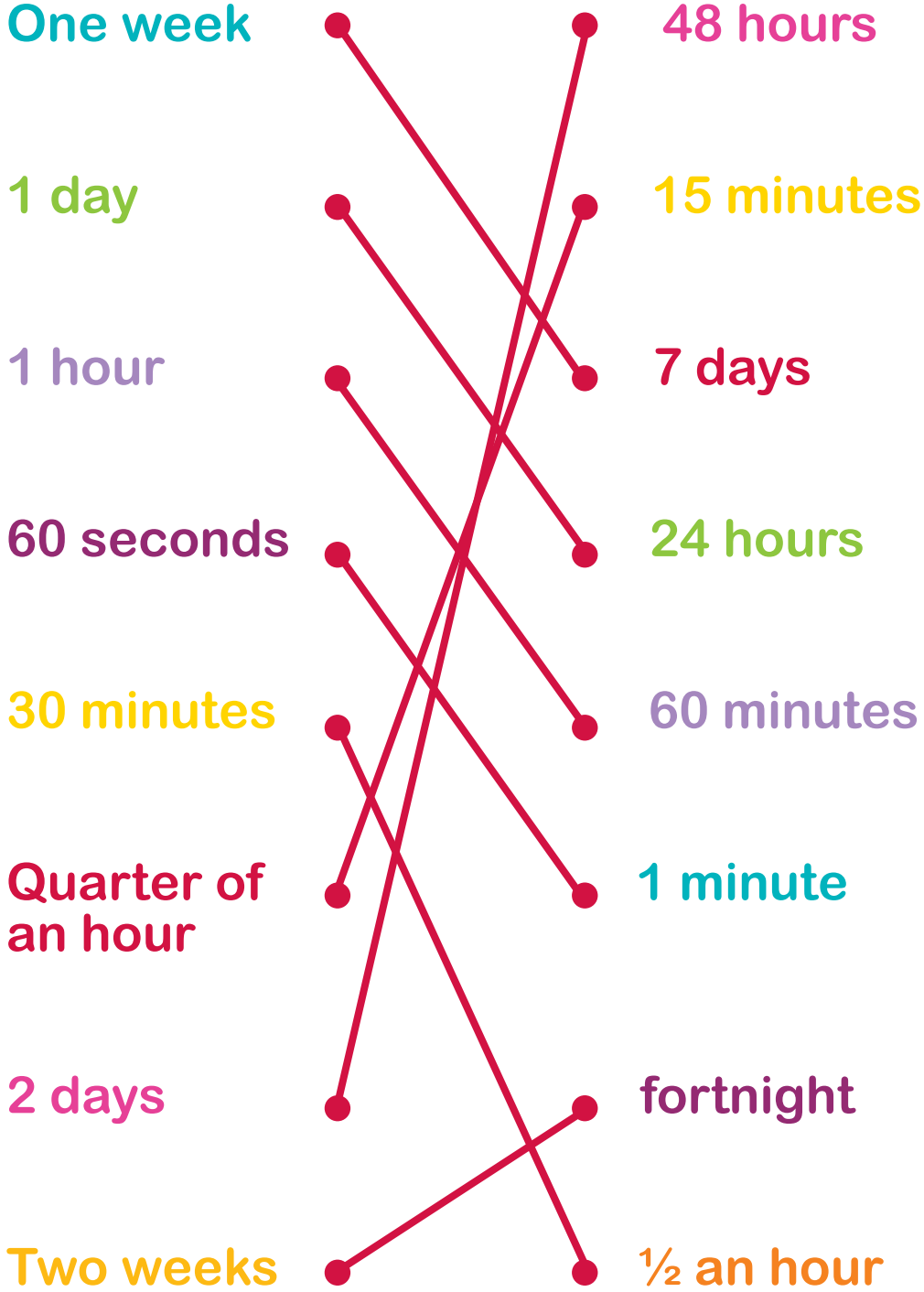


# Matching times

Use a pencil and ruler to draw lines to match the equivalent times.

| | | | |
|---|---|---|---|
| One week | ● | ● | 48 hours |
| 1 day | ● | ● | 15 minutes |
| 1 hour | ● | ● | 7 days |
| 60 seconds | ● | ● | 24 hours |
| 30 minutes | ● | ● | 60 minutes |
| Quarter of an hour | ● | ● | 1 minute |
| Two days | ● | ● | fortnight |
| Two weeks | ● | ● | ½ an hour |

