

Using Maths P5-P7



Contents

2=2 is still 4	03-04
Problem-Solving Strategies	05
Making a table	06-08
Carroll diagrams	09-10
Venn diagram	11
Tree diagram	12
Problem Solving Examples	13
Calculate this	14
Look for a pattern	15
Shaping up!	16
Don't make me cross!	17
Draw a picture	18
Smarty pants	19-20
Make it simpler	21
The car graph	22
REAL LIFE MATHS	23
Priceless words	24-25
A stroll in the Countryside	26
How do you measure up to these problems	27
Problems Galore	28-29
More everyday problems	30-31
Up for the match	31-35
Investigation	36
Simple report on investigation	37
Walk the line	38
On the money!	39
Big head	40
Jelly bellies	41
Examples of investigations	42
Digit investigation	43-44
How to make 100 from 9 numbers	45
Back to front numbers	46
Useful websites for KS1 and KS2	47

2+2 is still 4!!

Despite all the technological advances that have been introduced to schools and home through PCs, laptops, tablets, iPads, etc. etc., our children still need to know some basics and understand how to work things out in Maths.

Sometimes, as parents and schools, we have to be careful not to get too carried away with the “right” answer. It is very important to know why it is correct, and how we arrived at that answer.

Sitting down with your child and asking them to explain how they do their sums can be as useful as getting the correct answer.

One other very important tip is to give your child “Wait Time”. Don’t jump in right away if your child hasn’t given an immediate answer. If you do they will sit back and let you continue to do it.

Useful Tips and Questions.

On a piece of card or paper write the sum: **9+3**
and ask your child

“Do you know what the answer to that is?”

Then underneath that sum write the sum: **9+4**
and ask your child

“Do you know what the answer is?” and “Was the first sum any help?”

Repeat the steps above for

$$9+5$$

$$9+6$$

On a piece of card or paper write the sum: $6+6$

Ask your child “Do you know what the answer is?”

Underneath put the sum: $7+5$

Ask your child “Do you know the answer?” “Was the first sum any help?”

Keep repeating for $8+4$

$$9+3$$

In these examples, and others, the important issue is to try to get your child to explain HOW they did the sum or calculation, not just give the answer.

Write out random numbers suitable for your child Eg. 1-10 or 1-100 and ask them to put in the correct order but also explain WHY they put them in that order.

Write a few sums out where they are “bridging” the 10. Eg. $7+5$ and get them to use a strategy other than counting in ones. Listen to them explaining. They may say something like “I added 3 more to make 10 and then 2 more to make 12”

Eg. $15-6$ “I split the 6 up into 5 and 1. I took the 5 away from 15 to get back to 10 and then 1 away from 10 leaves 9”

It may seem easy to us adults, but it is vital to allow the children to explain how and why they did the problem, and give them time as well.



Problem-solving Strategies

The main strategies are:

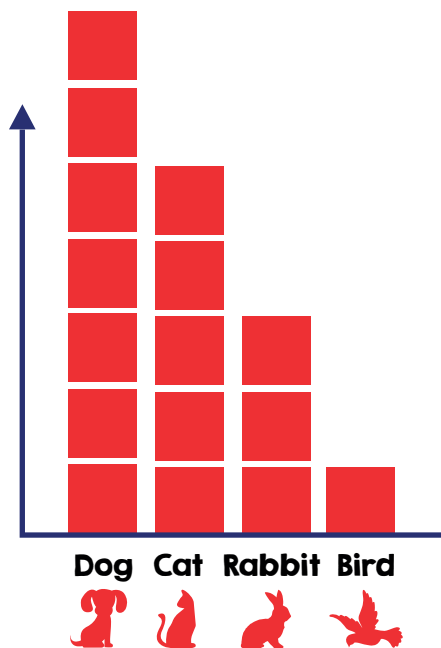
- **Look for a pattern**
- **Guess and check (trial and improvement)**
- **Make a picture or diagram**
- **Use logical reasoning**
- **Make it simpler**
- **Work backwards**
- **Make a list or table**

MAKING A TABLE











Car Count

	Red	Blue	Total
MONDAY	IIII II	IIII	12
TUESDAY	IIII	IIII IIII	13
WEDNESDAY	III	III	6
THURSDAY	IIII I	III	9
FRIDAY	IIII IIII	II	11
			51

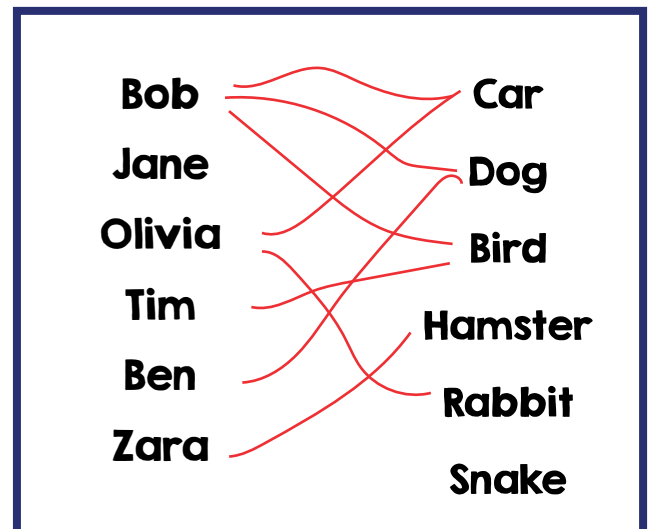
Block graph



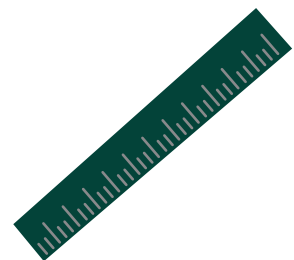
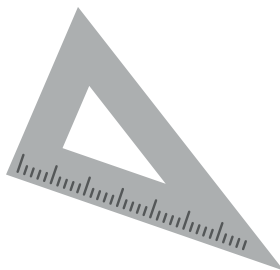
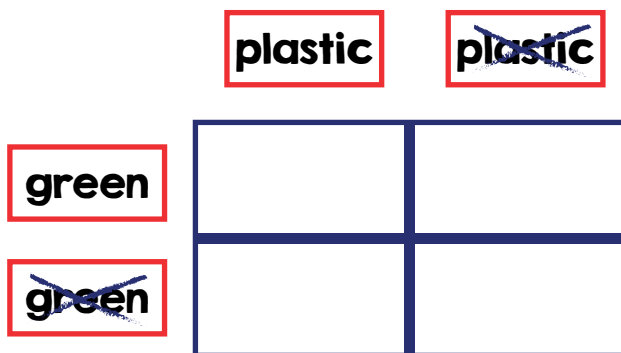
Pictogram

