Maths

This week for maths we are going to focus on problem solving and using the knowledge we have to do this. This will take the form of investigations for the children to carry out. Each investigation constitutes one lesson of maths.

Zios and Zepts

On the planet Vuv there are two sorts of creatures. The Zios have 3 legs and the Zepts have 7 legs.

T he great planetary explorer Nico, who first discovered the planet, saw a crowd of Zios and Zepts. He managed to see that there was more than one of each kind of creature before they saw him. Suddenly they all rolled over onto their backs and put their legs in the air.

He counted 52 legs. How many Zios and how many Zepts were there?

Do you think there are any different answers?

Reach 100

Here is a grid of four "boxes":

You must choose four **different** digits from $1-9$ and put one in each box. For example:

5	2
1	9

This gives four two-digit numbers:

52(reading along the 1st row)
19(reading along the 2nd row)
51(reading down the left hand column)
29(reading down the right hand column)

In this case their sum is 151.

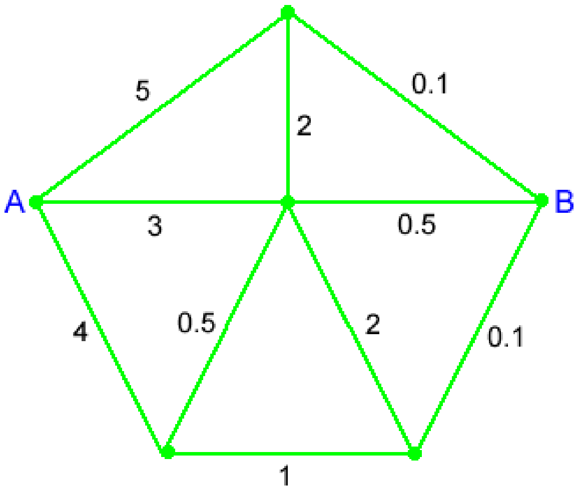
Your challenge is to find four **different** digits that give four two-digit numbers which add to a total of 100.

How many ways can you find of doing it?

Route Product

Remember to find the product you multiply.

There are lots of different routes from A to B in this diagram:



The idea is to work out the product of the numbers on these different routes from A to B. Let's say that in a route you are not allowed to visit a point more than once.

For example, we could have 3×0.5 but we couldn't have $3 \times 2 \times 5 \times 4 \times 1 \times 0.1$ because that route passes through A twice.

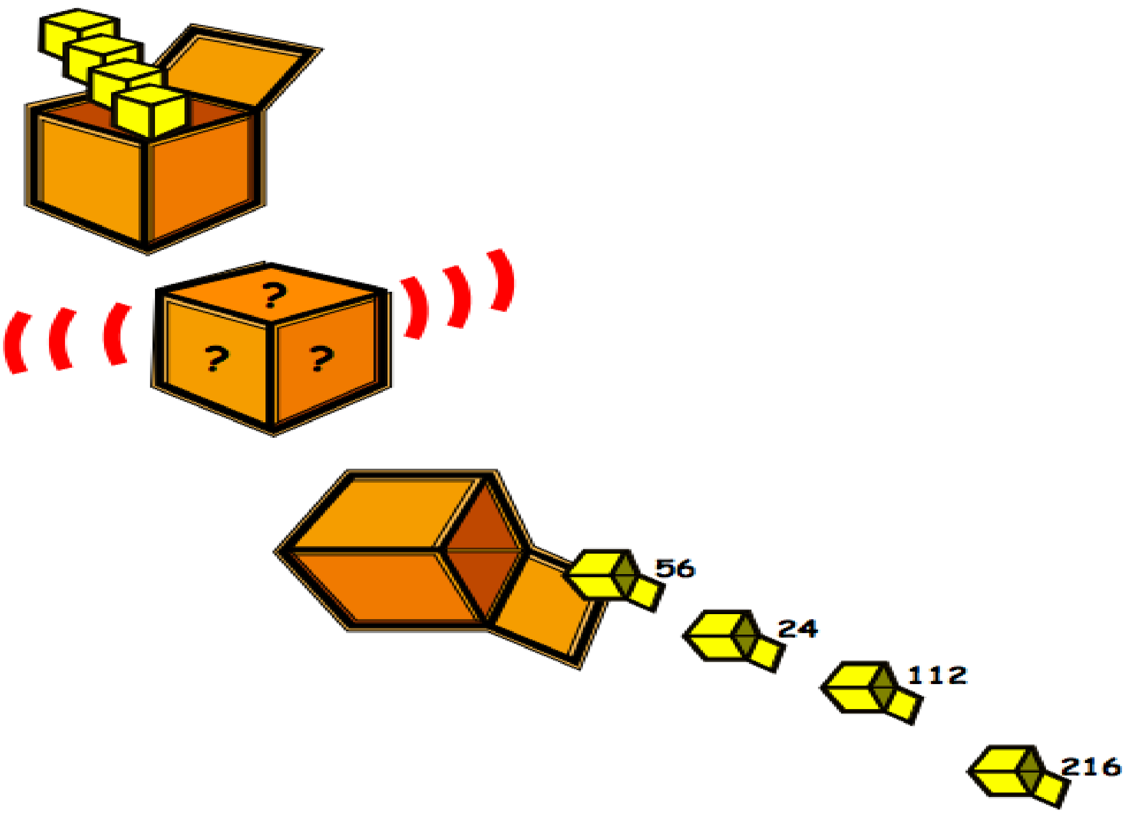
Which route or routes give the largest product?