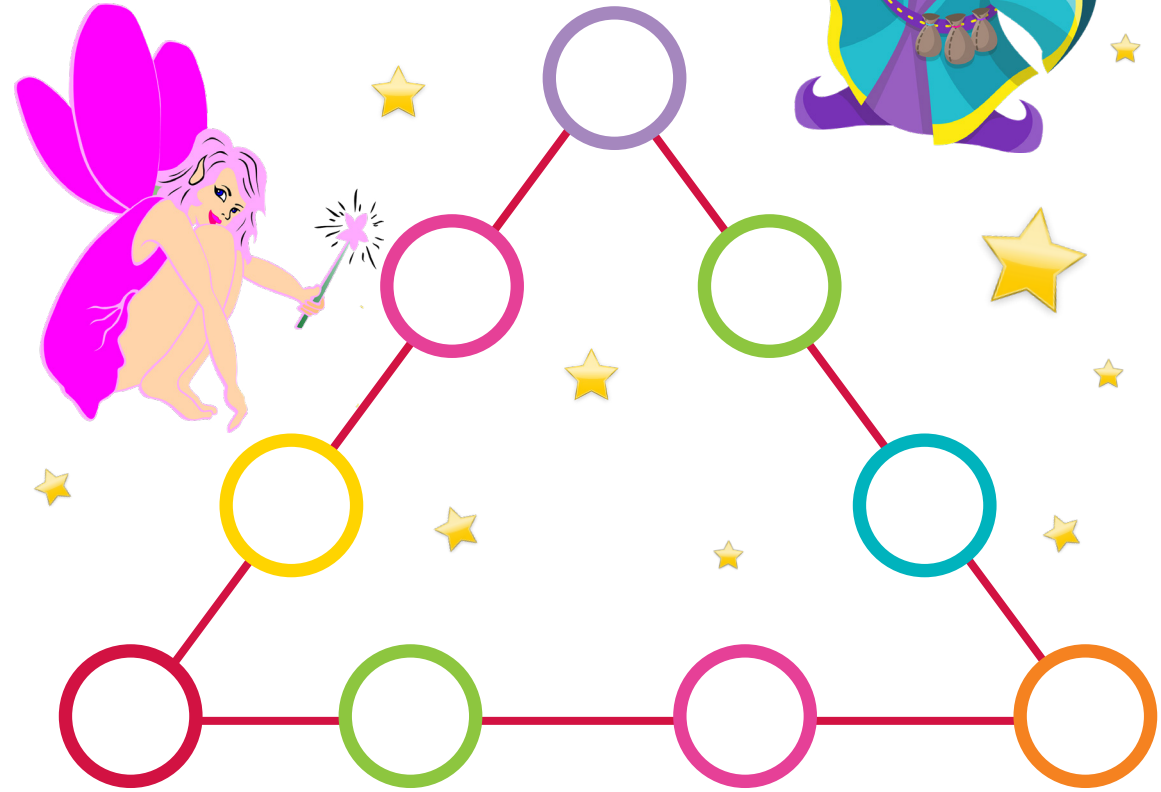
# Matching times answers

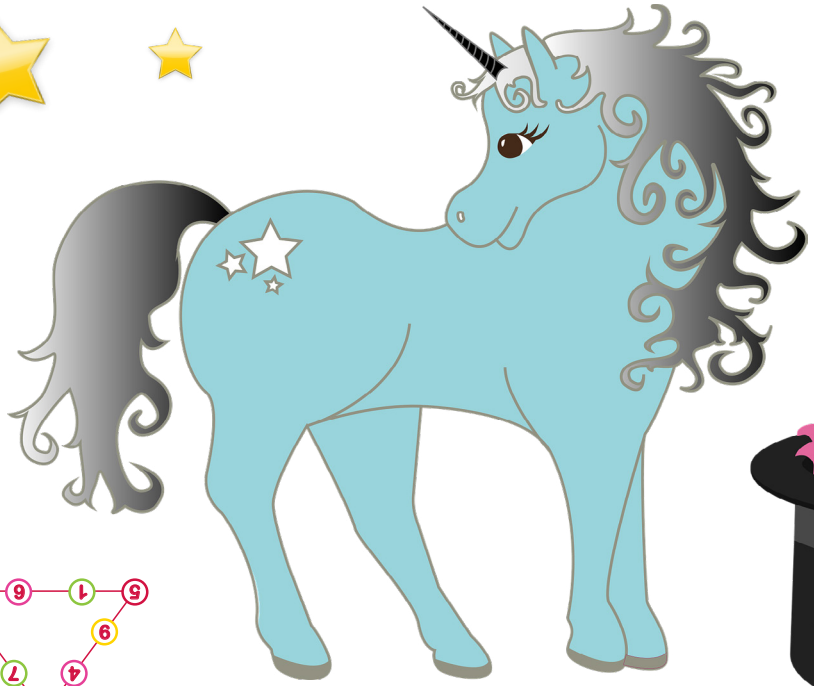


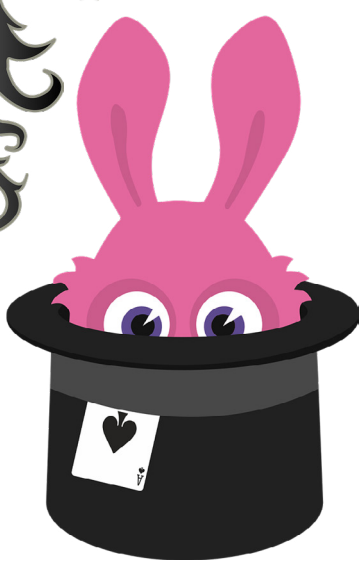
# Magic maths triangle

Can you put one of the numbers 1 to 9 inclusive in each circle so that each side of the triangle adds up to 20? You can only use each number once!









Answers:

# Number sentences: creating 20

Make the numbers from 1 to 20 by using only the digits 1 to 9 inclusive and the four operation signs. You can use addition, subtraction, multiplication and division.

Record your calculations below! Some have been done for you.

1 =

2 = 9 - 7

3 =

4 =

5 =

6 =

7 =

8 =

9 =

10 = 2 x 5

11 =

12 =

13 =

14 =

15 =

16 =

17 =

18 =

19 = 9 + 6 + 4

20 =

# Adding and subtracting money: cake sale problems

**Sunnyvale Primary school are holding a cake sale after school. Here are the cakes available for people to buy:**

1. David wants to buy three iced buns. How much will he spend?

2. Jake has £1.00. How many cupcakes can he buy? How much change will he get?

3. If Amy bought three gingerbread men and a cookie, what would she spend?

4. How much more is an iced bun than a cookie?

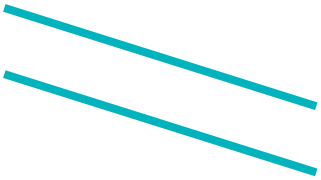
5. If Sally bought one of each item at the bake sale, how much money would she need?

**CHALLENGE** How much change would Sally get from £5.00?

**Answers:** 1. £1.20 / 2. 2 cupcakes and 30p change / 3. £1.10 / 4. 20p / 5. £1.50 / Challenge: £3.50

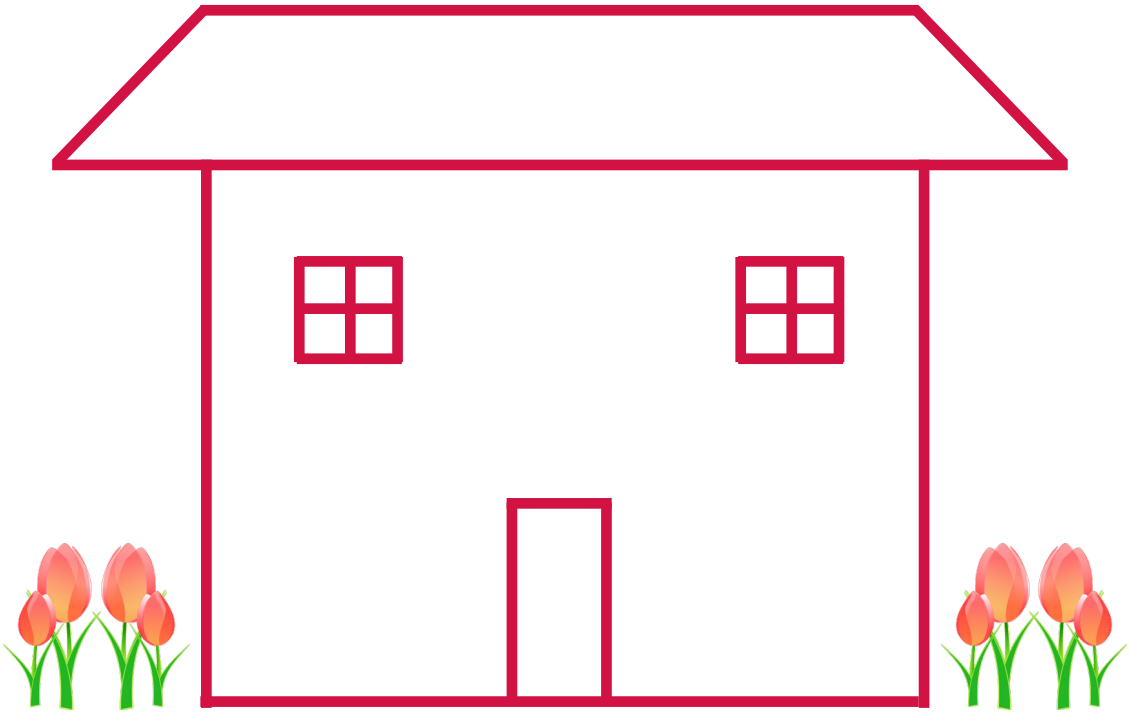
# Perpendicular, vertical, horizontal and parallel lines

Count how many of each of these lines you can find in the picture below. It may help to use different colours to highlight or mark each type of line. Remember, some lines will be more than one thing!



parallel lines

perpendicular lines



**PARENT TIP!**

In Year 3 children learn to identify different types of lines. Parallel lines run at equal distance to each other, like a train track, and perpendicular lines are at right angles to each other.

