



# **Arrangements for the Scottish Baccalaureate in Science**

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# Rationale for the Scottish Baccalaureate in Science

## Introduction

The Scottish Baccalaureate in Science has been designed to provide a challenging and rewarding experience for candidates in fifth and sixth year of secondary education who are able to cope with the demands of study at Higher and Advanced Higher level.

With a strong focus on skills development, including higher cognitive skills, the Scottish Baccalaureate in Science is designed to respond to the aims of *A Skills Strategy for Scotland*. A key purpose of introducing the Baccalaureates is to encourage more young people to study science Courses and to increase the number of highly qualified people in science who will help to create a more successful Scotland and contribute to Scotland's sustainable economic growth.

The Scottish Baccalaureate in Science is firmly grounded in *Science for Scotland*, the strategic framework for science published by the Scottish Government in November 2008. The Scottish Baccalaureate will provide support to our brightest scientific talent by encouraging and facilitating partnership working with a range of education and business organisations to provide project opportunities which connect the worlds of science, education and business innovation.

The Baccalaureate is based on a coherent group of subjects at Higher and Advanced Higher level. This coherence allows candidates to build a significant body of knowledge, skills and qualifications in science which will enhance progression opportunities in related disciplines to further and higher education and to employment.

In addition, the Baccalaureate offers added breadth and value through an interdisciplinary project which is intended to broaden the candidate experience, extend their subject knowledge and help to equip the candidate with the generic skills, attitudes and confidence necessary to make the transition into further and higher education and/or employment.

The project also provides a good opportunity for candidates to develop and meet the aspirations identified for every young person in *Curriculum for Excellence* (Scottish Executive 2004) that they should become successful learners, confident individuals, responsible citizens and effective contributors.

## Aims of the Scottish Baccalaureate in Science

The aims of the Scottish Baccalaureate in Science are to:

- ◆ promote sciences as a valued and important area for study and employment
- ◆ raise the status and value of S6 and motivate candidates in their last year of school
- ◆ provide qualifications which are valued for entry to higher education
- ◆ provide a bridge between school and higher education/employment
- ◆ encourage collaboration between schools and further/higher education institutions
- ◆ encourage greater coherence in study in fifth and sixth years
- ◆ allow candidates to relate and apply learning to realistic contexts
- ◆ enable candidates to compete in the international job market
- ◆ develop the generic skills needed for learning, employment and life

## The interdisciplinary project

The defining feature of the Scottish Baccalaureate in Science is the interdisciplinary project and the added value it brings to the Baccalaureate as a whole. The project will therefore be:

- ◆ motivating in its own right for candidates
- ◆ focused on generic skills which help prepare the candidate for further study/employment
- ◆ capable of extending knowledge and development of cognitive skills
- ◆ responsive to individual needs, combining breadth across science and broad themes with opportunities for greater depth of understanding within a specialist discipline
- ◆ designed to encourage the candidate to draw on many areas of learning and to recognise the interdependence of subjects in terms of skills
- ◆ designed to help prepare Scotland's young people for a globalised and interdependent world, encouraging awareness of international themes of common interest

### Key features of the interdisciplinary project

#### ◆ Application of subject knowledge in a relevant context

The project must enable candidates to:

- use their knowledge of science
- develop and apply cognitive and generic skills

Candidates will choose a context which must encourage them to apply, extend and evaluate their own skills in using this knowledge, in one or more of the broad contexts of employability, enterprise, citizenship, sustainable development or economic development.

#### ◆ Cognitive and generic skills development

The project will require candidates to show that they can effectively use the following skills:

- Application of subject knowledge and understanding
- Research skills: analysis and evaluation
- Interpersonal skills: negotiation and collaboration
- Planning: time, resource and information management
- Independent learning: autonomy and challenge in own learning
- Problem solving: critical thinking; logical and creative approaches
- Presentation skills
- Self evaluation: recognition of own skills development and future areas for development

#### ◆ Accessing different learning environments

Candidates will be encouraged to negotiate a range of contexts in which to develop and show these skills. This would add breadth to the subject learning, build on interpersonal skills and provide useful bridges between school and higher/further education or employment.