9 years old						
10 years old						
Number of children	1	2	3	4	5	6

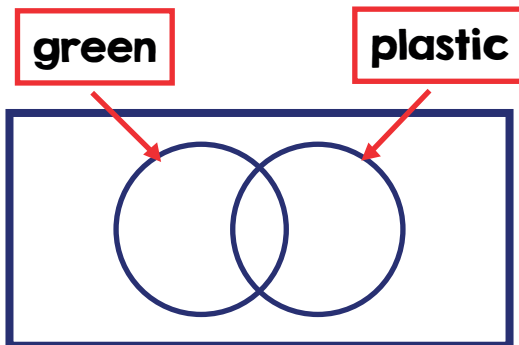
Mapping diagram



Carroll diagram



Venn diagram

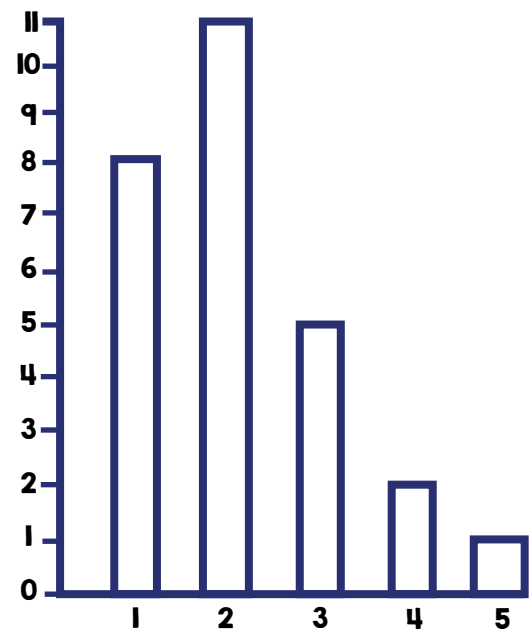


Frequency table

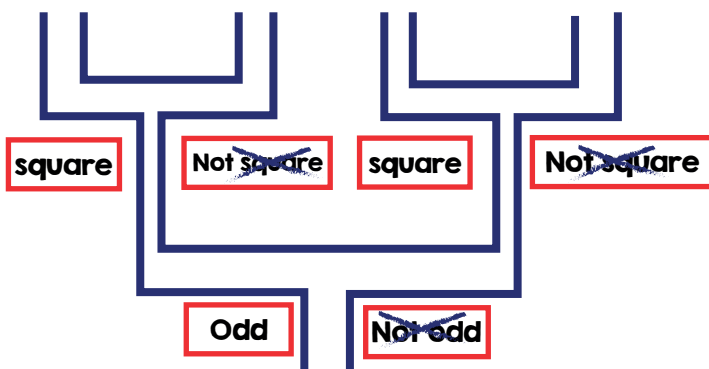
Cars

Blue	XXX	3
Red	XXXXXX	6
Yellow	X	1
Black	XXXX	4

Bar chart



Tree diagram (Classifying/Sorting)



Carroll diagrams

silver

more than 5p
(>)

~~not silver~~

£2

Not more
than 5p

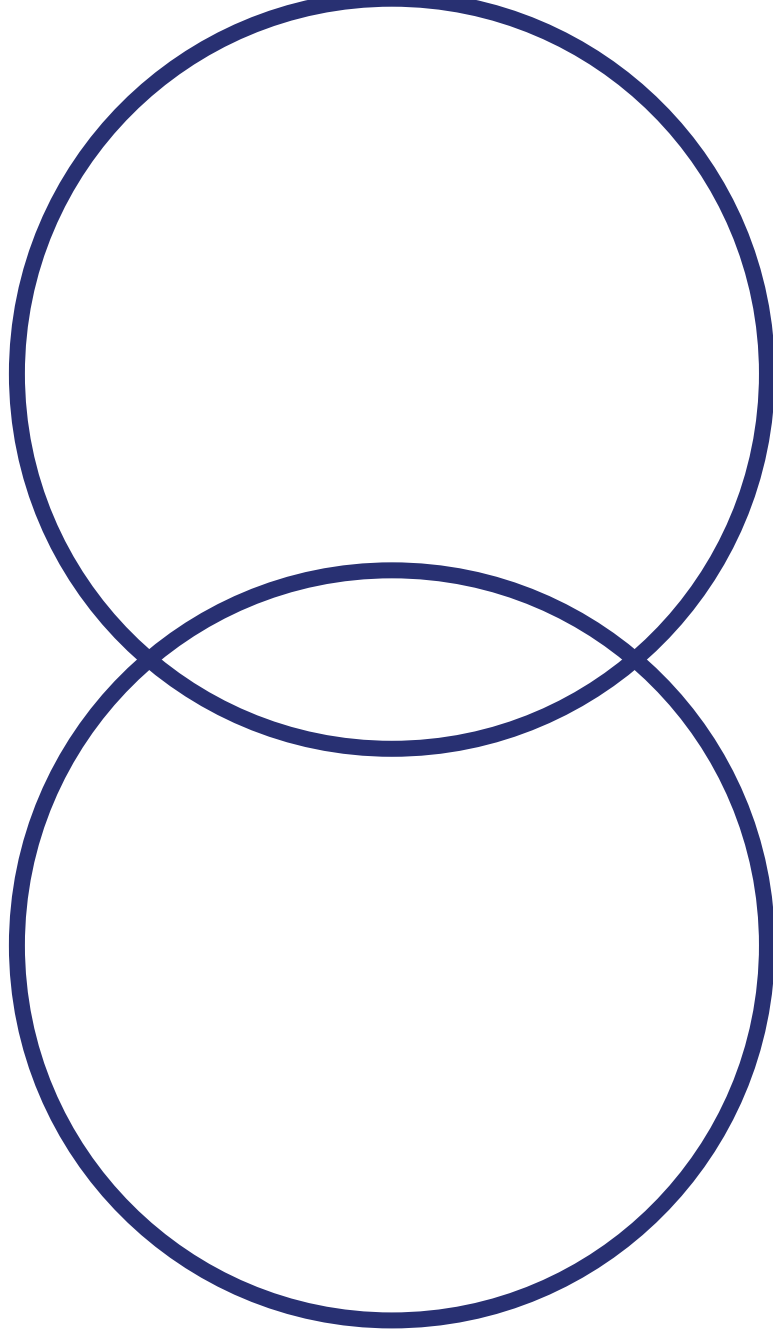
Put these coins into the correct spaces on the grid.