# Measuring: mm and cm

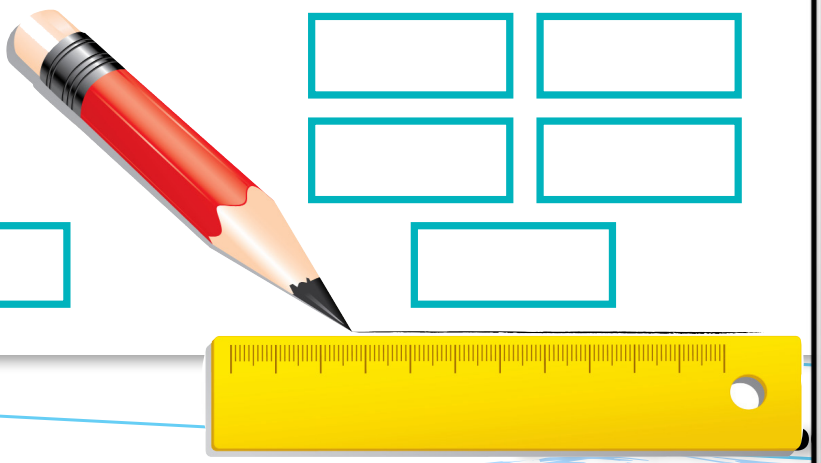
## INVESTIGATION

Find six things that are less than 30cm in length. Estimate the length of each object and then measure it and fill in the actual measurement. Record how close your estimate was. If you don't have a ruler, cut this one out to help you.

| Object | Estimate (cm) | Actual length (cm) | Difference between estimate and actual length |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

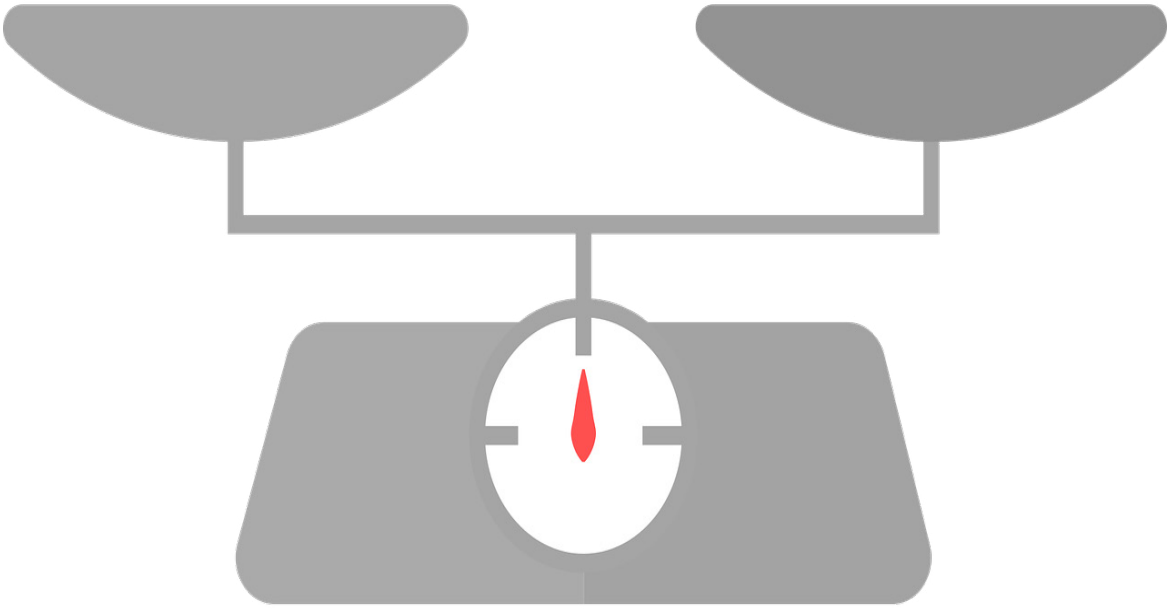
**CHALLENGE**

List as many objects as you can that are exactly one cm or less in length. Can you think of a good way of checking / estimating if you didn't have a ruler?



# Mass: converting units

Can you cut out the weights below, then put the correct weights together so they balance the scales?



**PARENT TIP!**

Children in Year 3 will be measuring weight or mass in kilograms and grams. There are 1000g in a kilogram.

**Answers:**
1kg = 1000g / ½ kg = 500g / 2kg = 2000g / 0.25kg = 250g / 0.2kg = 200g

# Find the missing shapes

**PARENT TIP!**

The Year 3 curriculum covers sequencing using numbers, letters and shapes. This is the foundation for more complex algebra work in upper Key Stage 2 (Years 5 and 6).

Look at the sequences of shapes / letters below. Two are missing from each sequence. Add them in to make it complete.

1) * ? ! ? ☐ ☐ ! ? * ? ! ?

2) A B C B A B ☐ ☐ A B C B

3) * £ ! ** £ ☐ ☐ ! *** £££ !!!

4) +/++/++ ☐ ☐ ++++/+++++

5) A B A A C A B A ☐ ☐ A B A A C

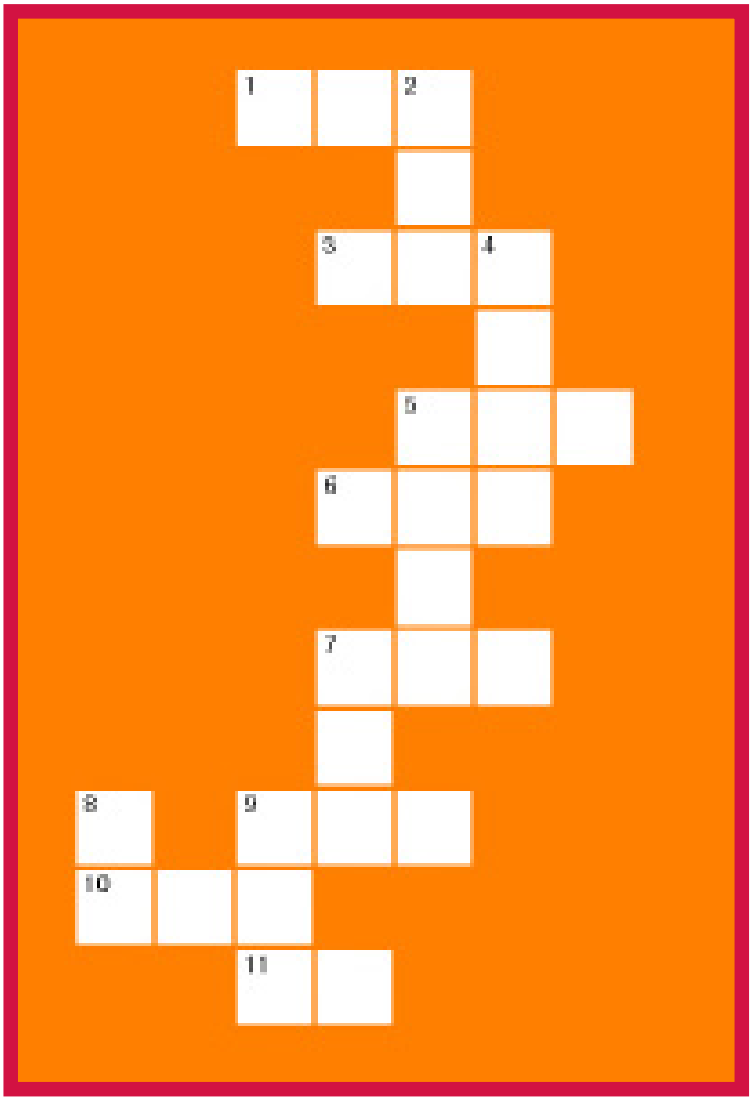
**CHALLENGE**

Make up some sequences of your own using symbols, letters or shapes.

