



# **Core Skills Framework: an introduction**

## **Problem Solving**

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## Introduction

Core Skills enable people to put their knowledge and understanding into action flexibly, adapting them to new situations. Core Skills apply to a wide range of contexts in education and training, in life, and in work. They underpin and promote the development of learning and study skills, and provide a foundation for lifelong learning and personal development.

The importance of Core Skills is now widely recognised in employment and education. Lifelong learning that builds on people's Core Skills is essential if individuals are to fulfil their personal needs and meet the needs of society. In the workplace, employees at every level are increasingly expected to take responsibility for the quality of the products and services they produce or provide. Individuals who can analyse and solve problems, communicate well, use information technology, and work with others effectively, are well-equipped to assume the active, flexible and responsible roles that modern workplaces need.

A wide variety of skills and qualities are developed and used in education and training, in work and in life. Some of these are 'core' to personal development and performance.

First, there are skills for **tackling issues and problems**. These skills include being able to:

- ◆ think critically
- ◆ analyse situations and suggest courses of action
- ◆ plan and organise work and carry it through to completion
- ◆ reflect on what has been done and draw conclusions for the future

Second, there are skills that are vital in enabling individuals to function effectively. **Communication**, both orally and in writing, is essential for clarifying your own thoughts, for relating to others, and for learning and working. The **numerical skills** involved in processing, interpreting, and communicating information can help you to understand, predict, and solve many types of problem. Skills in **using information and communication technology** are increasingly useful for obtaining and analysing information, for organising your ideas, and for communicating and working with others. And being able to **work with others** means having skills that help you to co-operate with others in learning and working situations to identify and achieve your shared goals.

## The Core Skills

Each Core Skill, and its components, can be assessed at SCQF levels 2–6 (Access 2, Access 3, Intermediate 1, Intermediate 2, and Higher).

This section gives you a brief description of each component, and describes the range of activities that its assessment will involve at the different levels.

### Core Skill: Problem Solving

The three components of this skill are the stages involved in tackling issues and problems in personal, social, and work contexts. They are often used in sequence, and repeatedly. Each component can also be a focus of activity in its own right.

#### Component: Critical Thinking

Critical Thinking is about using analysis and reasoning to make decisions and to create or suggest ideas, courses of action, and strategies. Attainment levels range from:

- ◆ working in situations that involve a few, easily-identified factors set in familiar contexts

to:

- ◆ working in more complex situations that require a greater degree of analysis before approaches can be devised

#### Component: Planning and Organising

Planning and Organising is the ability to plan a task, taking account of available resources, and to manage the task to completion. Attainment levels range from:

- ◆ creating plans involving a small number of steps and using familiar resources

to:

- ◆ efficient management of a more complex plan, which may include a review of strategy and a degree of research in identifying the resources to be used

#### Component: Reviewing and Evaluating

Reviewing and Evaluating is the ability to reflect on and review the process of tackling issues and problems, to evaluate the outcomes, and to identify where alternative strategies might have been used. Attainment levels range from:

- ◆ identifying some strengths and weaknesses in a strategy

to:

- ◆ identifying and gathering evaluation evidence, evaluating strategies, and making appropriate recommendations

## **Core Skill: Communication**

Communication skills underpin almost all personal, social, learning, and working activity. They are essential in clarifying your thoughts, in interacting and conversing effectively with others, and in conveying information, feelings, and opinions.

### **Component: Oral Communication**

Oral Communication means being able to take part in discussions and make presentations, interacting with your audience as appropriate. Attainment levels range from:

- ◆ conveying basic information and opinions through short, informal communications on familiar topics

to:

- ◆ presenting and analysing complex information and issues through more sustained discussions or presentations on complex topics

### **Component: Written Communication**

Written Communication is the ability to write and respond to writing. Attainment levels range from:

- ◆ dealing with brief communications expressing a few basic ideas or pieces of information about familiar topics

to:

- ◆ dealing with communications which analyse and explore complex information and issues

## **Core Skill: Numeracy**

To cope with the demands of everyday life, including work and study, people need to be comfortable with numbers and with graphs, symbols, diagrams, and calculators. The skills needed for this involved interpreting, processing, and communicating, quantifiable and spatial information.

