



KS1 Problem

Little Red Riding Hood

How many different ways can Little Red Riding Hood get from her house to Grandma's house?

She always moves up  or right  (not diagonally).

She uses the trees to hide from the wolf.



Grandma's House



Red Riding Hood's House



Challenge

- What happens if you add an extra row of trees? Use the page at the end for this. Will there be more or fewer possible journeys?
- If there was an extra column of trees, would this give a different answer to an extra row of trees?

Can you spot any patterns that are made in the number of journeys when you add an extra row or column of trees? Can you predict how many journeys there will be each time you add another row or column of trees?

Support for Parents and Carers

This problem is aimed at children recognising that there are different ways to travel from one place to another. It would be useful for the children to act out the journey using a small toy figure, such as a Lego person.

Encourage your child to keep track of their journeys, recording the directions after each 'move'. This will help them to keep track. They may be quite random in the solutions they find. To help them work out whether they have found all possibilities, the children will need to use a system, and it may be useful to record these in a table such as the one in the solution section.

When solving the challenges, encourage children to look for patterns in the number of solutions to enable them to make predictions about how many journeys they think there might be if more rows or columns of trees are added.

Solution

Journey	Move 1	Move 2	Move 3	Move 4
1	Up	Up	Right	Right
2	Up	Right	Up	Right
3	Up	Right	Right	Up
4	Right	Up	Up	Right
5	Right	Up	Right	Up
6	Right	Right	Up	Up

There are 6 possible ways of moving from Red Riding Hood's house to Grandma's house

Challenge Solution (Where there is an extra row of trees)

Journey	Move 1	Move 2	Move 3	Move 4	Move 5
1	Up	Up	Up	Right	Right
2	Up	Up	Right	Up	Right
3	Up	Up	Right	Right	Up
4	Up	Right	Up	Up	Right
5	Up	Right	Up	Right	Up
6	Up	Right	Right	Up	Up
7	Right	Up	Up	Up	Right
8	Right	Up	Up	Right	Up
9	Right	Up	Right	Up	Up
10	Right	Right	Up	Up	Up

There are 10 possible ways of moving from Red Riding Hood's house to Grandma's house

KS1 Problem

Having an extra column of trees instead of an extra row would result in the same number of possible journeys. Instead of there being **three up moves** and **two right moves** for each journey, there would be **three right moves** and **two up moves**.

3 rows of trees results in 6 possible journeys.

4 rows of trees results in 10 possible journeys (an increase of 4).

5 rows of trees results in 15 possible journeys (an increase of 5).

