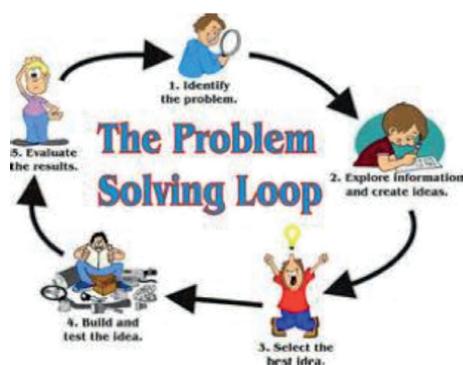


# Helping your child to solve problems in mathematics at home

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.

There are several steps that children need to go through in solving most mathematical problems. These are:



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.

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 to your child but will also allow them to answer it at their own level. If they get stuck try not to jump in with the answer, give them time to think thing 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 other way could you start this calculation/investigation?**

**What do you already know that will help you?**

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

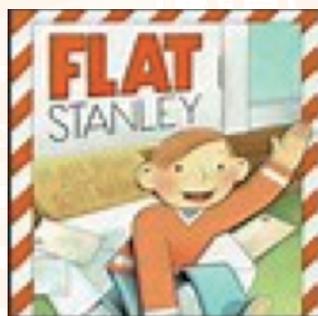
**Which of your methods were best? Why?**  
**Can you explain what is happening when ...?**  
**Is there a rule?**  
**What could we look at next?**  
**What strategies have we learned for next time?**  
**If you were doing this investigation again what would you do?**

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

Daily life, hobbies, 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 a dry uninspiring text book.

### Problem solving in Stories

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



### The following activities link to the book: Flat Stanley by Jeff Brown

Measure and make your own envelope so that you can fit inside it. Look at page 6: What are your own measurements? Look at the difference between an inch and a centimetre. If your arm is 10 inches long, how many centimetres is that? Convert your measurements into millimetres. How many inches thicker are you compared to Stanley? Make a kite of different shapes. Look at where California

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is on a map. Talk about the time difference between different countries. If it is twelve o'clock in London, what time is it in Paris? Look at the coins 5c = a nickle, 10c = a dime and 25c is a quarter. Solve money problems using American money.

### Daily life opportunities

#### In the kitchen

How heavy are two bananas? Estimate quantities and measure the mass. Estimate capacity. How much sugar is there in a teaspoon, tablespoon? Work out how many teaspoons and/or table spoons there are in a bag of sugar, a jar of coffee etc.

#### In the bathroom

How long does it take you to brush your teeth? How much time do you spend in a week brushing your teeth? How could we use this information to work out how much time you spend in a month?

#### In the garden

Measure the length and width of your garden. How many steps are there around your garden?

#### Games:



#### Circle trios

Draw four circles each on your piece of paper. Write four numbers between 3 and 18, one in each circle.

12

16

8

17

- ◆ Take turns to roll a dice three times and add the three numbers.
- ◆ If the total is one of the numbers in your circles then you may cross it out.
- ◆ The first to cross out all four circles wins.

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