Venn diagram

Odd number

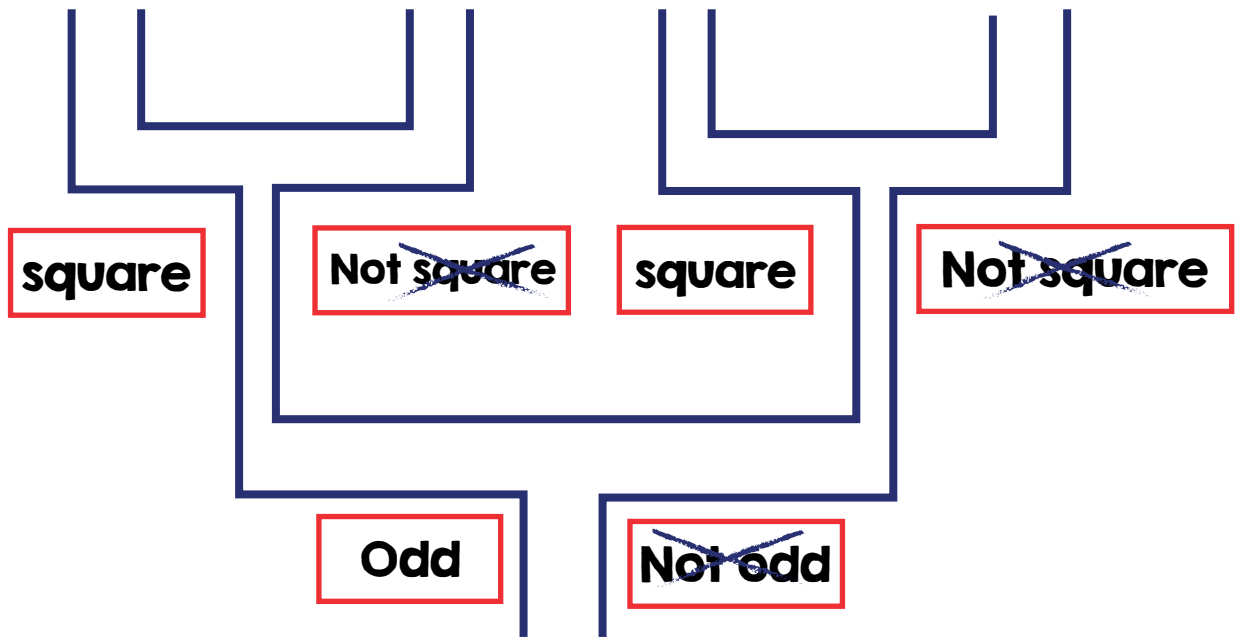
Multiples of 7



14 3 49 85 77 35 100 62 28 51

Sort the numbers into the correct place. Are there any which don't go into either/both circles? Why?

(Classifying/Sorting)



Sort the numbers into the correct branch:

92 81 16 51 36 22 25 64 49 15

Problem Solving Examples

MAKE A TABLE

Calculate this

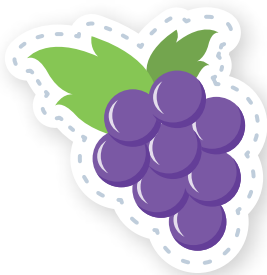
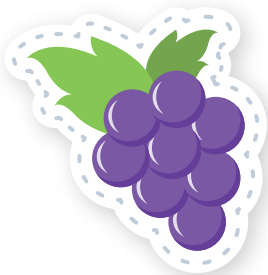
I bought a calculator and paid the exact money

