



KS2 Work Book
Newnham College Family Day

Hello there! My name is Philippa Fawcett and I love Maths!



I was born a long time ago, on 4 April 1868. My Mum helped found Newnham College when I was only three. I loved Newnham so much, I decided to go there when I was old enough. I often studied Maths for up to six hours every day. I came first in the whole University in the Mathematical Tripos Examinations - the first

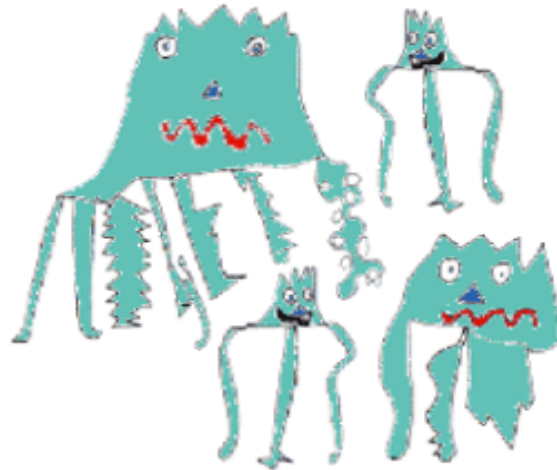
woman to do so. I taught Maths at Newnham and helped set up an education system for people in need in South Africa.

Would you help me solve some Maths problems now? I have hidden the challenges around the wildflower garden with some Newnham teddy bears. As you go round, can you spot the secret code number on each challenge? When you put them together, come back to the Welcome Desk and we can give you a prize!

Challenge number 1: Zios and Zepts

Secret code number: _____

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



The great planetary explorer Nico, who first discovered the planet, saw a crowd of Zios and Zepts. He noticed that there was more than one of each kind of creature. 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 to this that would work?

If you're stuck...

Drawing some pictures or using sticks/counters for legs might help.

Do you have any idea approximately how many Zios and Zepts there might be to make 52 legs?

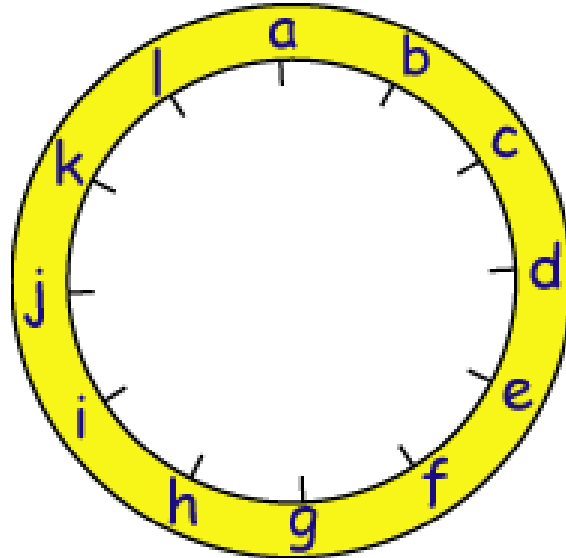
Try choosing a certain number of Zios and a certain number of Zepts, then count their legs. Do you need more legs or fewer to have a total of 52?

Challenge number 2: A Mixed-up Clock

Secret code number: _____

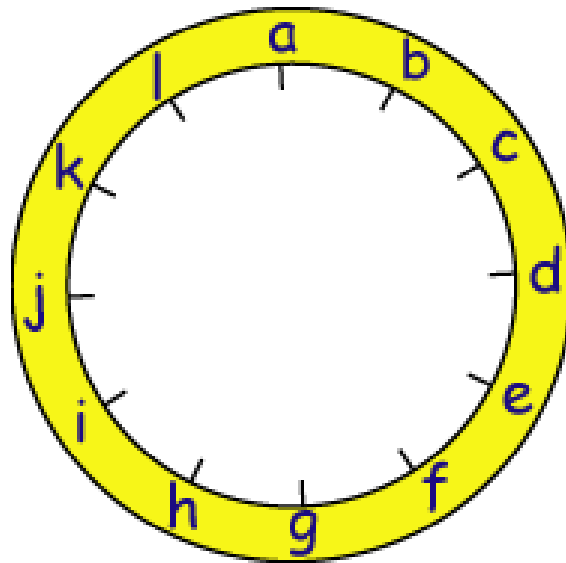
The numbers on this clock-face have become all mixed up. Can you find out where all the numbers have got to from the 10 statements below?

Here is a clock-face with letters to mark the position of the numbers.