**Answers:**

1) * ? ! ? * ? 2) A B C B A B C B A B C B 3) * £ ! ** £ ! *** £££ !!! 4) +/++/++ 5) A B A A C A B A A C A B A A C

# Column addition and subtraction crossnumber puzzle




This puzzle works in the same way as a crossword, but with digits instead of letters.

Work out the answer to each calculation by using the column method on the squared paper provided on the next page.

## ACROSS

1. 288 + 355 =
3. 84 + 78 =
5. 356 – 142 =
6. 135 +225 =
7. 56 + 44 =
9. 111 + 217 =
10. 236 + 79 =
11. 725 – 682 =

## DOWN

2. 492 – 146 =
4. 1130 + 1280 =
5. 2060 + 540 =
7. 591 - 489 =
8. 726 – 703 =
9. 580 – 226 =

**Answers:** Across 1. 288 + 355 = [643] 3. 84 + 78 = [162] 5. 356 – 142 = [214] 6. 135 +225 = [360] 7. 56 + 44 = [100] 9. 111 + 217 = [328] 10. 236 + 79 = [315] 11. 725 – 682 = [43]. Down 2. 492 – 146 = [346] 4. 1130 + 1280 = [2410] 5. 2060 + 540 = [2600] 7. 591 - 489 = [102] 8. 726 – 703 = [23] 9. 580 – 226 = [354

# Column addition and subtraction crossnumber puzzle working out paper

# Compass points mystery shape

Use a ruler to draw out a shape from the directions.

What shape have you drawn?

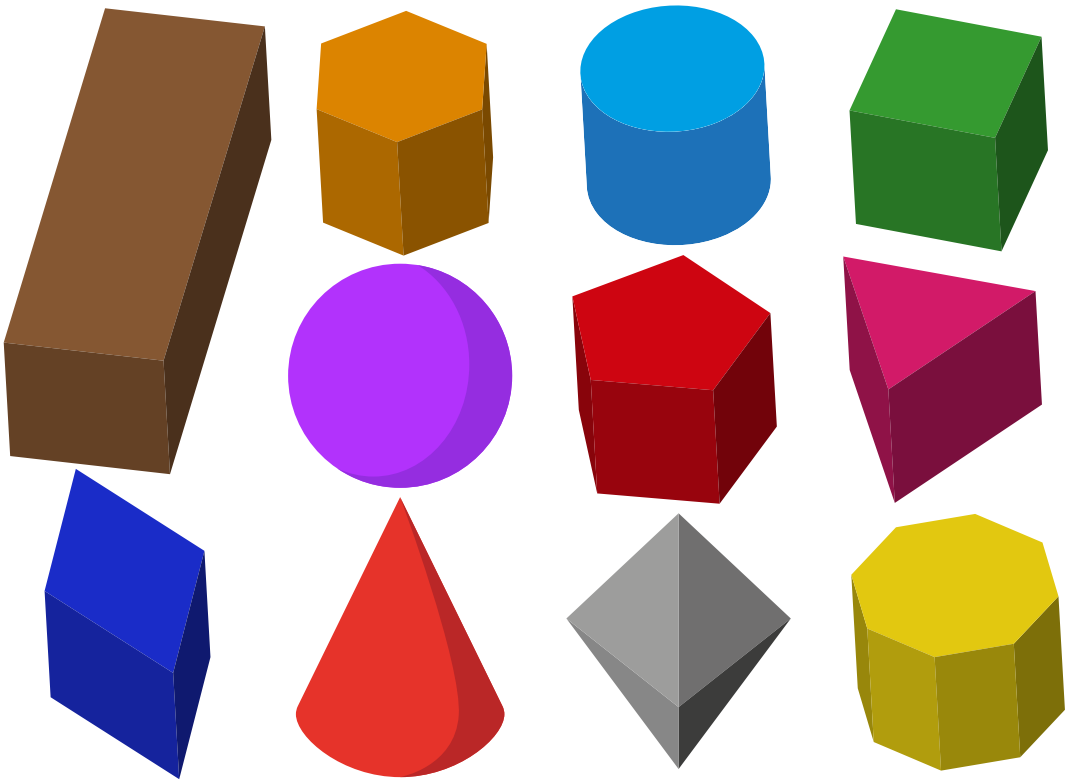
Start

1) Start
2) Move 8 squares East
3) Move 1 square North
4) Move 1 square West
5) Move 8 squares North East
6) Move 1 square East
7) Move 8 squares South East
8) Move 8 squares West
9) Move 1 square South
10) Move 8 squares East
11) Move 3 squares South West
12) Move 11 squares West
13) Move 3 squares North West

**Answers:** The shape is a boat

# What am I? Shape riddles

Solve the riddles to identify the 3D shapes.



1. I have 3 pairs of parallel faces and 8 vertices and each of my faces has 4 right angles.

2. I have 3 faces; two are parallel circles.

3. I have 5 faces and 5 vertices. One of my faces has 4 right angles.

4. I have 5 faces and 6 vertices. Two of my faces are parallel triangles.

CHALLENGE

Make up some of your own riddles for a friend to solve.

**Answers:**
1. cuboid 2. cylinder 3. square based pyramid 4. triangular based prism

# Finding fraction pairs

**PARENT TIP!**

In Year 3 children will learn to find fractions of an amount and begin to use this knowledge to calculate the value of more than one part of a whole.

The amount is divided by the denominator and then multiplied by the numerator, for example:

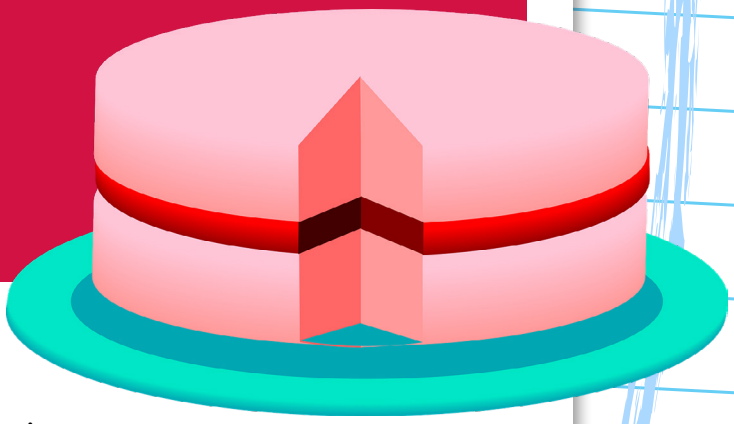
Find $\frac{2}{10}$ of 40

Step one : To find $\frac{1}{10}$ of 40 we divide 40 by 10 = 4

Step two : If $\frac{1}{10}$ is 4 then $\frac{2}{10}$ is

4 x 2 = 8

So $\frac{2}{10}$ of 40 is 8



You need two or more players for this quick-fire game.