### **Component: Using Graphical Information**

This is the ability to interpret and communicate quantifiable information that is given in writing, diagrams, or pictures. Attainment levels range from:

- ◆ working in familiar contexts with simple, specified tables and graphs

to:

- ◆ working in more abstract contexts and with more complex graphical information which may require some analysis, and where decisions have to be made on effective ways to communicate the information

### **Component: Using Number**

This is the ability to apply numerical and other relevant mathematical and statistical skills. Attainment levels range from:

- ◆ working confidently with basic numbers in everyday contexts

to:

- ◆ working confidently with more complex numerical concepts and techniques in more abstract contexts

### **Core Skill: Information and Communication Technology**

Information and Communication Technology is concerned with the electronic collection, organisation, analysis, presentation, and communication of information. It encompasses all media types and formats as well as all relevant tools.

The Core Skill focuses on the ability to use information and communication technology to process information in a variety of ways which will be useful in work and in the home. It is not about developing IT specialists who will act as first-line support for others or install specialist systems.

### **Component: Accessing Information**

This is the ability to use information and communication technology to support a range of information-accessing activities. Attainment levels range from:

- ◆ accessing basic information and communication technology to perform simple processing of familiar data and to select information from a local database

to:

- ◆ making effective, responsible, and secure use of information and communication technology, using software in a context requiring some analysis and design, and retrieving information from a range of sources

### **Component: Providing/Creating Information**

This is the ability to use information and communication technology to provide, create, and process information. Attainment levels range from:

- ◆ using familiar software applications to carry out very simple processing tasks and providing/creating very simple information and communication technology

to:

- ◆ using a range of information and communication technology in unfamiliar contexts, observing security procedures and the needs of other users. Resolving simple hardware or software problems and evaluating information

### **Core Skill: Working with Others**

The fact that Working with Others is a Core Skill emphasises the importance of co-operation and teamwork in social, learning, and working situations. Working with Others has two components: Working Co-operatively with Others, and Reviewing Co-operative Contribution.

While achieving a shared goal is the main focus, co-operation with others should be developed through all stages of any collaboration.

Reviewing your own contribution and learning through reflection also has a wider application to personal development.

### **Component: Working Co-operatively with Others**

This is about using interpersonal skills appropriately, to recognise and value the roles of other people, taking responsibility for your own contribution, and supporting co-operative working in appropriate ways. Attainment levels range from:

- ◆ identifying, with support, your own role and the roles of other people, and helping to achieve a shared goal

to:

- ◆ analysing the roles and behaviour of others and adapting your own behaviour to deal with the complexity of changing and challenging dynamics

### **Component: Reviewing Co-operative Contribution**

This is the ability to discuss the process of working co-operatively with other people, reflecting on and reviewing the collaboration. This might include resolving issues and handling other people's behaviour.

Learners should evaluate the outcomes, identify the value of their own contribution, and reflect on any personal learning and development that may be needed to enhance their contribution to future collaborative work.

Attainment levels range from:

- ◆ identifying some strengths and weaknesses in the way you helped achieve things together, suggesting how your own contribution could be strengthened in the future

to:

- ◆ identifying and gathering evidence, critically evaluating your own contribution, and making appropriate recommendations about future learning and contributions

## **Core Skills certification**

Since 1999, candidates for SQA qualifications have been able to show what they have achieved in Core Skills.

Virtually all Standard Grade candidates should now get a Core Skills profile which will be reviewed each time they achieve a new SQA qualification. There is no need for candidates to achieve all Core Skills, or to complete a Group Award. Their profile will report their Core Skills achievements by component — so Core Skills certification is available to those who do not complete a whole Core Skill.

With increasing emphasis being placed on Core Skills in education (including higher education), training, and employment, it is important that learners are given the opportunity to be credited for what they can do.

Learners can achieve Core Skills through:

- ◆ any Unit or Course which has been audited against the Core Skills framework and validated as fully covering one or more Core Skills component
- ◆ named Core Skills Units

In the former case, certification will be automatic. Candidates will not need to enter for the Core Skill component — the entry on the Core Skill profile will be generated automatically by SQA when they achieve the relevant Unit or Course.

