

Helping your child to solve problems in mathematics at home



A major goal of education is to help children learn in ways that enable them to use what they have learned to solve problems in new situations. Up to now mathematical problems will have often occurred incidentally during activities and role play. This should still be encouraged. For our youngest children the process of making decisions about the approaches and material are just as important as the calculations that they do. As a parent you need to challenge their choices or methods. Get them to explain their thinking as well as connect what they already know with new situations. By solving problems children get a much better feel for what mathematics is all about and what it can do.

Maths problems can be inspired from daily life, hobbies, stories or their favourite film.

For example from the film Madagascar, can your child find a container big enough to fit Gloria the hippopotamus in?

The selection and use of strategies is a part of the process of problem solving.

An understanding of specific problem solving strategies helps make problems clearer, simpler and more manageable. It also helps children develop better problem solving skills.

- **Act it Out** (this includes using equipment)
- **Draw** (this includes drawing pictures and diagrams)
- **Think** (this includes using skills you already know)

Alongside these children also need to begin to develop other problem solving skills such as: being systematic; looking for patterns and keeping track of what they have already done or written.

According to Mayer and Wittrock (2006), pupils need to have four kinds of knowledge in order to be successful problem solvers:

Knowledge of facts, such as "there are 100 pennies in a pound";

Knowledge of concepts, such as knowing what place value means in arithmetic;

Knowledge of strategies, such as how to break a problem into parts or how to find a related problem;

Knowledge of procedures, such as, how to carry out short division.

How do I get my child to think, reason and explain?

The quality of questioning is crucial in helping pupils develop mathematical ideas and improve their thinking skills. Open questions provide a greater challenge for your child and will also allow them to answer the question at their own level. If they get stuck try not to jump in with the answer straight away, give them time to think things through. The following type of questions will help your child to think and explain about the process rather than just achieving the answer.

How can we get started on this problem?

What do you already know that will help you?

What patterns can you see?

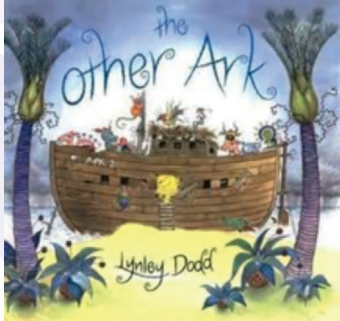
What reason might there be for these patterns? Which of your methods were best?

Why? Can you explain what is happening when ...? Is there a rule? What could we look at next? What strategies have we learned for next time? If you were doing this investigation again what would you do?

Activities and ideas to help your child with problem solving at home

Problem solving in Stories

When reading with your child look for opportunities to practice problem solving.



The following activities link to the book: The Other Ark by Lynley Dodd

How many pigs? How many elephants? How many animals is there altogether on page 4? How many windows are there in the ark? How many animals have patterned skin? Count in twos. How many lots of twos in page 6? Look at page 8, can you make a matching pattern? Give your child a cut-out outline of a camel and hippo to create their designs in. On page 12, how many steps are there on the ladder? How many steps would there be two ladders? If I have already climbed three steps, how many more steps will I need to climb? Create your own animal with a repeating pattern. Make up a name for it.

Daily life opportunities

In the kitchen

How many cuboids, spheres and cylinders can you see in the cupboard?
Fractions: talk about finding half an object (cake) or a quantity (box of eggs). If you have 8 sweets and you share them with your brother, how many sweets do you get each?
I have 4 oranges. If I buy 7 more, how many do I have altogether?

For further information visit www.bexleyeis.co.uk

In the bathroom

Which container holds the most? How many capfuls does it take to fill up a bottle?

In the bedroom

Time the children getting dressed. Who is the quickest? Who is the slowest?
What is the time? What time will it be in one more hours time? Which is earlier 5am or 7am?

In the garden

How many slabs are there around your garden? What is one more? What is one less? Count the pots, steps, flowers and petals. Can they count them in twos? Which is the tallest plant? Which is the shortest plant?
Give your child a bucket of water and a paint brush. Can they write their numbers up to 20 on the fence or on the patio?
Ask your child to build an ark to house the animals from the story, 'The Other Ark'.
Build a bridge and at one end place three cars. How many different ways could two cars go across the bridge? (For example, in order of colour, first the yellow car and then the blue car). How many different ways could three cars go across bridge, one after the other?



Games:

Dominoes: Pick a domino from a set facing down. Ask your child, what is the total number of dots and how many more they need to make 20?



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