Cut out the cards and place them face down.

Players take it in turns to turn over a card and work out the answer.

The person with the largest amount scores a point.

Record the scores and see who has the most after 10 turns.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| $\frac{1}{2}$ of 12 | $\frac{1}{4}$ of 16 | $\frac{1}{5}$ of 30 | $\frac{1}{10}$ of 20 | $\frac{1}{3}$ of 30 | $\frac{1}{2}$ of 24 | $\frac{1}{3}$ of 21 | $\frac{3}{4}$ of 12 | $\frac{1}{3}$ of 36 | $\frac{1}{4}$ of 32 |
| $\frac{3}{4}$ of 40 | $\frac{1}{10}$ of 70 | $\frac{1}{2}$ of 50 | $\frac{3}{10}$ of 30 | $\frac{1}{3}$ of 28 | $\frac{1}{4}$ of 36 | $\frac{1}{4}$ of 40 | $\frac{1}{3}$ of 18 | $\frac{1}{5}$ of 10 | $\frac{3}{10}$ of 100 |
| $\frac{1}{4}$ of 24 | $\frac{1}{10}$ of 70 | $\frac{1}{2}$ of 50 | $\frac{3}{10}$ of 30 | $\frac{1}{3}$ of 28 | $\frac{1}{4}$ of 36 | $\frac{1}{4}$ of 40 | $\frac{1}{3}$ of 18 | $\frac{1}{5}$ of 10 | $\frac{3}{10}$ of 100 |

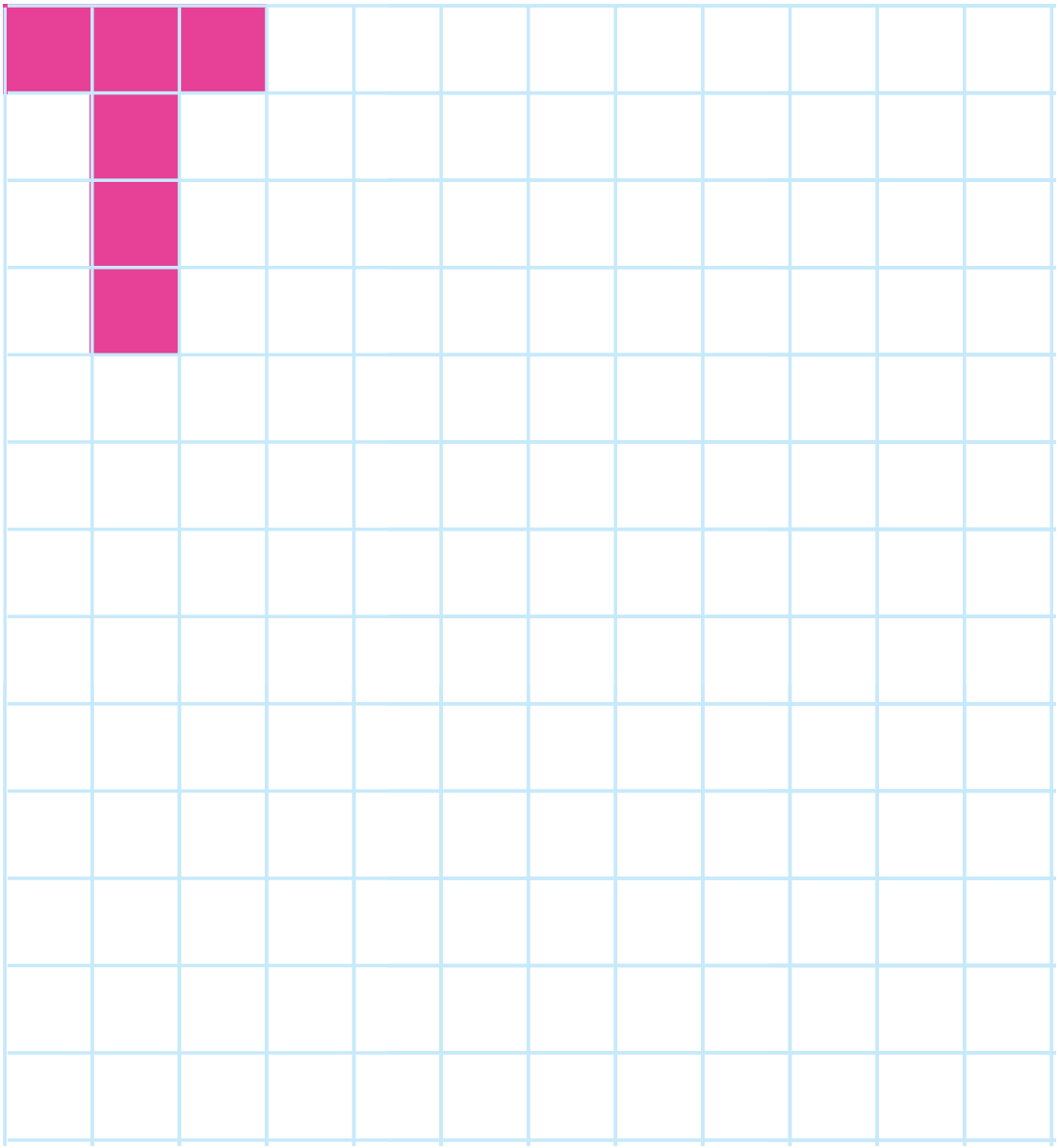
**CHALLENGE**

If you feel confident with finding these fractions, try adding some cards of your own with some trickier calculations.

