



$$\square + \bigcirc = 10 \quad \bigcirc =$$

$$\triangle + \triangle = 6 \quad \triangle =$$

$$\triangle + \bigcirc = 5 \quad \square =$$

Maths Magic

What is 'Maths Magic'?

Welcome to the first issue of 'Maths Magic'.

The aim of this termly newsletter is to provide information on all aspects of mathematics your child is taught in school.

- How is multiplication taught?
- What is place value?
- How do we set out written methods of addition?
- When will my child be expected to work with decimal numbers?
- What are the progressive steps for subtraction?

The list of questions is

endless and hopefully this newsletter will come some way to answering some of your queries.

If there is anything you would like to be included in a later issue of 'Maths Magic' please let me know.

As well as having information about maths, the newsletter will include puzzles, problems and games for you to try.

A candle and holder cost £5. The holder costs £4 more than the candle. What is the price of each?



'Can you use only 4 lines to cut a pizza into 11 pieces?'



Using Dice

Investigate how many different ways there are of throwing two dice so that the total is even, and how many ways there are so that the total is odd.

Throw a die twice and make a two digit number.

Write the number that goes with it to make 100 (complements of 100). Repeat several times. How many possible pairs can you find? What would happen if you had a 10-sided die?

Investigate how many ways there are of obtaining a difference of three between two dice. What about a difference of 5?

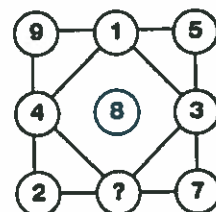
Weaverthorpe CE (VC) Primary School

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Miss J Wilkinson
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Perfect Numbers

- The first four perfect numbers are
6 28 496 812
- A perfect number is one where the divisors add up to the number.
- 1, 2 and 3 are the divisors for 6.
- $1+2+3=6$
- 1, 2, 4, 7 and 14 are the divisors for 28
- $1+2+4+7+14=28$
- All perfect numbers are even.
- All perfect numbers end with the digit 6 or 8
- Why are these numbers NOT perfect?
16 26 58 168

Which number replaces the question mark?



What is partitioning?

Partitioning is a way of working out maths problems that involve large numbers by splitting them into smaller units so they're easier to work with. So, instead of adding numbers in a column, like this...

$$\begin{array}{r} 79 \\ +34 \\ \hline \end{array}$$

113... younger students will first be taught to separate each of these numbers into units, like this... $70 + 9 + 30 + 4$...and they can add these smaller parts together. For instance, they can pick out all the tens and work down to single units, making the problem more and more manageable, like this... $70 + 30 + 9 + 4 = 100 + 13 = 113$



Why are children taught partitioning?

Children are taught this method before they learn to add numbers in columns. Partitioning gives children a different way of visualising maths problems, and helps them work out large sums in their head. By breaking numbers down into units that are easy for them (and us!) to calculate mentally, they can reach the correct answer without counting out tricky double or triple-digit numbers on their fingers or trying to remember where a decimal point needs to be.

Partitioning method

$$500 + 100 = 600$$

$$60 + 90 = 150$$

$$7 + 9 = 16$$

$$600 + 150 + 16 = 766$$

815 x 34 We partition 815 into 800 and 10 and 5 and put it in a table.
We partition 34 into 30 and 4 and put it in the table.

x	800	10	5
30	24000	300	150
4	3200	40	20

Multiply the numbers in the grid one by one, then add all the numbers to make 27,710.

Carl Friedrich Gauss

When he was 7 years old Carl Friedrich Gauss was presented with the following problem:

'Add up all the numbers from 1 to 100.'

His friends started work by

$$1 + 2 + 3 + 4 + 5 + 6 \dots$$

Gauss saw a short cut. He wrote the numbers like this:

$$1 \quad 2 \quad 3 \quad 4 \quad 5 \dots 100$$

Then he wrote the numbers from 100 to 1 underneath:

$$1 \quad 2 \quad 3 \quad 4 \quad 5 \dots 100$$

$$100 \quad 99 \quad 98 \quad 97 \quad 96 \dots 1$$

He saw that each pair of numbers added up to 101. He knew there were 100 pairs in the line, so he multiplied 101×100 .

This gave him the total of the numbers in both lines. To find the total in one line he divided by two. What was his answer?