I used three coins. One was a 50p coin

The calculator cost more than £2 and less than £3

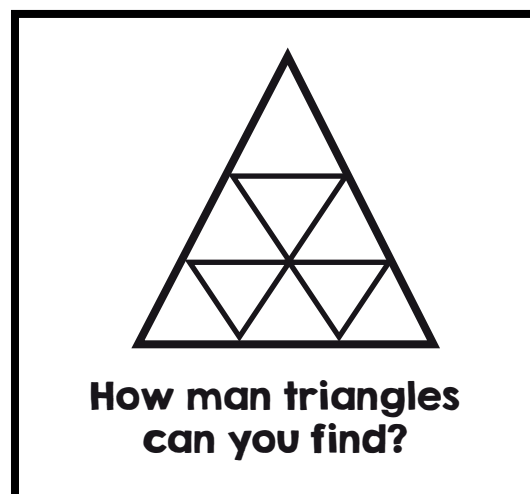
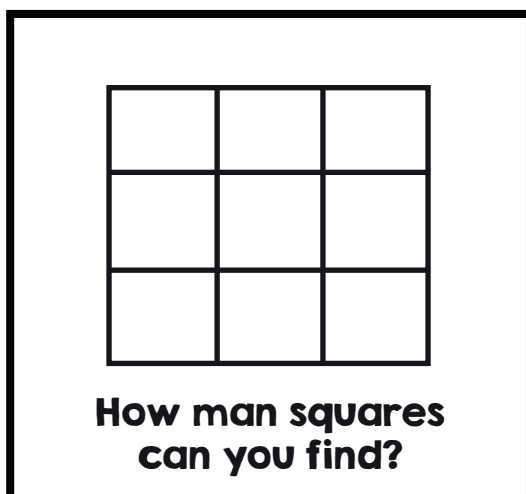
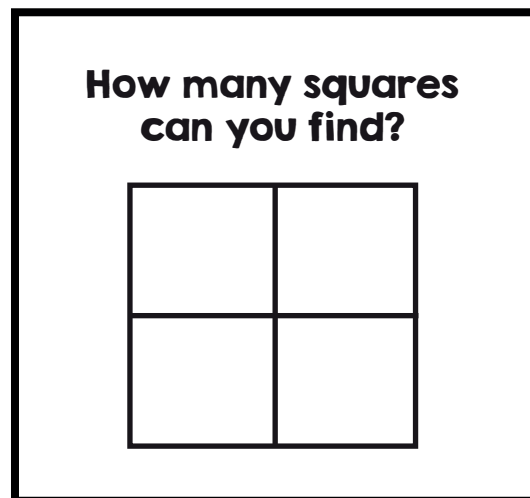
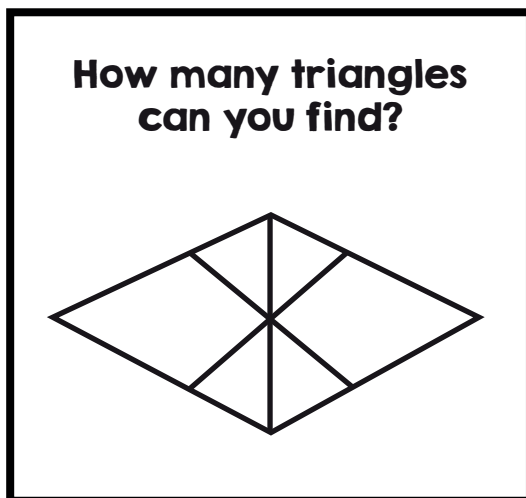
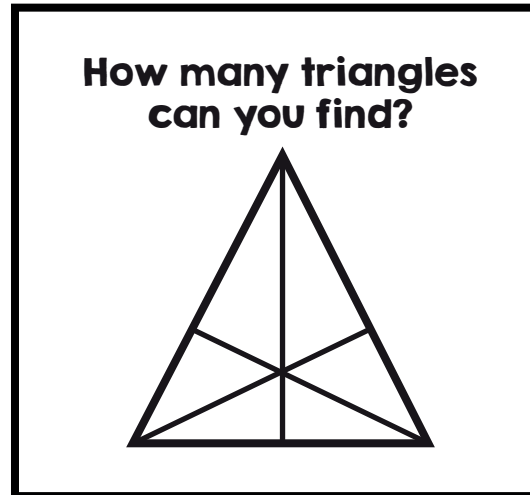
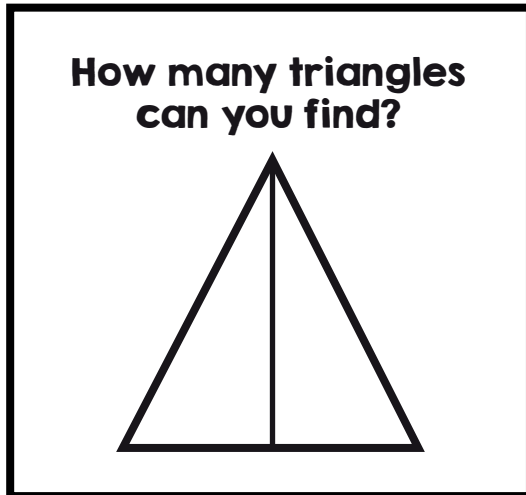
Tell me the possible amounts I could have paid for the calculator. What's the least amount I could have paid? And the most?

Look for a Pattern



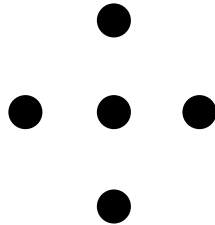
Shaping Up!

How many shapes?...

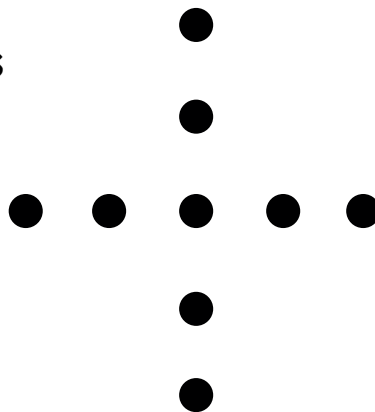


Don't make me cross!

1st Cross - 5 dots



2nd Cross - 9 dots



Build the third cross.