# Working with nets

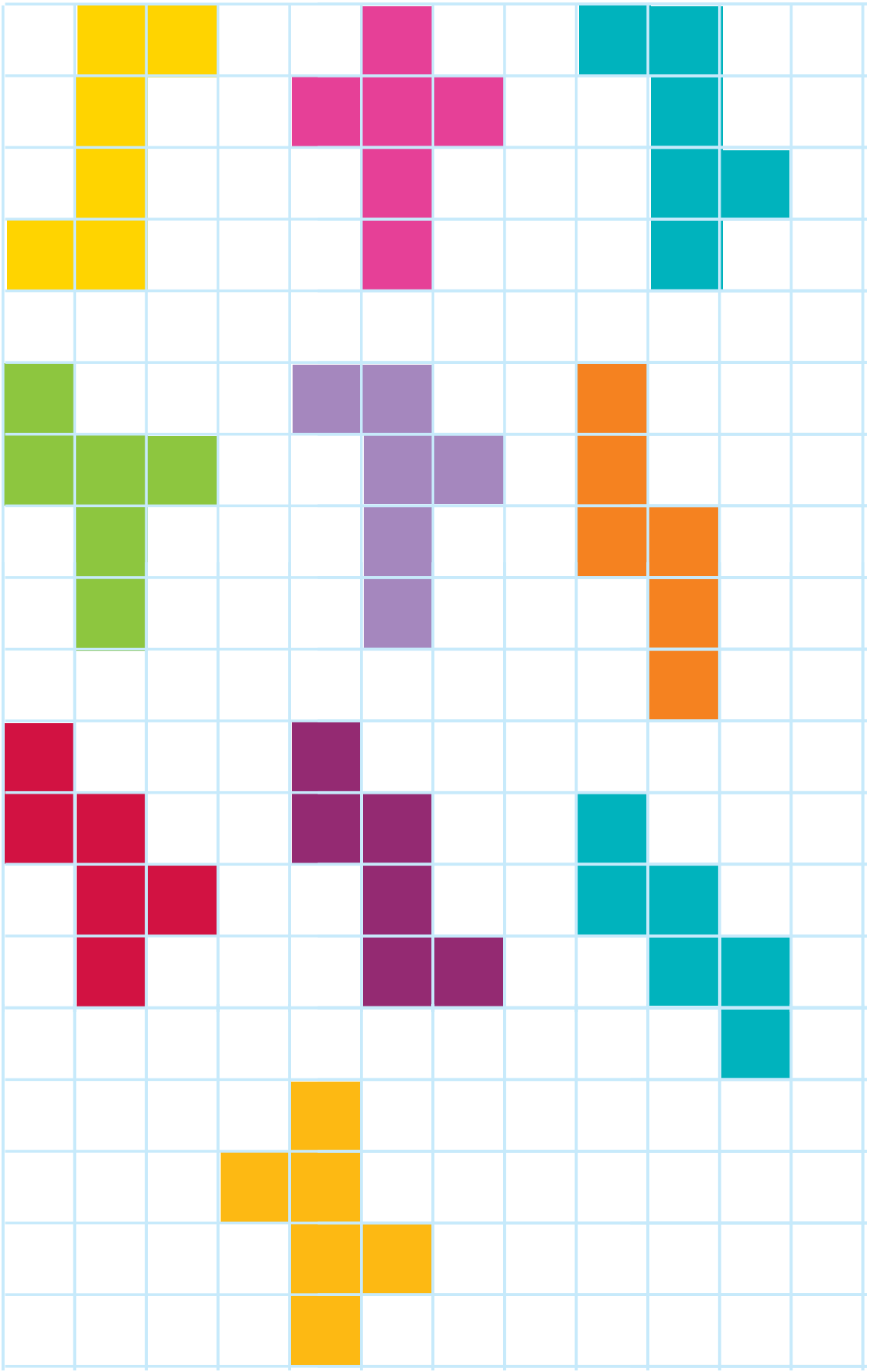
A net is what a 3D (three-dimensional) shape would look like if it were opened out flat. Below is a net for a cube. It's just one of many possible cube nets though! Your challenge is to find as many nets for a cube as you can.

Remember, the squares in each net need to be arranged so that they can be joined together to make a cube. Test out each of your net ideas by cutting out the net and making the cube.



CHALLENGE See if you can find the nets for a square-based pyramid.

**Answers:** There are 11 nets for a cube

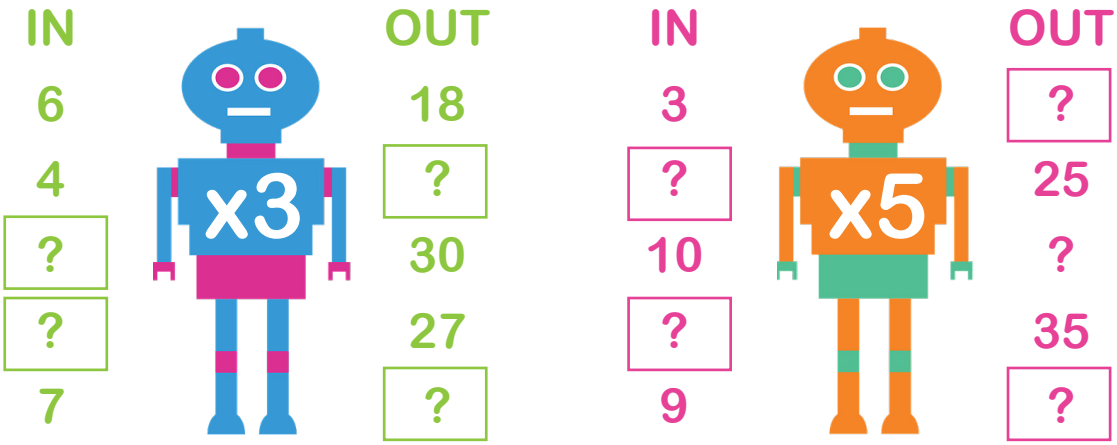


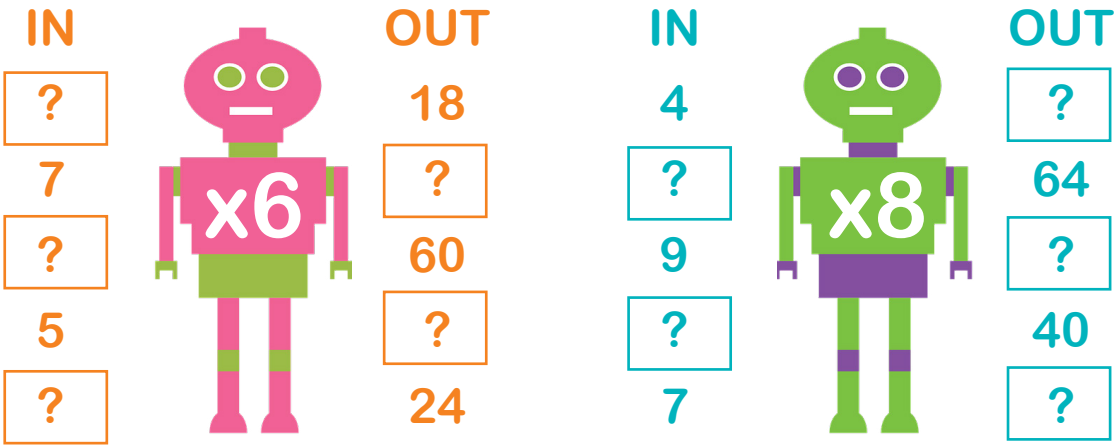
# Number machines: using times tables

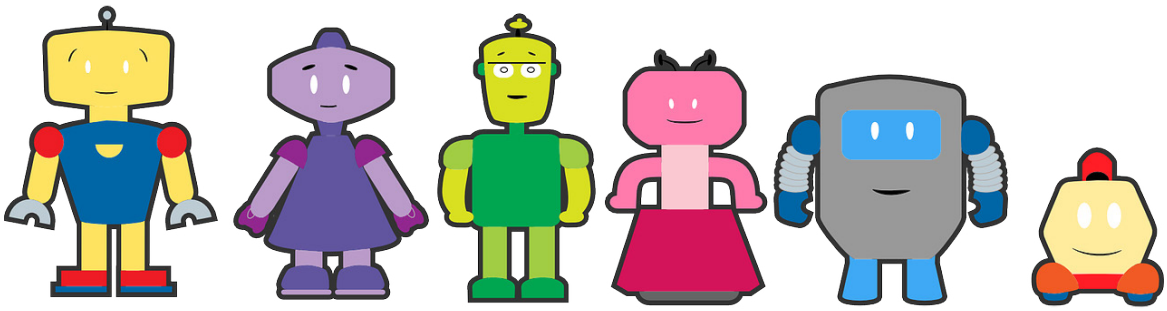
Look at these number machines. Can you work out how each one works to complete the gaps? Remember, the inverse operation of multiplication is division so you'll need to divide as well as multiply.

