

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. By solving problems children get a much better feel for what mathematics is all about and what it can do.

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 procedures, such as how to carry out short division;

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

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.

- Guess (this includes ‘guess and check’ and ‘guess and improve’)
- Act it Out (this includes using equipment)
- Draw (this includes drawing pictures and diagrams)
- Make a List (this includes making a table)
- Think (this includes using skills you already know)



Alongside these, children also need to use other problem solving skills such as: being systematic; keeping track; looking for patterns and working backwards.

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 to your child but will also allow them to answer it at their own level. 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 have you found out?

How did you do that?

What patterns can you see? What reason might there be for these patterns?

Can you explain what is happening when ...?

What other examples can you find to explain how to find the area of a triangle?

What could we look at next?

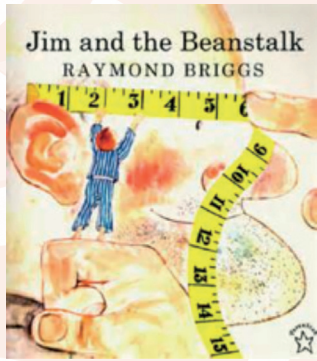
If you were doing this investigation again what would you do?

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

Sporting events, daily life, stories or favourite films allow opportunities for problem solving using knowledge of measure including money, area, perimeter, distance, speed and time. Where possible it is always best to deliver problem solving through your child’s interest, rather than through dry uninspiring problems out of a book.

Problem solving in Stories

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



The following activities link to the book: *Jim and the Beanstalk* by Raymond Briggs

Show your child a piece of clothing from a taller member of the family for example from a grandfather or a pair of Mickey Mouse gloves or a giant pair of glasses. Can your child estimate how tall the giant may be? Look at the page with the glasses on. Can they estimate how long the glasses are? Get them to explain their reasons. Based upon the size of the glasses and the circumference of the giants head, can your child work out the size of his feet? (Measure your child's head and feet to help.)

If the giant is 10,000mm tall, what would his height be in centimetres and metres? Discuss different units used to measure heights for example: a child in cm and an adult in metres or in feet and inches and a horse in hands.

If a human drinks a mug of tea that is 300ml, what would be the volume of the mug that the giant holds?

If every metre of beanstalk has two leaves and 3 new beans, how many does 10 m have? The giant has collected 12 leaves, how tall is the stalk now? How many beans should the giant have?

For further information visit www.bexleyeis.co.uk

Daily life opportunities

In the kitchen

Mugs

You need a 1 litre measuring jug and a selection of different mugs, cups or beakers.

- Ask your child to fill a mug with water.
- Pour the water carefully into the jug.
- Read the measurement to the nearest 10 millilitres.
- Write the measurement on a piece of paper.
- Do this for each mug or cup.
- Now ask your child to write all the measurements in order.



In the bedroom

Challenge your child to spot 20 right angles in it.

Clubs and hobbies

7 people play in a netball team. How many players will there be in 6 teams?

A football game lasts for 90 minutes and has a 15 minute break in the middle. If it starts at 5pm, what time will it finish?

When a team wins a football game, they gain 3 points. If they draw, they gain one point. If a team has 17 points, how many games could they have won and drawn?

Games:

Darts: What is the fewest amounts of darts that you need to make 301?



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