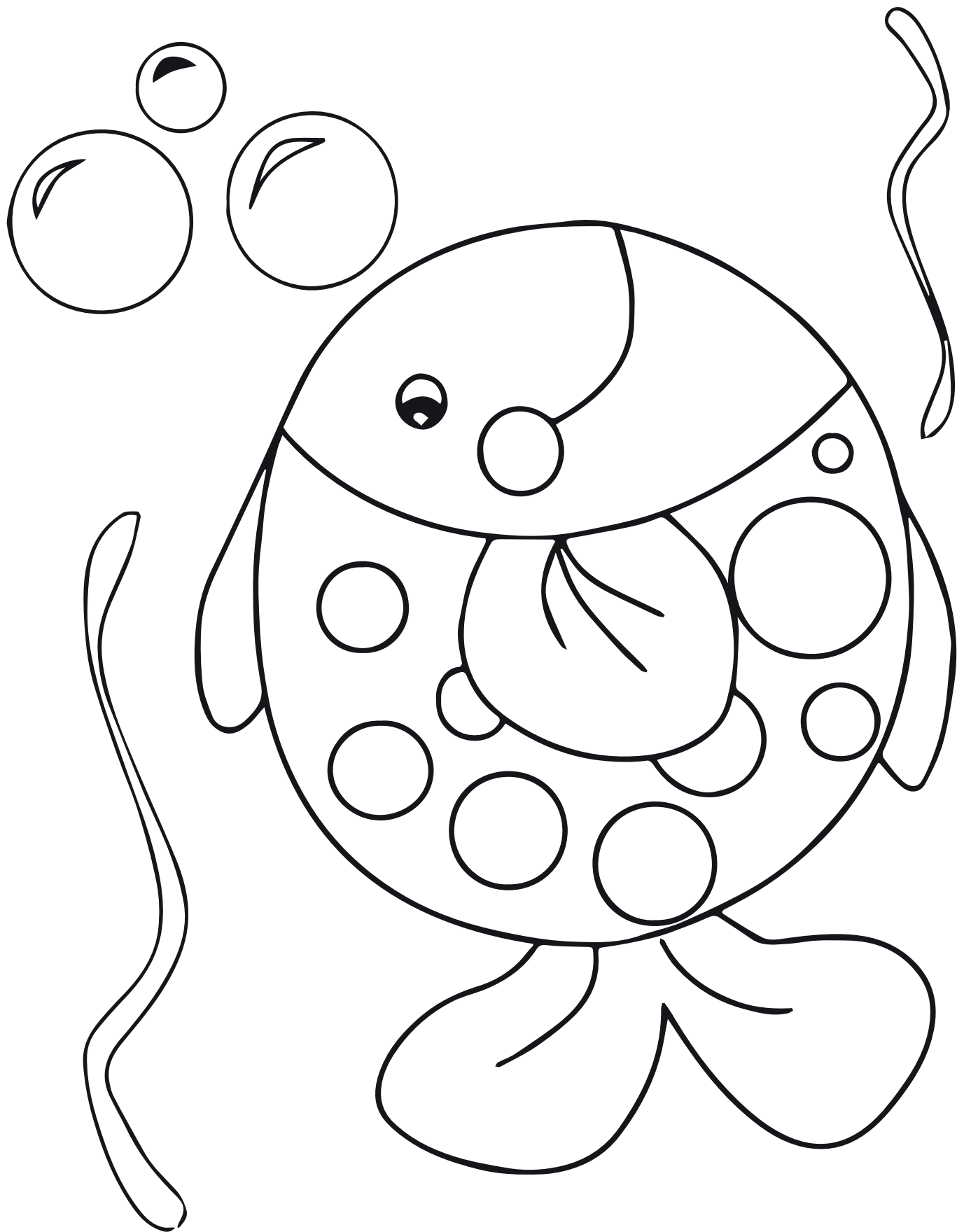
How many dots did it take?

How many dots do you think it will take to build the 4th Cross?

Build it to see if you were right.

How many dots for the 100th Cross?

Draw a picture



Smarty Pants

You have a red Smartie, a green Smartie and an Orange Smartie.

Use them to make patterns which are three sweets long, using each sweet only once.

Record your findings each time.

How many different patterns can you make?

How do you know you have made them all?

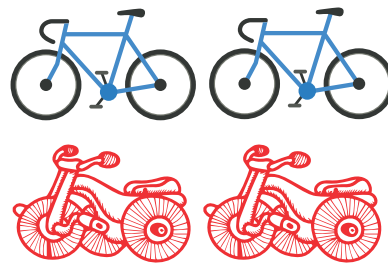
Show your results by drawing a picture (of all possible combinations)

Joe wants to take a family photograph of Amy, Brian, Charlotte and David.

In how many different ways can he arrange them?



The Bike Shop is offering a prize for the first correct answer to this question... How many bikes and trikes are in stock if there are 31 seats and 61 wheels?



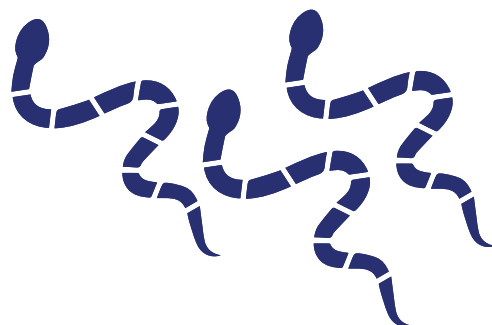
MENU

1. Salad or Soup of the Day.
2. Chicken, Beef, Pasta or Kebab.
3. Rhubarb Crumble, Custard or Strawberry Jelly.

How many different 3 course meals can be ordered?



A scared snake is at the bottom of a 10 metre well. Each hour she slides up 3 metres but slides back down 2 metres. At this rate, how long will it take her to get out of the well?



