

# Application of number

## What you need to know

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

- establish opportunities for using application of number 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 accurate analysis of research data, best use of limited finance for a project, an improved product design or production method);
- identify relevant sources of information, including people and reference material (eg line manager, specialists...colleagues; reports, manuals, databases, the internet; sites for direct observations or measurements) and research the information needed for planning purposes;
- plan your use of application of number skills (eg options, sequence of work, resources, level of expertise needed) and make a reasoned selection of methods for achieving the quality of outcomes required, including:
  - formulating hypotheses, using models and other techniques to explore them (eg Gantt charts, network analyses);
  - establishing methods for testing hypotheses (eg using statistical techniques).
- using numerical, graphical and algebraic methods to develop models (eg spreadsheet simulations, formulae and graphical representations);
- using ideas of proportion, variation and scaling, including inverse proportion and other non-linear variation (eg in numerical and spatial calculations, in estimating and forecasting);
- working with expressions, formulae and equations, including powers and roots;
- working with probability (eg calculating the probability of a compound event);
- making deductions in algebraic and spatial reasoning and applying these to your work;
- monitor and critically reflect on your use of application of number skills, including:
  - obtaining feedback from others (eg colleagues, tutor, project supervisor, line manager);
  - 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:*

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

- evaluate information from different sources, developing alternative lines of enquiry where appropriate;
- carry out calculations to appropriate levels of accuracy, drawing on a range of numerical, graphical and other mathematical techniques involved in:
  - making measurements or observations, including use of compound units;
  - reading and interpreting scale drawings, graphs, complex tables and charts;
  - organising and classifying data (eg grouping data, using appropriate software packages);
  - making inferences from sets of data (eg from standard deviations, interquartile range);
- interpret results and identify the main findings from your work, including evidence to support your conclusions (eg examine generalisations and solutions, identifying the reasoning underlying the acceptance or rejection of original hypotheses);
- present information effectively, selecting appropriate methods to illustrate findings, including diagrams, charts and graphs (eg use of non-linear scales to bring out relationships);
- explain results in relation to your work and hypotheses (eg explain patterns of relationship, trends and possible consequences, explain why particular lines of enquiry were followed and others rejected);
- assess the effectiveness of your strategy, identifying factors that had an impact on the outcomes (eg availability of resources, level of own expertise, precision);
- identify ways of further developing your application of number skills.

## What you must do

### You must:

Provide at least **one** example of meeting the standard for N4.1, N4.2 and N4.3 (your example must show you can formulate and test hypotheses, and draw conclusions).

### Evidence must show you can:

<p><b>N4.1</b></p> <p>Develop a strategy for using application of number skills over an extended period of time.</p>	<p>4.1.1 establish opportunities for using application of number skills and clearly identify the outcomes you hope to achieve;</p> <p>4.1.2 identify relevant sources and research the information needed for planning purposes;</p> <p>4.1.3 plan your use of application of number skills, and make a reasoned selection of methods for achieving the quality of outcomes required.</p>
<p><b>N4.2</b></p> <p>Monitor progress and adapt your strategy, as necessary, to achieve the quality of outcomes required in work involving:</p> <ul style="list-style-type: none"> <li>• deductive and inferential reasoning</li> <li>• algebraic modelling.</li> </ul>	<p>4.2.1 evaluate information from different sources, developing alternative lines of enquiry where appropriate;</p> <p>4.2.2 carry out calculations to appropriate level of accuracy, drawing on a range of techniques to suit your purpose;</p> <p>4.2.3 monitor and critically reflect on your use of application of number skills, adapting your strategy as necessary to produce the quality of outcomes required.</p>
<p><b>N4.3</b></p> <p>Evaluate your strategy and present the outcomes of your learning.</p>	<p>4.3.1 interpret results and identify the main findings from your work, including evidence to support your conclusions;</p> <p>4.3.2 present information effectively, selecting appropriate methods to clearly illustrate findings, and explain results in relation to your hypotheses;</p> <p>4.3.3 assess the effectiveness of your strategy, including factors that had an impact on the outcomes, and identify ways of further developing your application of number skills.</p>

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