



Starter Questions

Here are some warm-up questions to get your brains working. Discuss them with each other and with your supervising teacher.

No calculators are allowed!

The number 6 is a perfect number as its factors 1, 2 and 3 add up to 6.
It can also be written as: $(1 + 2) \times 2$

The number 28 is a perfect number as its factors 1, 2, 4, 7 and 14 add up to 28.
It can also be written as: $(1 + 2 + 4) \times 4$

The next perfect number can be written as: $(1 + 2 + 4 + 8 + 16) \times 16$.
What is the number and what are its factors?

You might like to go away and find the next perfect number that can be written like this.
All I will say is that it is less than 10 000 and is a multiple of 8. Good luck!!!

Which is the larger: 4^{10} or 10^4 ?

$5!$ Is a short way to write: $5 \times 4 \times 3 \times 2 \times 1$

What is the last non-zero digit in $20!$?

If the circumference of my bicycle wheel is 1.2m and I cycle the 1km to school how many complete turns will my cycle wheel make assuming no slipping or sliding?

Jack, Will and Sarah go on a picnic and each takes with them 10 sweets, 10 sandwiches and 10 cupcakes as well as some drinks. They stop for refreshments in the morning and Jack eats 2 of each, Will eats 3 sandwiches and Sarah a sweet and 2 cupcakes. At lunch Will gives Jack 2 sweets and Sarah 3 cupcakes. Jack gives Will 2 sandwiches and 2 cupcakes while Sarah gives Will 2 sandwiches and a cupcake. They then sit down for lunch and Will has 2 sandwiches, a sweet and a cupcake while Jack and Sarah each eat 3 sandwiches and a cupcake.

What does each have left for afternoon tea?

If you have a 2-digit number, reverse the digits and subtract the two numbers to find the positive difference then which pairs will give you a square number?

If three of you stand in line for a photograph then there are 6 possible line –ups. Can you write them all down? What if there were 4 of you? There would be, in fact, 24 possible ways to line up. Can you find a simple way of showing this to be true? What if there were 5, 6, 7..... of you in the line? You might ask yourself how long it would take you to go through all the possible lines if there were 12 of you. (Allow yourselves 1 second to change each time – very generous!!!!!!)

Interestingly, how old are you if you are 1 000 000 days old – approximately???????