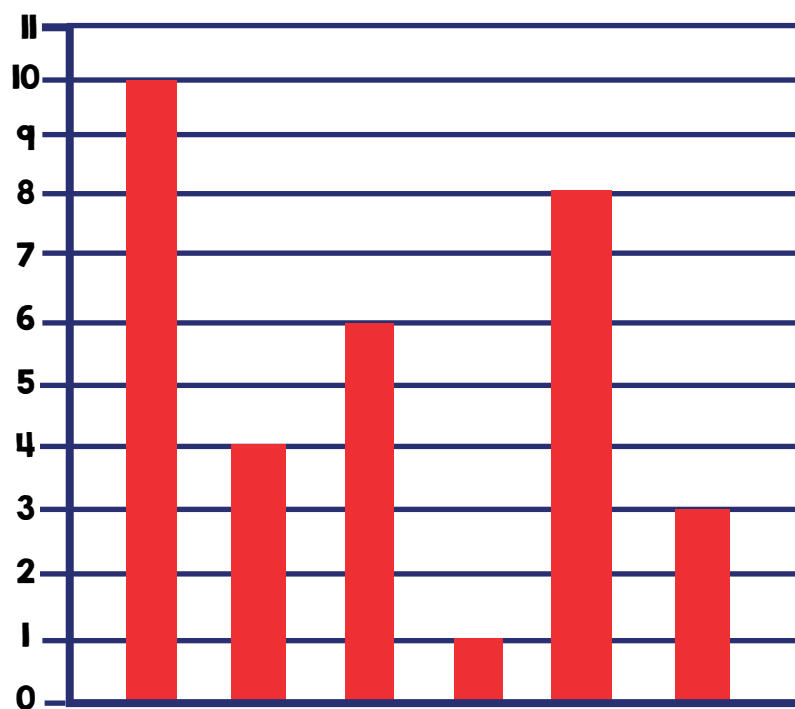
Make it simpler



The Car Graph

Aaron's class collected information about all their parents' cars. They have six different coloured cars between them.

This is the block graph they are making to show how many of each coloured car the class has between them.



The children have not yet put in the car colours under each column. Can you do this for them using the information below?

There are two less white cars than grey cars.

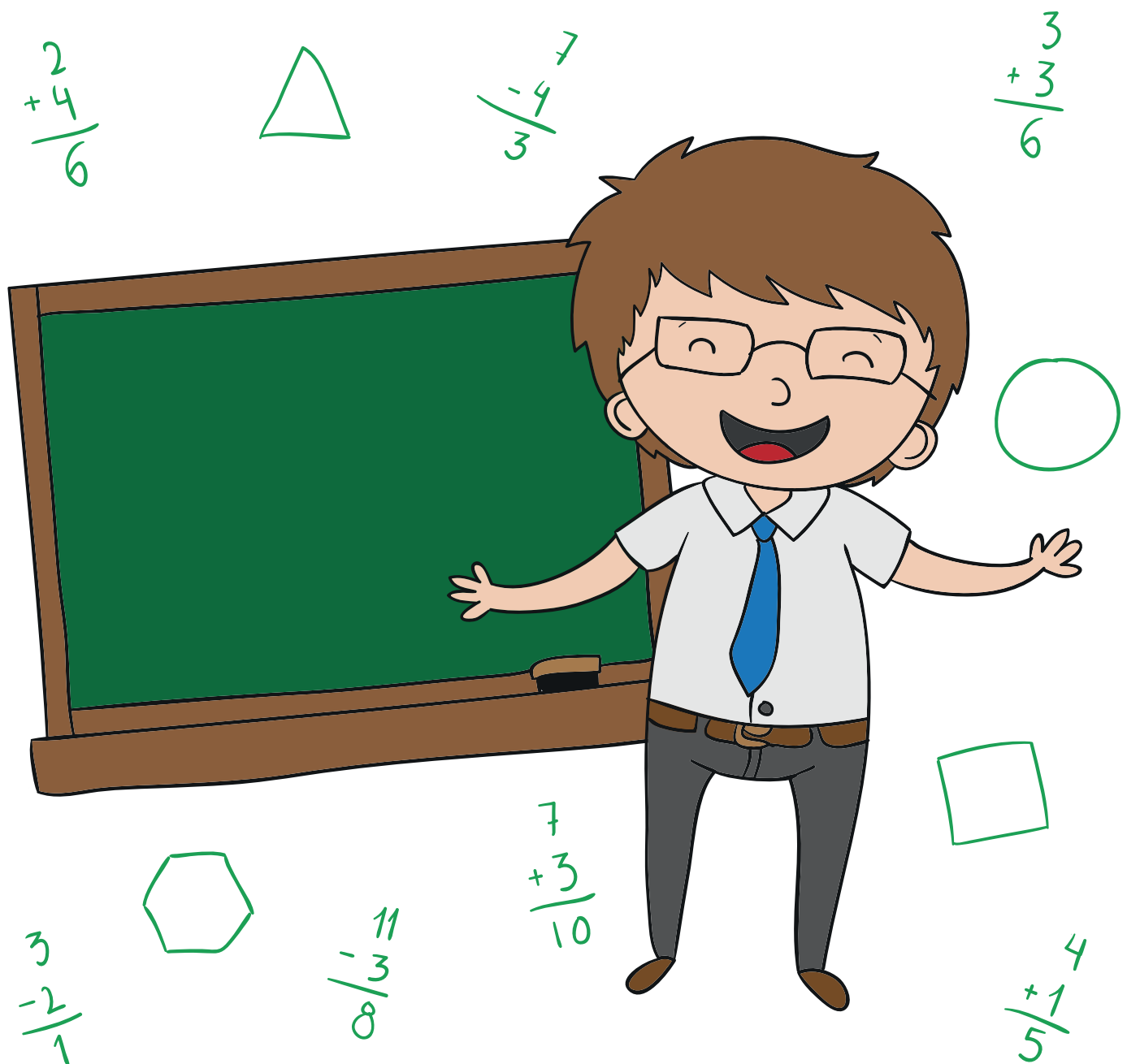
Only one child's parents have a yellow car.

The number of blue cars added to the number of black cars is equal to the number of grey cars.

There are twice as many blue cars as red cars.

There are half the number of black cars as there are white cars.

Real Life Maths



Priceless Words

Each letter of the alphabet is given a value

Can you find out the following:

How much are you worth? (use your first name only)

What are these words worth?

ZOO KING QUEEN DECADE

What is the value of the word NUMERACY?

Can you find a word worth 18p?

Can you find a word worth exactly 50p?

Who has the most valuable name in your house?

Who has the least valuable name in your house?

A	B	C	D	E	F	G	H	I	J	K	L	M
1P	2P	3P	4P	5P	6P	7P	8P	9P	10P	11P	12P	13P

N	O	P	Q	R	S	T	U	V	W	X	Y	Z
14P	15P	16P	17P	18P	19P	20P	21P	22P	23P	24P	25P	26P

A Stroll in the Countryside

**As I looked across the field, I saw farmers and cows.
Counting heads, I got 28. Counting legs, I got 88. How many
farmers and how many cows were there?**



How do you measure up to these problems?

