Tips for 'Problem Solving'

BOURNE GRAMMAR SCHOOL Mathematics

1. **Understand the problem** – what are you being asked to do?
   - Read the question carefully.
   - Identify the key points and information (highlighter pen is useful here).
   - Is there information not stated which you can deduce?
   - Read the question again!

2. **Choose a strategy** – have a think, could you:
   - Draw a picture/diagram.
   - Organise information in a table.
   - Draw a flowchart.
   - Draw a number line.
   - Draw a bar model.
   - Use easier numbers to see what method works.
   - Make an equation.
   - Write down any useful formulae.
   - Work backwards through the problem.
   - Estimate first then check.

3. Still stuck? **Don't panic – just stop and think!**
   - Are you sure you thought carefully about the list of strategies?
   - Is there anything you can do? – Sometimes you can work out something you haven't been asked to find, but that may will link you to the next step or a later step.
   - Is your work easy to read? – Maybe you need a tidy up; it is easier to make links from clear working.
   - Is your work cramped/too many crossed out mistakes? – Start again.
   - Can you alter your strategy?
   - Can you find an efficient strategy?
   - Apply what you've learned from your previous work to make your next attempt even better.
   - Review what you have done so far – There may have been a point where you could have gone in a different direction.

4. **Communicate** your ideas with your partner (if it's not a test!)
   - It may be that you have all the key information between you needed to complete the problem.
   - Perhaps if you explain your ideas to each other something else may occur to you.

5. **Persevere**
   - Keep at it – You definitely won't solve it if you give up.
   - Come back to the problem, if you have time – Often if you can't find the solution straight away, leaving the problem and coming back to it with 'fresh eyes' helps.
   - If you are thinking/saying that the problem is too hard then you are using up brain power thinking about how difficult the problem is instead of trying to solve it!

Getting better at problem solving – When you think you've answered the problem:

- Can you convince someone else that you have solved it?
  - "A mathematical theory is not to be considered complete until you have made it so clear that you can explain it to the first man whom you meet on the street" – David Hilbert
- Did you miss any special cases? Could your solution be flawed?
- Could you change the problem in any way to make a new investigation which is similar?
- Make a mental note of what techniques worked well for you this time?