Named Core Skills Units are available for use by schools, colleges, higher education institutions, and training providers, and in the workplace.

## **The purpose of this document**

The remainder of this document provides detailed technical specifications for the Problem Solving Core Skill for use by those designing and auditing Units, Courses, assessment programmes and Group Awards, and by SQA staff.

# Problem Solving

## **Examples of tasks might include:**

- ◆ **Level 2:** Organise a birthday or other celebration for a friend, classmate, or colleague, taking account of individual preferences and resources available.
- ◆ **Level 3:** Troubleshoot a non-functioning DVD player, methodically checking the components to identify the source of the problem.
- ◆ **Level 4:** Cleaning and decorating a bedroom, bed-sit, or shared accommodation.
- ◆ **Level 5:** Draw up, implement, and review a personal revision and study plan for an exam subject.
- ◆ **Level 6:** Devising and implementing a first-day induction programme for a new member of staff.

**Critical Thinking**

**SCQF 2**

**General skill**

Analyse a very simple familiar situation or issue.

**Specific skills**

- ◆ Recognise some main features of the situation or issue
- ◆ Identify a process to deal with the situation or issue, prompted by reference to previous experience

**Further information**

Candidates should be dealing with a routine situation or issue in a context which is familiar. There will be a small number of variables and/or relationships — these will be identified for the candidate. Within this context, the candidate should recognise which of these variables and/or relationships are of most importance to the situation. Thereafter, candidates should, with prompting, suggest a routine, familiar course of action to address the situation based on their previous experience.

**Critical Thinking**

**SCQF 3**

**General skill**

Analyse a simple situation or issue.

**Specific skills**

- ◆ Recognise the main features of the situation or issue
- ◆ Identify a process to deal with the situation or issue

**Further information**

Candidates should be dealing with a situation or issue in a context which is familiar to them. There will be a small number of obvious variables and the relationships between these will be clear to the candidate. In a less familiar situation, the variables and/or relationships should be already identified and understood by the candidate. Within this context, the candidate should identify the main variables and the relationships between them. Thereafter, candidates should suggest a routine, familiar course of action to address the situation based on their previous experience.

**Critical Thinking**

**SCQF 4**

**General skill**

Analyse a straightforward situation or issue.

**Specific skills**

- ◆ Identify the main features of the situation or issue
- ◆ Select an approach to deal with the situation or issue

**Further information**

Candidates should be dealing with a situation or issue in a context which is familiar to them. There will be a limited number of variables and the relationships between these will be clear. Within this context, the candidate should identify the variables and the relationship between them. Thereafter the candidate should evaluate the situation — this might include summarising, explaining, or drawing conclusions — or devising a strategy (ie a technique, procedure, or a course of action) to deal with the situation. There may be several, obvious straightforward approaches to select from, including making a simple modification to a known process.

**Critical Thinking**

**SCQF 5**

**General skill**

Analyse a situation or issue.

**Specific skills**

- ◆ Identify the factors involved in the situation or issue
- ◆ Assess the relevance of these factors to the situation or issue
- ◆ Develop an approach to deal with the situation or issue

**Further information**

Candidates can deal with a situation or issue in a context which is familiar to them where the relationship between the variables requires to be clarified. Alternatively, candidates can deal with a situation in an unfamiliar context where relationships between variables are clear. Within this context the candidate should identify the variables and the relationship between them. Thereafter, the candidate should evaluate the situation — this might include summarising, explaining, or drawing conclusions — or devising a strategy (ie a technique, procedure, or course of action) to deal with the situation. They may devise a new approach or select and/or modify an existing approach.

**Critical Thinking**

**SCQF 6**

**General skill**

Analyse a complex situation or issue.

