

KS1 Problem

The Gingerbread Man

The Gingerbread Man is being chased by lots of different people and animals.

The people have 2 legs each.
The cats have 4 legs each.
The insects have 6 legs each.
The spiders have 8 legs each.

What could be chasing the Gingerbread Man if there are 12 legs in total?

Think of some different combinations of people and animals that could be chasing the Gingerbread Man.



Challenge

Find all the possible combinations for just two types of chaser, for example, how many people and cats could be chasing if there are 12 legs altogether? This would be suitable for Year 2

This could be extended further for three types of chaser and then four types for children in Key Stage 2.

Increasing the total number of legs chasing the Gingerbread Man would also provide further challenge.

Support for Parents and Carers

This problem is helping children to recognise that numbers can be made in different ways. To help children make sense of the problem they could draw the scene with the correct number of legs on each 'chaser' making sure that the total is 12.

When finding different possible answers, children are likely to be quite random and start afresh to get a new combination. However, some children may recognise that two people have four legs altogether, which is the same as one cat. So one cat can be exchanged for two people and vice versa. Other exchanges can also be made between 'chasers' and children should be encouraged to look for these and use them.

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Solution

All possible solutions for 12 legs.

| Number of People | Number of Cats | Number of Insects | Number of Spiders | Total Number of Legs |
|--------------------|--------------------|--------------------|-------------------|----------------------|
| 6 (12 legs) | 0 | 0 | 0 | 12 |
| 4 (8 legs) | 1 (4 legs) | 0 | 0 | 12 |
| 3 (6 legs) | 0 | 1 (6 legs) | 0 | 12 |
| 2 (4 legs) | 2 (8 legs) | 0 | 0 | 12 |
| 2 (4 legs) | 0 | 0 | 1 (8 legs) | 12 |
| 1 (2 legs) | 1 (4 legs) | 1 (6 legs) | 0 | 12 |
| 0 | 3 (12 legs) | 0 | 0 | 12 |
| 0 | 1 (4 legs) | 0 | 1 (8 legs) | 12 |
| 0 | 0 | 2 (12 legs) | 0 | 12 |

This way of systematic working uses the greatest number of people first (the chaser with the fewest legs) and then gradually works down to no people. This is continued for each column until all the possible answers are found. It is important to record this in some way so that combinations are not repeated or missed out.

The system could have started with the spider (the chaser with the most legs) rather than the chaser with the fewest legs.