

Problem Solving at Key Stage 4/5

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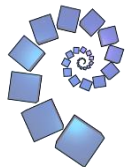
Aims of the session

Reflect on our own problem solving process

Understand a heuristic for solving maths problems

Explore ways of helping our students to become better problem solvers

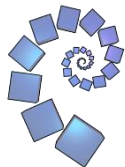
Learn how to find resources on NRICH



Try some problems

Choose one or two problems from the Short Problems worksheets.

As you work on the problem, jot down any general problem-solving strategies you use.



How to Solve It

How to Solve It (1945) is a small volume by mathematician George Pólya, suggesting the following steps when solving a mathematical problem:

First, you have to *understand the problem*

After understanding, then *make a plan*

Carry out the plan

Look back on your work.



Understanding the problem

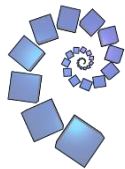
Restate the problem in your own words

What area of mathematics is this?

What exactly am I being asked to do?

What do I know? What do I need to find out?

What am I uncertain about?



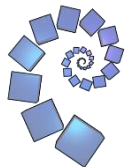
Devising a plan

Work out the first few steps before leaping in!

Have I seen something like it before?

Is there a diagram I could draw to help?

Is there another way of representing?



Carrying out the plan

I'm STUCK! How do I get UNSTUCK?

Reread the problem

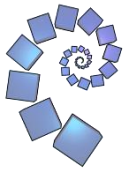
Work backwards

Identify subgoals

Simpler problem, special cases

More general case

Guess and check



Looking back

Have I answered the question?

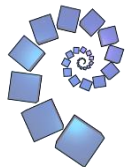
Does it make sense?

Have I fully solved the problem?

Is my solution consistent?

What have I learned?

Would I solve the problem the same way next time?



Multiple Solution Methods

Kite in a Square

Steel Cables

What's it Worth?

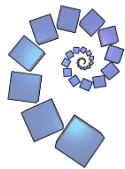


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