**Specific skills**

- ◆ Identify the factors involved in the situation or issue
- ◆ Assess the relevance of these factors to the situation or issue
- ◆ Develop and justify an approach to deal with the situation or issue

**Further information**

Candidates will deal with a situation or issue where variables may be complex or unfamiliar, relationships need to be clarified and the context may be unfamiliar. Within this context, the candidate should identify the variables and the relationships between them, analysing the significance and relevance of each variable. Thereafter, the candidate should evaluate the situation — this might include summarising, explaining, or drawing conclusions — or identify a strategy (ie a technique, procedure, or a course of action) to deal with the situation. They may devise a new approach or select and/or modify an existing approach. The approach must be justified, for example, by accounting for the factors or evidence involved, by referring to the resources and time available, and/or by comparison with other possible approaches.

**Planning and Organising**

**SCQF 2**

**General skill**

Plan, organise, and complete a very simple, familiar task.

**Specific skills**

- ◆ Identify some very simple steps in the plan
- ◆ Select appropriate resources to carry out the plan
- ◆ Carry out the task

**Further information**

Candidates will complete a task with a small number of given, clear steps. The resources will be appropriate to the task and might include information, set procedures, people, equipment, or physical resources. The candidate must decide how the task will be carried out and then complete it. At all stages, the candidate may need some prompting, referring to previous experience.

## Planning and Organising

SCQF 3

### General skill

Plan, organise, and complete a simple task.

### Specific skills

- ◆ Identify the sequence of steps in the plan
- ◆ Select appropriate resources to carry out the plan
- ◆ Carry out the task

### Further information

Candidates will complete a familiar task with a small number of steps. If the task is less familiar, the steps should be given and clear. The resources should be selected from a familiar range of common resources or from a given range of familiar resources. The resources will be appropriate to the task and might include sources of information, set procedures, people, and equipment/physical resources. The candidate must decide how the task will be managed and carry it out — this could include allocation of tasks to others.

**Planning and Organising**

**SCQF 4**

**General skill**

Plan, organise, and complete a straightforward task.

**Specific skills**

- ◆ Develop a plan
- ◆ Identify and obtain resources to carry out the plan
- ◆ Carry out the task

**Further information**

Candidates will complete a task in a familiar context. The task will have several obvious possible approaches or involve modifying a known plan, with a limited number of steps/variables, where relationships are clear. The plan will be linear. The resources should be appropriate to the task, and might include sources of information, set procedures, people, and physical resources such as equipment or accommodation. The candidate will select these from a range of familiar sources. The candidate must decide how the task will be managed and carry it out — this could include allocation of tasks in a group context.

## Planning and Organising

SCQF 5

### General skill

Plan, organise, and complete a task.

### Specific skills

- ◆ Develop a plan
- ◆ Identify and obtain resources to carry out the plan
- ◆ Carry out the task

### Further information

Candidates will complete a task in an unfamiliar context where relationships are clear. Alternatively, if candidates are working in a familiar context, the relationships between variables should be unfamiliar. The candidate will develop a plan which might involve branching (more than one concurrent strand). The candidate will identify and obtain the necessary resources, selecting these from a wide range of familiar and unfamiliar sources, possibly involving a search. The resources will be appropriate to the task and might include sources of information, set procedures, people, and equipment/physical resources. The candidate must decide how the task will be managed and carry it out — this could include allocation of tasks in a group context.

## Planning and Organising

SCQF 6

### General skill

Plan, organise, and complete a complex task.

### Specific skills

- ◆ Develop a plan
- ◆ Identify and obtain resources to carry out the plan
- ◆ Carry out the task

### Further information

Candidates should be dealing with a task with a large number of variables in an unfamiliar context where relationships may be unfamiliar. The plan is likely to involve more than one concurrent strand and a review or opportunity to adjust the strategy. The candidate must identify and obtain resources, selecting these from a wide range of familiar and unfamiliar sources, possibly involving a search. The resources will be appropriate to the task and might include sources of information, set procedures, people, equipment, and physical resources. The candidate must decide how the task will be managed and carry it out — this could include allocation of tasks in a group context.

## Reviewing and Evaluating

SCQF 2

### General skill

Review and evaluate a very simple, familiar problem solving activity.

### Specific skills

- ◆ Given some simple criteria, identify the strengths and weaknesses of the solution to the problem

### Further information

Candidates will be dealing with a familiar activity, set in a familiar context, involving a small number of obvious variables.

