

# Problem solving

## What you need to know

### *In developing a strategy, you need to know how to:*

- establish opportunities for using problem solving skills over an extended period of time (eg in a programme of study, project or work to be carried out over three months or so);
- identify the outcomes you hope to achieve (eg an appropriate methodology for a study, a solution to resource difficulties in managing a project, an improved product design or system);
- explore problems by:
  - re-framing each problem (eg broadening the focus to include wider impact, re-visualising the problem by creating different perspectives, reviewing changes over time or location);
  - simplifying the problem by dividing into sub-problems, discounting misleading information;
  - making comparisons (eg drawing on similar problems, finding analogies with other situations);
- research information from other sources, consulting appropriate people and reference material (eg line manager, specialists, customers or colleagues affected by the problem; reference texts, technical manuals, the internet) to help establish the critical features of the problem;
- plan your use of problem solving skills in tackling selected problems, taking into account factors they may affect your plans (eg financial, health and safety, resources, timescale, attitudes to risk, level of own expertise), and record information in forms that are useful for the next stage of your work (eg a record of the outcomes from a critical-path analysis, a concept map, flowchart);
- make a reasoned selection of methods (eg collaborative, visual, verbal, numerical, auditory, physical) that are likely to provide the quality of outcomes required.

### *In monitoring progress, you need to know how to:*

- generate a variety of ways of tackling problems (eg by means-ends analysis, fluency exercises, brainstorming, word diagrams, surveying, use of graphics, 2D and 3D models, imagination);
- identify options that have a realistic chance of success (eg use a decision tree, risk analysis);
- negotiate the option to be taken forward (eg with line manager, tutor, people affected);
- manage each stage of the work effectively by:
  - obtaining the necessary resources, specialist knowledge, skills and cooperation of others;
  - using appropriate methods (eg collaborative, visual, verbal, auditory, numerical, physical);
  - keeping track of progress (eg to maintain momentum, to spot and correct errors);
  - using appropriate procedures to check results (eg to test, observe, measure, sample, inspect);
- monitor and critically reflect on your use of problem solving skills, including:
  - obtaining feedback from others (eg line manager, specialists, people affected by the problem);
  - noting choices made and judging their effectiveness (eg impact on the quality of work);
- adapt your strategy to overcome difficulties and produce the quality of outcomes required.

### *In evaluating strategy and presenting outcomes, you need to know how to:*

- select appropriate methods to illustrate the problem solving process and present results (eg written material, an oral presentation, visual material, a demonstration or working model, products);
- present information clearly and accurately, with evidence to support your conclusions (eg a log used to monitor the process...photographs before and after, products);
- assess the effectiveness of your strategy, identifying factors that had an impact on the outcomes (eg resources, time, environment, level of own expertise);
- identify ways of further developing your problem solving skills.

## What you must do

*You must:*

Provide at least **one** example of meeting the standard for PS4.1, PS4.2 and PS4.3. The example should show that you can explore at least two problems (for PS4.1), one of which must be followed through to conclusion.

### Evidence must show you can:

<p><b>PS4.1</b></p> <p>Develop a strategy for problem solving.</p>	<p>4.1.1 identify opportunities for problem solving and clearly establish what you hope to achieve;</p> <p>4.1.2 explore problems to identify their critical features and devise different ways of tackling them;</p> <p>4.1.3 negotiate with appropriate people the approach to use and plan how you will implement this.</p>
<p><b>PS4.2</b></p> <p>Monitor progress and adapt your strategy for solving the problem.</p>	<p>4.2.1 manage effectively and efficiently the problem solving process, using appropriate methods;</p> <p>4.2.2 keep track of progress and systematically check results;</p> <p>4.2.3 reflect critically on your approach to tackling the problem and adapt your strategy as necessary to improve your problem-solving skills.</p>
<p><b>PS4.3</b></p> <p>Evaluate your strategy and present the outcomes of your problem solving skills.</p>	<p>4.3.1 bring together and clearly present the results of your approach to problem solving, including evidence to support your conclusions;</p> <p>4.3.2 agree with appropriate people the extent to which the problem has been solved;</p> <p>4.3.3 assess the effectiveness of your strategy, including factors that affected the outcomes, and identify ways of further improving your problem solving skills.</p>