Try Gauss' method to find the total of all the numbers to 20.



Everyday Measuring

Measuring is a mathematical activity which we all do everyday, often without thinking. Most of the time an estimate will do, but there are times when greater accuracy is needed. Reflect on some everyday things to do with measuring we might say or think:

- * We need to leave for school by 8:30am. Perhaps there is just enough time to wash up.
- * Will this bottle be big enough to hold a litre of water?

I need 250g of sugar for a cake.

- * Is there about enough in this packet?

The most common ways we use measurement and that primary children learn about are:

- length
- capacity
- mass
- temperature
- time
- angle
- area and perimeter



Many people get confused between volume and capacity—the proper definition is that volume is the space an object takes up, while capacity is the space inside it. Actually, for young children, they are pretty well interchangeable. The same is true for mass and weight, though the scientists wouldn't like you to think like that!

Measuring to do at home.

- Design a pair of stilts together so that when your child stands on them s/he is 50cm off the ground. Work out how much wood is needed to make the stilts. What length of trousers would have to be worn to hide the stilts?
- Imagine you need to buy wallpaper for a room. Together find out how much paper is on a roll and, using this information, and the room's measurements, work out how much paper is needed.
- For good health people should drink two litres of water a day. Work out how many litres your family should drink in a week.
- Find out how much it costs to buy a kilogram of potatoes in the form of crisps. Compare the price with the cost of uncooked potatoes..
- Find out how long is spent traveling to and from school in a week, month and half-term.

How many litres of milk will we need to last for the weekend?

Units of measurement

10 millimeters (10mm) = 1 centimeter (1cm)
10 centimeters (10cm) = 1 decimeter (1dm)
100 centimeters (100cm) = 1 metre (1m)
10 decimeters (10dm) = 1 metre (1m)
1000 metres (1000m) = 1 kilometer (1km)

1000 grams (1000g) = 1 kilogram (1kg)
1000 kilograms (1000kg) = 1 tonne (or metric ton)
10 milliliters (10ml) = 1 centiliter (1cl)
1000 milliliters (1000ml) = 1 litre (1l)

In this country when we talk about

measuring distance, mass and capacity there are still many people who prefer to use the imperial units such as yards, feet and inches, pounds and ounces, and pints. However, primary children have been taught to use metric units since the early



1970s. The useful thing about metric units is that they link well with place value, (patterns of 10) including decimals, and this helps with calculation.

At a party 28 handshakes were exchanged. Each person shook hands exactly once with each of the others. How many people were present?

When asked his age, a man replied that when it was divided by 2, 3, 4 or 6 there was one left over in each case. When his age was divided by 7 there was no remainder. How old was he?

Three numbers add up to 14. Multiplied together they come to 84. Find the numbers.

$$\begin{array}{r} \square \quad 7 \quad 2 \\ 3 \quad \square \quad 8 \\ \hline 4 \quad 7 \quad \square \end{array}$$

6	+		=	14
+		+		+
	+	9	=	16
=		=		=
13	+		=	

20	-	12	=	
+		+		+
25	-		=	13
=		=		=
	-		=	

Primary Mathematics Challenge

Try some questions from a National Mathematics Challenge aimed at Year 6 children:

- * If Gurtek is 8 years old and Surjeet is half her age, what age will Surjeet be when Gurtek is 20?
⇒ A 10 B 16 C 24 D 30 E 40
- * An octopus has eight tentacles. How many tentacles do eighty-eight octopi have?
⇒ A 64 B 88 C 704 D 888 E 6464
- * The sum of two numbers is 9 and the product of the same two numbers is 18. What is the difference between them?
⇒ A 2 B 3 C 4 D 5 E 6

- * I roll five dice once and add the scores. What is the difference between the highest total and the lowest total I could get?
⇒ A 5 B 20 C 25 D 29 E 30
- * Erica bought a pencil, a rubber and a ruler for £1. Fritz bought three pens for 75p. Geraldine bought two rubbers and a pen for 45p. Horace bought a pencil, a ruler and a pen. How much did he



- have to pay?
⇒ A 35p B 65p C 85p D £1.15 E There is not enough information.
- * A regular hexagon has a perimeter of 60cm. How long is each side?
⇒ A 10cm B 12cm C 15cm D 20cm E 30cm