**PARENT TIP!**

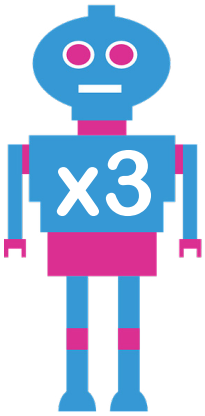
By Year 3 your child will have worked on their 2, 3, 5, 6, 8 and 10x tables. These "machines" test their knowledge of multiplication and division.



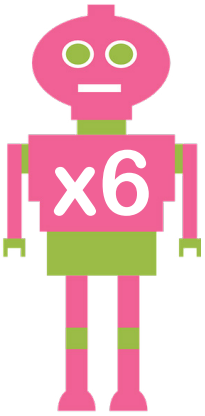



# Number machines: using times tables answers

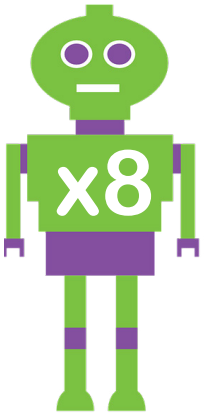



| IN | OUT |
|---|---|
| 6 | 18 |
| 4 | 12 |
| 10 | 30 |
| 9 | 27 |
| 7 | 21 |

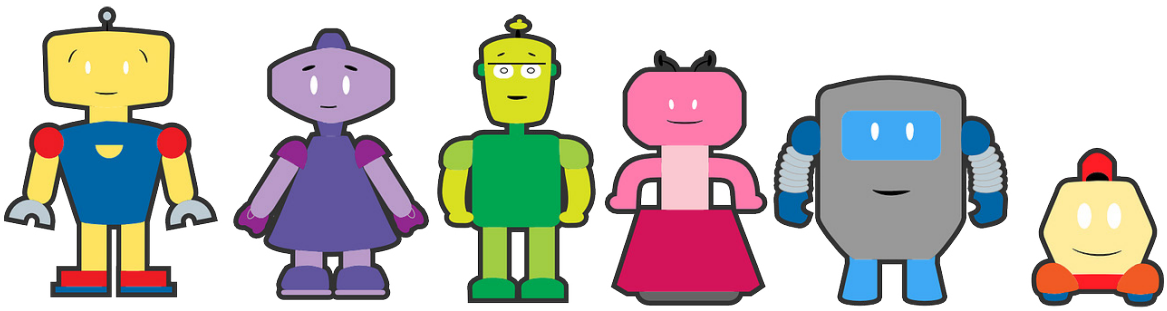
| IN | OUT |
|---|---|
| 3 | 15 |
| 5 | 25 |
| 10 | 50 |
| 7 | 35 |
| 9 | 45 |




| IN | OUT |
|---|---|
| 3 | 18 |
| 7 | 42 |
| 10 | 60 |
| 5 | 30 |
| 4 | 24 |




| IN | OUT |
|---|---|
| 4 | 32 |
| 8 | 64 |
| 9 | 72 |
| 5 | 40 |
| 7 | 56 |



# Counting coins

**Sarah has £12.75. In the boxes around the purse write 10 different combinations of the different notes and coins she could have in her purse to make up her £12.75.**

**Answers:**

Any combination of notes and coins that total £12.75 e.g. £10, £2, 50p, 20p and 5p.

# Desert island coordinates

Find what is located at each of the coordinates below.

Remember: read along the horizontal axis, then up the vertical axis.

1. ( 8,6 )
2. (13,20)
3. (13,3)
4. (2,3)
5. (17,9)

**What are the coordinates for these locations?**

1. Mighty mountains (  ,  )
2. Village (  ,  )
3. Palm tree grove (  ,  )
4. Paradise beach (  ,  )

**Add the following places to the map and write their coordinates.**

1. Buried treasure (  ,  )
2. A pirate ship (  ,  )
3. Herd of pigs (  ,  )
4. Swamp (  ,  )

**Answers:** Lagoon, crocodile creek, sheep, shark boat. Mountains (4, 15), Village (1, 18), Palm (18, 18), beach (11, 14)

# Crack the code to read the message

**PARENT TIP!**

Inverse means opposite; in Y3 children begin to use inverse operations to check their answers. Addition and subtraction are the inverse of each other (12 – 4 = 8 and 8 + 4 = 12) and multiplication and division are inverses.

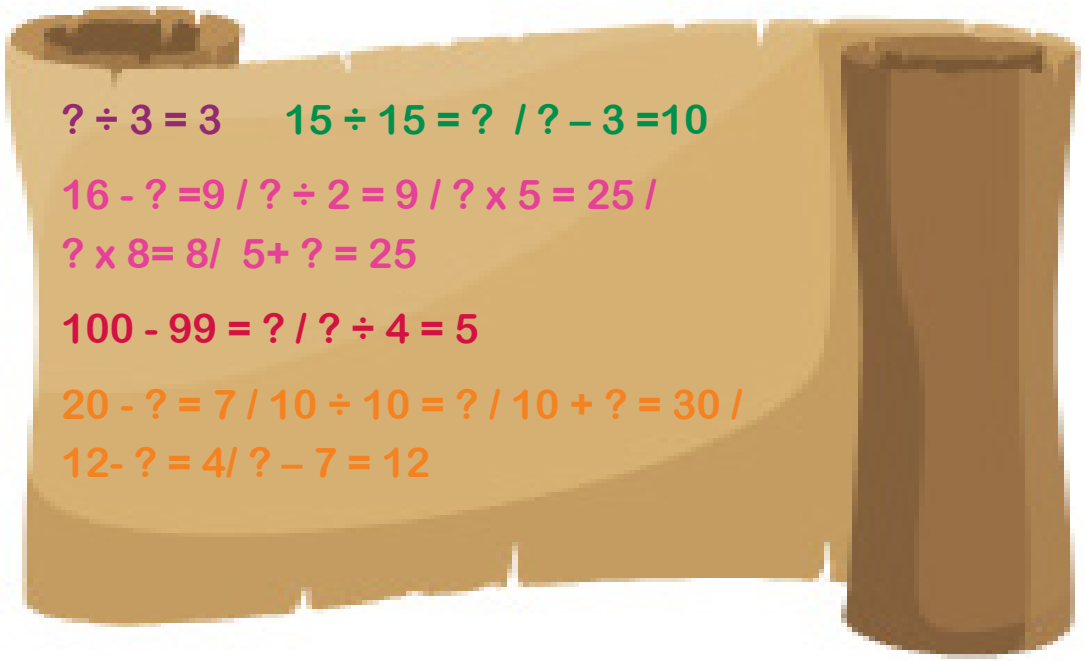
**Answers:** I am great at maths

**Each letter on the scroll below is represented by a question mark / missing number. Work out the message written in code by solving the calculations below.**