- 1. Jill has to travel a distance of 20 miles. She travels 15 miles on a train and 3.5 miles on a bus. She walks the rest of the way. How far does she have to walk?**
- 2. I want to make 12 cakes. If I know that 6kg of flour is enough for 36 cakes, how much flour will I need?**
- 3. My car travels 30 km for every litre of fuel I put in. A litre of fuel costs £1.25. How far can I drive for £12.50?**
- 4. When a bucket is full it holds exactly $5\frac{1}{2}$ litres. A jug holds 500 mls. How many full jugs of water will I need to fill the bucket?**
- 5. Find the cost of 4.5kg of sugar at 20p per 500g.**
- 6. Luke was going to Euro-Disney. He travelled 150km by car, 50km by car, 50km by bus and 3250km by plane. How far was it from his house?**
- 7. The bus arrives at the town centre at 10.30, at the market at 12.00, the library at 14.00 and the museum at 16.05. How long does it take to get from the market to the museum?**

Problems Galore!

1. I think of a number, then subtract 17. The answer is 27.

What was my number?

2. A pizza has 8 slices. How many slices have 7 pizzas?

How many slices have 15 pizzas?

3. 6 pins are used to display a picture. How many pins are used to display 10 pictures? How many pins are used to display 19 pictures?

4. A bus seats 52 people. No standing is allowed. 17 people get off a full bus. How many were left on? How many people can sit on 6 buses? How many people can sit on 6 buses? How many buses are needed to seat 327 people?

5. I have read 134 pages of the 498 pages of my book. How many more pages must I read to reach the middle?

6. You start to read a book on Sunday. On Monday you read 10 more pages than on Sunday. You reach page 60. How many pages did you read on Monday?

Problems Galore!

7. Which amounts up to £1 cannot be paid exactly with fewer than 6 coins?

**8. A cereal bar costs 65p. How many can you buy for £2?
How much change will there be?**

9. Dawn saved 15p a week for one year. How many pounds did she save?

10. Of the 96 children in P7, $\frac{3}{4}$ have pets. 45 children have a dog. 21 children have a cat. How many P7 children have other kinds of pets?

More Everyday Problems

- 1. It takes 475 bricks to build one wall of a house. How many bricks are needed to build all four walls?**
- 2. There are 16 classes in school, each with 30 pupils in them. How many letters need to be photocopied if each person is to take one home?**
- 3. A teacher drives 10 miles to school. How far does she travel in 3 weeks of term?**
- 4. A car travels at 45 miles per hour (mph). How many miles will it travel in 8 hours?**
- 5. A school dinner costs £2.25. How much will it cost to have school dinners every day for 6 weeks?**

More Everyday Problems

- 6. The benches around school cost £60 each. How much did it cost to buy 50 benches?**
- 7. The swimming pool is 25 metres long. How many metres would I swim if I did 40 lengths?**
- 8. Judith saves £3.50 each week. How much (in £ and p) has she saved after 19 weeks?**
- 9. Jack receives £22 of pocket money per month. How much is he given each year?**
- 10. It costs £1.20 for a child to swim. How much does it cost for a class of 30 to swim?**

Up for the Match

1. Niall goes to watch Down play Tyrone at the Athletic Grounds. He sets off from home at 14.05 and gets to Athletic Grounds at 14.30. How long does it take him to get there?
2. He travels on a bus that is exactly half full. The number of passengers allowed on a full bus is 54. How many were on the bus?
3. Outside he joins the other home fans. He pays £5.50 as a junior. A senior has to pay one and a half times this to get in. How much does a senior pay?
4. He goes to the club shop. He buys a magazine (£2.25), a new scarf (£5.50) and the new away kit socks (£4.30). Can he pay with his £10 note? How much more does he need to add to his £10 to pay for his things?
5. Niall is hungry. He only has £3 left. What two items could he buy?

Hot Dog £1.75

Soup £1.60

Hamburger £1.80

Fish £1.75

Cheeseburger £1.85

Crisps £0.80

Chips £0.95

Cans £0.90

Up for the Match

6. The game lasts 70 minutes. There are three minutes added to the first half, and six minutes added to the second half. The half time break is 10 minutes long. If the game kicked off at 15.30, when will the referee blow the final whistle?

7. Niall finds himself in a long queue for the bus home. There are 123 people in front of him and 35 people behind him. How many people are waiting for the bus? There are only single-decker buses running. Each holds 35 people. How many buses will fill and move on before Niall can get on?

8. He arrives home at 19.22. How long has he been out of the house?

Up for the Match

1. Adam goes to watch Ulster play Glasgow at Ravenhill. He sets off from home at 14.05 and gets to Ravenhill at 14.30. How long does it take him to get there?
2. He travels on a bus that is exactly half full. The number of passengers allowed on a full bus is 54. How many were on the bus?
3. Outside he joins the other home fans. He pays £5.50 as a junior. A senior has to pay one and a half times this to get in. How much does a senior pay?
4. He goes to the club shop. He buys a magazine (£2.25), a new scarf (£5.50) and the new away kit socks (£4.30). Can he pay with his £10 note? How much more does he need to add to his £10 to pay for his things?
5. Adam is hungry. He only has £3 left. What two items could he buy?

Hot Dog £1.75

Soup £1.60

Hamburger £1.80

Fish £1.75

Cheeseburger £1.85

Crisps £0.80

Chips £0.95

Cans £0.90

Up for the Match

6. The game lasts 80 minutes. There are three minutes added to the first half, and six minutes added to the second half. The half time break is 10 minutes long. If the game kicked off at 15.30, when will the referee blow the final whistle?

7. Adam finds himself in a long queue for the bus home. There are 123 people in front of him and 35 people behind him. How many people are waiting for the bus? There are only single-decker buses running. Each holds 35 people. How many buses will fill and move on before Adam can get on?