Which route or routes give the smallest product?

Do you have any quick ways of working out the products each time?

What's in the box?

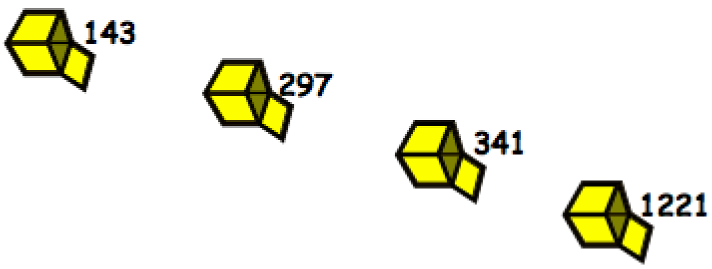
Four numbers in little boxes are put into a special big box that does a multiplication, then four new numbers come out at the end:



We only used whole numbers to go in, so, what multiplication might have gone on in the big box to get the answers in the picture above?

What was the largest number that could have been used to multiply by, in that big box?

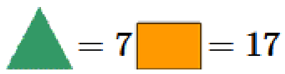
Imagine four new boxes now (with new numbers in) and the large box multiplying by a different number this time. The numbers that come out are these:



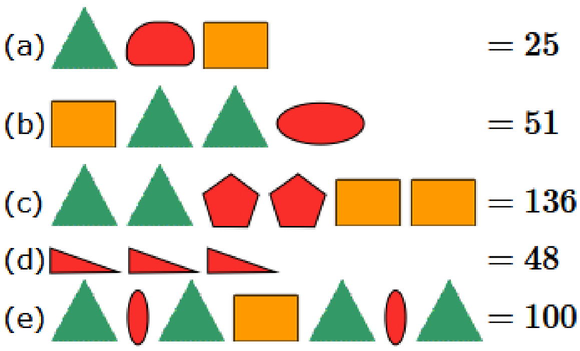
What would be the number that the big box is multiplying by?
How are you working these out?

Super Shapes

Each of the following shapes has a value:



The value of the red shapes changes in each of the following problems.
Can you discover its value in each problem, if the values of the shapes are being added together?



Amy's Dominoes

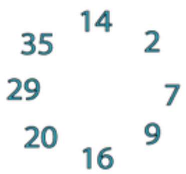
Amy has a box containing ordinary domino pieces but she does not think it is a complete set.

She has 24 dominoes in her box and there are 125 spots on them altogether.

Which of her domino pieces are missing?

Cycling Squares

In the circle of numbers below each adjoining pair adds to make a square number:



For example,

$14 + 2 = 16, 2 + 7 = 9, 7 + 9 = 16$

and so on.

Can you make a similar - but larger - cycle of pairs that each add to make a square number, using all the numbers in the box below, once and once only?

2, 3, 4, 5, 6, 8, 10, 11, 12, 13,
14, 15, 17, 19, 21, 28, 30, 34.