**1 is A, 2 is B, 3 is C and so on.**

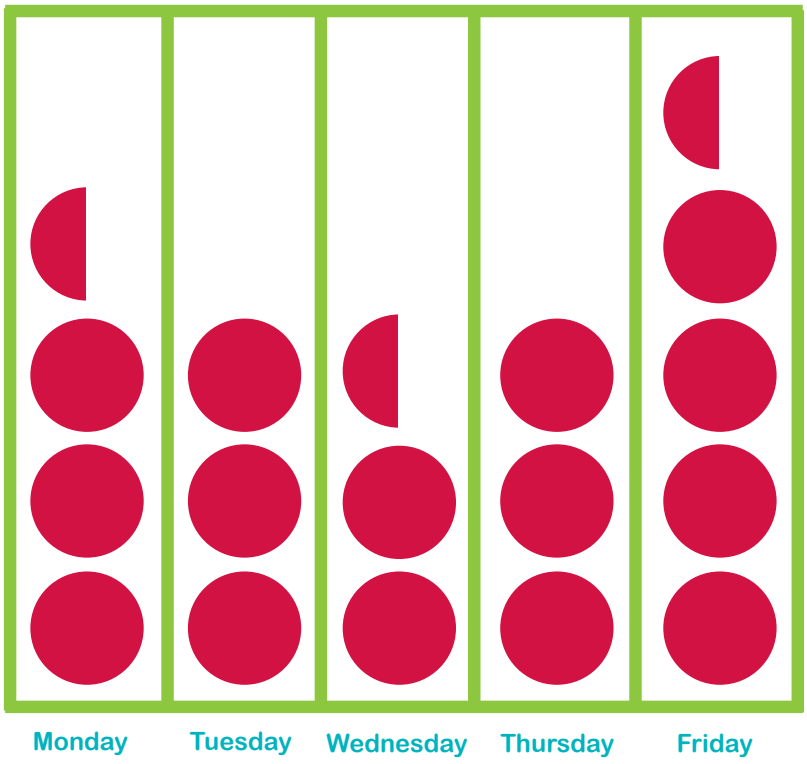
**Remember to use the inverse operation to find the missing numbers.**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 A | 2 B | 3 C | 4 D | 5 E | 6 F | 7 G | 8 H | 9 I | 10 J |
| 11 K | 12 L | 13 M | 14 N | 15 O | 16 P | 17 Q | 18 R | 19 S | 20 T |
| 21 U | 22 V | 23 W | 24 X | 25 Y | 26 Z | | | | |



# Data handling: pictograms

This pictogram shows how many children ate hot lunch each day in one week. Check the key to see what each picture represents, then use the pictogram to answer the questions.




KEY

● = 2 children

1. How many children had hot lunch on Thursday?

2. On what day did the smallest number of children have hot lunch?

3. What is the difference between the number of hot lunches eaten on Monday and Friday?

4. What was the total number of hot dinners eaten all week?

5. What is the difference between the day when the most hot lunches are eaten and the day when the least were?

6. If children don't have hot lunch they bring a packed lunch. If there are 30 children in the class, how many children had packed lunch on Wednesday?

Answers: 1. 6 / 2. Wednesday / 3. 2 / 4. 33 / 5. 4 / 6. 25

# Carroll diagram sorting

Carroll diagrams are used to sort items into sets. They are named after mathematician Lewis Carroll (the author of *Alice in Wonderland*).

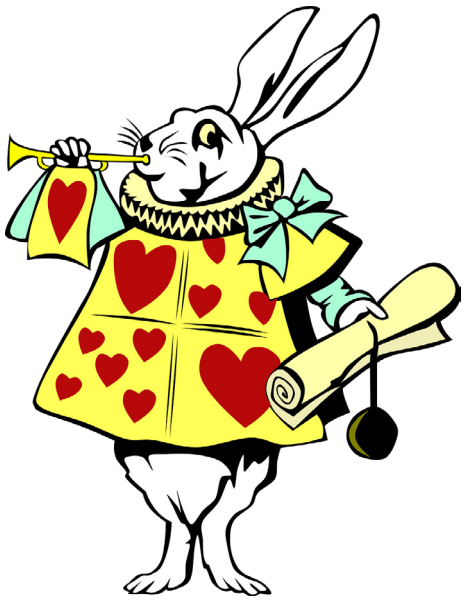
| | Even numbers | Odd numbers |
|---|---|---|
| Multiples of 8 | | |
| Not a multiple of 8 | | |

Put each number into the correct place on the Carroll diagram.

8, 15, 24, 34, 32, 80, 36, 73, 56, 35, 72, 40, 88, 48, 16, 65, 23, 78

What do your results tell you about the multiples of 8?

Can you add some of your own numbers to the diagram?



| | Even numbers | Odd numbers |
|---|---|---|
| Multiples of 8 | 8, 24, 80, 56, 72, 40, 88, 48, 16 | |
| Not a multiple of 8 | 34, 36, 78 | 15, 73, 35, 65, 23 |

**Answers:** All multiples of 8 are even numbers.

# Time and distance bingo

This bingo game helps us practise converting measures of distance and volume as well as at different measures of time. Remember:

1litre = 1000ml  1 km = 1000m  1m = 100cm

You need two players for this game. Each one takes a board. Cut out the cards and place them face down in one pile. Take it in turns to turn over the top card from the pile.

If you have the answer on your board, cross it through or cover it with a counter. The first person to cover all their answers shouts bingo and wins.

## PLAYER 1

| | | |
|---|---|---|
| 60 | 1 minute | 400ml |
| 15 | 24 | 3000 |
| 250ml | 800m | km |

## PLAYER 1

| | | |
|---|---|---|
| 3.5 | 2000 | 365 |
| cm | 12 | 120 |
| 1.5 | 7 | 48 |

| | | |
|---|---|---|
| The number of minutes in quarter of an hour | 10m in cm | What unit would you use to measure the distance from London to Manchester? |
| The number of days in a year | Convert 60 seconds into minutes | The number of metres in 3km |
| The number of metres in 2km | What unit would you use to measure the length of a book? | The number of hours in 2 days |
| The number of days in a fortnight | 1 litre minus 600 ml | 3500ml in litres is... |
| 1500m in km is... | ¼ of a litre in ml | The number of hours between noon and midnight |
| The number of seconds in a minute | Subtract 200 metres from 1km | The number of hours in a day |
| The number of cm in 1.2m is... | The number of days in a week | The number of weeks in a year |

# Calendar work

| MON | TUE | WED | THUR | FRI | SAT | SUN |
|---|---|---|---|---|---|---|
| 29 | 30 | 31 | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 1 | 2 | 3 | 4 |

1. How can you tell that the month shown on the calendar is for the month of February?

2. What day of the week is 1 February?

3. Ben plays football every Sunday. How many games will he play in February?

4. If Sam started his holiday on 13 February and stayed for a fortnight, what date would he return?

5. If James has two weeks to complete his homework, set on 23 February, when does he need to hand it in?

6. Jane's birthday party is on 17th February. She sent out her invitations three weeks before. When did she send them?

CHALLENGE What day of the week is 1 April?

**Answers:** 1. It is the only month with 28 days. 2. Thursday 3. 4 games 4. Tuesday 27 February 5. Friday 9 March 6. Saturday 27 January 1 April is a Sunday.