8. He arrives home at 19.22. How long has he been out of the house?

Investigation



Simple Report on Investigation

What were we asked to do?	
Ideas for getting started	
Useful hints	
Ideas my child came up with	
How we did it	
Follow up	

Walk the line

Could you walk from here to Belfast in a day?

How do I find out the answer?

Do I need to walk?



Possible hints

Google the mileage

Change miles to kms

How long does it take your child to walk 10m? 100m? 1,000m (1 km), etc?

On The Money!

If you had a pile of £1 coins, one on top of another, as tall as you are, ow much money would you have?

What if you did it with £2 coins?

What if you did it with 50p coins?

Big Head

Is it true that a person's height is about three times the circumference of their head?



Do I need a tape measure? Yes/No

What if I haven't got one, can I still work out the problem?

*** Don't give your child the answer straight away.
Let him/her figure out ways for themselves**

Jelly Bellies

Do you get equal amounts of each colour in a pack of Jelly Babies?

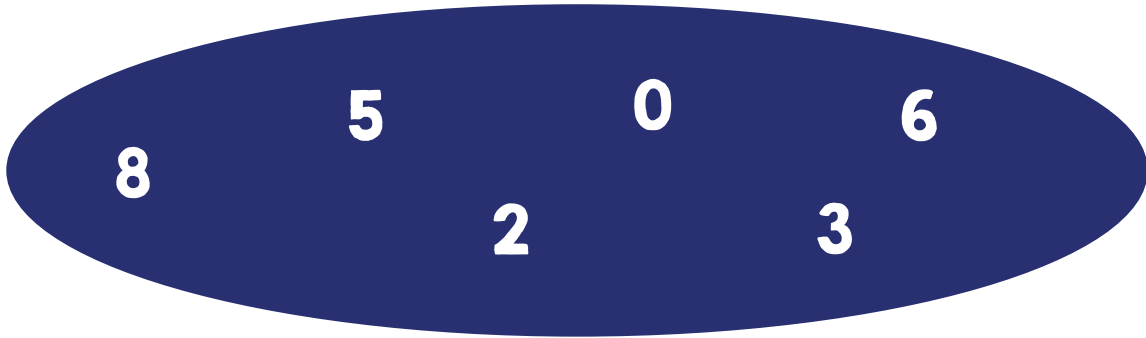
What would you expect to find about 10 packs?

What about 100 packs?

Examples of Investigations

- Is there an easy way to find $12\frac{1}{2}\%$?
- Find a quick way to get 15% of any quantity.
- Can you make all the numbers from 1 to 20 using only the number 4?
- Which breakfast cereal is the best value for money?
- How many grains of rice in a packet?
- If you sold wristbands in your school, what 3 types would sell best?
- If you counted out loud for 24 hours, what number would you get to?
- Can you find a quick way to add up all the numbers from 1 to 100? (A hundred square might help you)
- How many litres of tea or coffee does your teacher drink in a year?

Digit investigation



1. What's the biggest three digit number you can make?
2. Choose two numbers that make 11.
3. Using each of the digits as many times as you'd like, how many ways can you make 18?
4. Select three numbers that make 15.
5. What's the smallest three digit number you can make?
6. What is the total of all the digits?
7. Add two digits to make 8.
8. Put all the digits in order.
9. Using each of the digits as many times as you'd like, how many ways can you make 12?

Digit investigation

Record your investigations.

1.

2.

3.

4.

5.

6.

7.

8.

9.

How to make 100 from 9 numbers

How could you use the numbers 1 - 9 to total 100?

Each number can only be used once. You can add the numbers together and/or multiply them.

Back to Front Numbers

Back to front, or palindromic, numbers have digits that read the same backwards and forwards.

e.g. 121

or

2334332

Take any two-digit number e.g. 47

Reverse the number 74

Add the two numbers together $47 + 74 = 121$

INVESTIGATE what happens for all two-digit numbers

e.g.

$\begin{array}{r} + 24 \\ 42 \\ \hline 66 \end{array}$	$\begin{array}{r} + 35 \\ 53 \\ \hline 88 \end{array}$	$\begin{array}{r} + 143 \\ 341 \\ \hline 484 \end{array}$	$\begin{array}{r} + 4132 \\ 2314 \\ \hline 6446 \end{array}$
--	--	---	--

Try some three-digit numbers

Investigate: How many steps does each number take to become palindromic?

Useful websites for KS1 and KS2

www.topmarksmaths.co.uk

Go to Whiteboard Resources- KS1 or KS2 Problem Solving - Cuddly Toy Sale. This is an excellent site for real life money/shopping problems.

There are two main activities, a one stage problem and a two stage problem.

Well worth a visit. Go to Whiteboard Resources - KS2 Problem Solving - A Bit Fishy. A nice challenge for children encouraging the use of seeing patterns, making a table and logical reasoning. Thought provoking! Under the other headings there are so many problems and thinking skills

to explore that involve parent / child interaction. Eg KS2 - Data Handling - Bar Charts, Carroll Diagrams.

www.primaryresources.co.uk

Go to Maths - Solving Problems- Word and Real Life Problems. Loads of resources for all ages here for your child to try out with you.

www.nrichmaths.org

Search for KS1 or KS2 Problems on the Student pages and there are loads of excellent examples to choose from. Work through some of these with your child.

www.crickweb.co.uk

Search for KS2 Numeracy. There are 7 sub sections (Shape/Weight, Tools, Calculations, Money & Mean, Properties & Ordering, Times Tables, Division) all very good and some great activities underneath.

Eg Interpreting data etc. Worth exploring.

www.woodlands-junior.kent.sch.uk/maths

Great KS2 site with lots of exciting challenges for your children.

Maths Investigations section is good fun to go “head to head” in Who wants to be a Mathionaire? Or Countdown . Other sections on Measure Skills, Data and Probability, Shape and Space Skills, Number Skills all very worthwhile also. These are some useful websites.

Other useful materials, activities and games can be found on www.clounagh.org and Developing Number Knowledge (Sage publications).