The candidate must:

- ◆ identify the strengths and weaknesses of a solution, with some prompting, referring to previous experience
- ◆ use given simple criteria, which might be in the form of questions on the effectiveness of time, resources, people, etc

## Reviewing and Evaluating

SCQF 3

### General skill

Review and evaluate a simple problem solving activity.

### Specific skills

- ◆ Identify the strengths and weaknesses of the solution to the problem
- ◆ Use given simple criteria

### Further information

Candidates will be dealing with an activity set in a familiar context, involving a small number of obvious variables and simple task management.

The candidate must:

- ◆ identify the strengths and weaknesses of the solution to the problem — in a simple activity the solution or outcome is likely to be the main or only source of evidence for the evaluation
- ◆ use given simple criteria, which might include questions — eg appropriateness of action, resources used, or workability of the solution or outcome

## Reviewing and Evaluating

SCQF 4

### General skill

Review and evaluate a straightforward problem solving activity.

### Specific skills

- ◆ Identify the strengths and weaknesses of the problem solving strategy
- ◆ Draw a conclusion

### Further information

Candidates will be dealing with an activity set in a familiar context, involving a limited number of factors and straightforward task management.

The candidate must:

- ◆ identify the strengths and weaknesses of all stages of the problem solving strategy — ie analysing the situation, planning and organising the task and the outcome of the activity
- ◆ clearly refer to evidence on aspects of the strategy such as whether all factors were identified; effectiveness of the strategy and planning; suitability of resources; or appropriateness of the outcome
- ◆ draw a conclusion — this should refer to, and consider, the evidence. The conclusion might involve suggesting an alternative or modification to the strategy or plan, making a prediction or a generalisation

## Reviewing and Evaluating

SCQF 5

### General skill

Review and evaluate a problem solving activity.

### Specific skills

- ◆ Evaluate the effectiveness of the problem solving strategy and assess or explain the relevance of the evidence
- ◆ Draw conclusions and justify them with reference to the evidence

### Further information

The candidate can deal with an activity in an unfamiliar context where the relationships between factors are clear. Alternatively, the candidate can deal with an activity in a familiar context where relationships need to be clarified. In both cases, the plan is likely to involve more than one strand and the resources used will be less familiar.

The candidate must:

- ◆ evaluate all stages of the problem solving strategy — ie analysing the situation, planning and organising the task and the outcome of the activity. They may do this using criteria which they have devised. Alternatively, candidates could select evaluation criteria from a range provided or adopt, or adapt, a set of established criteria
- ◆ explain the supporting evidence — this must include some assessment or explanation which goes beyond a mere re-statement of the evidence
- ◆ draw conclusions — this might involve suggestions for alternative or modified strategies or further work; or making predictions or generalisations. The conclusions should be appropriate and supported by the available evidence

## Reviewing and Evaluating

SCQF 6

### General skill

Review and evaluate a complex problem solving activity.

### Specific skills

- ◆ Evaluate the effectiveness of the strategy/strategies
- ◆ Identify and gather appropriate evidence
- ◆ Draw conclusions and make recommendations

### Further information

Candidates will be dealing with an activity where the factors involved may be numerous, complex or unfamiliar, where relationships need to be clarified and where the task management itself is complex.

The candidate must:

- ◆ analyse the effectiveness of all aspects of a problem solving strategy — ie analysing the situation, planning and organising the task and the outcome of the activity. Evaluation should include reference to any modifications to the strategy during the course of the activity or to alternative strategies considered. Candidates may devise their own criteria for evaluation or adopt, or adapt, a set of established criteria
- ◆ identify and gather appropriate evidence to support the evaluation — sources of evidence might include use of qualitative/quantitative methods; comparisons with other systems or products; impact studies; product testing; or market research
- ◆ draw conclusions — candidates should consider all the evidence coherently with no major aspect omitted
- ◆ make recommendations — the full set of conclusions should be drawn on in making recommendations. Recommendations could include suggestions for improvements to a product, process, system, or event; the need for further evidence or in-depth investigation; use of an alternative strategy in future