4. No even number is between two odd numbers.
5. No consecutive numbers are next to each other.
6. The numbers on the vertical axis (a) and (g) add up to 13.
7. The numbers on the horizontal axis (d) and (j) also add up to 13.
8. The first set of 6 numbers [(a) - (f)] add to the same total as the second set of 6 numbers [(g) - (l)].
9. The number at position (f) is in the correct position on the clock-face.
10. The number at position (d) is double the number at position (h).
11. There is a difference of 6 between the number at position (g) and the number preceding it (f).
12. The number at position (l) is twice the top number (a), one third of the number at position (d) and half of the number at position (e).
13. The number at position (d) is 4 times one of the numbers adjacent (next) to it.

Here is a clock-face with letters to mark the position of the numbers so that the statements are easier to read and to follow.



If you're stuck...

Can you find a statement that gives you a definite number that you know is right?

Can you now find some more that follow on from this one?

Challenge number 3 – Buying a Balloon

Secret code number: _____



Lola bought a balloon at the circus. She paid for it using six coins.

How much might the balloon have cost?

What is the largest amount Lola could have paid?

What is the smallest amount Lola could have paid?

Imagine that Lola has two different types of coin.

How much might the balloon cost now?

Can you find all the possible prices? How do you know you have found them all?

Which of your answers seems a reasonable amount to pay for a balloon?

If you're stuck...

What is the largest amount of money we could make?

What is the smallest amount we could make?

How will we know when we have all the possibilities?

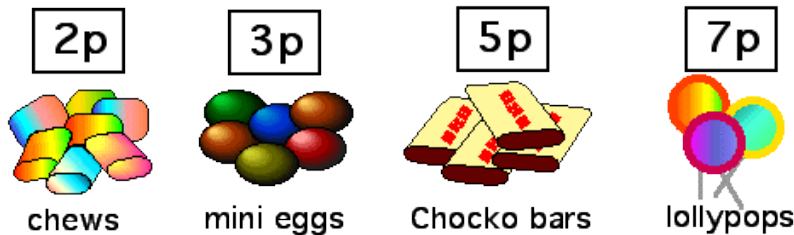
You could try all the combinations with just 1ps and 2ps first.

Challenge number 4: The Puzzling Sweet Shop

Secret code number: _____

Rosie went into the sweet shop with 10p to spend.

There were chews for 2p, mini eggs for 3p, Chocko bars for 5p and lollipops for 7p.



What could she buy if she wanted to spend all her money?

Alice, James, Katie and Henry went into the shop too. They each had 20p to spend and they all spent all of their money.

Alice bought at least one of each kind of sweet. Which one did she have two of?

James spent his money on just one kind of sweet, but he does not like chews. Which sweets did he buy?

Katie bought the same number of sweets as James but she had 3 different kinds. Which sweets did she buy?

Henry chose 8 sweets. What could he have bought?

Rosie could buy _____

Alice could buy _____

James bought _____

Katie bought _____

Henry could buy _____

If you're stuck...

Think of ways that 10 and 20 can be divided up.

Answers:

Challenge 1: Zios and Zepts

1 Zios = 3 legs

8 Zios have = $3 \times 8 = 24$ legs

1 Zepts = 7 legs

4 Zepts have = $7 \times 4 = 28$ legs

So total number of legs = $24 + 28 = 52$

So the answer is there are 8 Zios and 4 Zepts on the planet.

Challenge 2: A Mixed-up Clock

A = 2, B = 9, C = 3, D = 12, E = 8, F = 5, G = 11,

H = 6, I = 10, J = 1, K = 7, L = 4

A = 2, B = 9, C = 3, D = 12, E = 8, F = 5, G = 11,

H = 6, I = 10, J = 1, K = 7, L = 4

Challenge 3: Buying a Balloon

Here are some correct results:

With the 1p, the 2p and the 5p, she could have paid 11p, 12p, 13p, 14p, 15p, 16p, 17p, 19p, 20p or 23p.

With the 5p, the 10p and the 50p, she could have paid 80p, 85p, 90p, 95p, £1.25, £1.30, £1.35, £1.70, £1.75 or £2.15.

Challenge 4: The Puzzling Sweetshop

Rosie can buy:

one lollypop and one mini egg.

one chocko bar, one mini egg and one chew.

Alice bought two mini eggs. This is the only combination of sweets which add up to 20p where she bought at least one set of every sweet.

James bought 4 chocko bars. This is the only sweet that has a price that can divide into 20p exactly when chews are not included.

Katie bought 2 chocko bars, one lollypop, and mini egg.

Henry bought one chocko bar, one mini egg, and 6 chews.

Secret Code

Can you work out the secret code to win a prize?

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Collect your prize from the welcome desk!

Well done and thank you for helping me!



Philippa Fawcett



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