Such partnership working may include work with any or all of:

- Schools
- Workplaces
- Colleges (FE/HE)
- Universities
- Voluntary Organisations
- Community Learning and Development
- Virtual contexts

#### ◆ Candidate choice of context

Candidate choice of context will be important and should be related to areas of interest and/or to future career aspirations.

## Entry to the Scottish Baccalaureate in Science

Entry to the Scottish Baccalaureate in Science is at the discretion of the centre. However, the Baccalaureate is intended for candidates who, in fifth and sixth years of secondary education, are working at Higher and Advanced Higher level in two different, eligible Science subjects, together with Mathematics. Two of the subjects must be at Advanced Higher level.

## Structure of the Scottish Baccalaureate in Science

### Mandatory components:

The Scottish Baccalaureate in Science requires **two**, different eligible Science Courses, at least one of which must be at Advanced Higher level.

The **mandatory** components of the Scottish Baccalaureate in Science are:

|                                |                 |              |                  |
|--------------------------------|-----------------|--------------|------------------|
| Interdisciplinary Project Unit | Advanced Higher | SCQF level 7 | (16 SCQF points) |
| Two Courses                    | Advanced Higher | SCQF level 7 | (64 SCQF points) |
| One Course                     | Higher          | SCQF level 6 | (24 SCQF points) |

One of the above Courses **must** be Mathematics (Higher or Advanced Higher level) or Applied Mathematics (Advanced Higher level).

The Interdisciplinary Project Unit will be graded A, B or C.

## Criteria for award of Pass

Candidates who achieve a Pass in all mandatory components and who do not meet the criteria for Distinction will be awarded a Pass in the Scottish Baccalaureate in Science.

## Criteria for award of Distinction

The Scottish Baccalaureate in Science with Distinction will be awarded to candidates who achieve:

- ◆ Grade A in **one** Advanced Higher eligible Course
- ◆ Grade A in one other component
- ◆ Grade B or above in all other components

## Eligible Courses in the Science framework

Candidates must achieve **three** eligible Courses at the required levels, **one** of which must be:

- ◆ Mathematics (or Applied Mathematics)

Candidates **must** achieve two eligible, specialist Courses at the required levels. At least **one** of the two specialist Courses **must** be taken from the following list of Courses:

- ◆ Biology\*
- ◆ Biotechnology
- ◆ Chemistry\*
- ◆ Geology
- ◆ Human Biology
- ◆ Physics\*

**No more than one** specialist Course may be taken from the following list:

- ◆ Building Construction
- ◆ Computing\*
- ◆ Fabrication and Welding Engineering
- ◆ Graphic Communication\*
- ◆ Information Systems\*
- ◆ Managing Environmental Resources
- ◆ Mechatronics
- ◆ Product Design\*
- ◆ Technological Studies\*

\*Currently available at Advanced Higher level

SQA's Course catalogue is kept under constant review. New Courses may be added, or existing Courses may be deleted or replaced.

## Progression

Candidates who achieve a Scottish Baccalaureate in Science may progress to:

- ◆ Higher education
- ◆ Employment/training

## Assessment rationale for the Scottish Baccalaureate in Science

### 1 Courses

The assessment rationale for each of the National Courses in the Baccalaureate is clearly stated in the Course Arrangements documents for each Course. In National Courses with grades, achievement is based on achievement:

- ◆ of the Units which comprise the Course
- ◆ in the additional component(s) on which grading is based

These additional Course components are either externally assessed (often through a question paper) or internally assessed and externally verified, depending on the nature of the assessment involved and the skills/knowledge being assessed.

The added value of the additional Course components is identified clearly and might include integration of knowledge across the Units of the Course, retention of knowledge, greater emphasis on higher order skills such as analysis.

Grade Descriptions are included in the Course Arrangements.

### 2 Baccalaureate Interdisciplinary Project Unit

The purpose of the Baccalaureate Interdisciplinary Project is to add value to the candidate's Course achievements by assessing the:

- ◆ application of subject specific skills and knowledge in relevant, but less familiar contexts
- ◆ cognitive and generic skills valued by employers, higher and further education

### Assessment objectives

The Baccalaureate Interdisciplinary Project aims to assess specific cognitive and generic skills in the context of a project which the candidate will plan, implement and evaluate, in response to the given project requirements which set out the development and assessment of:

- ◆ Application of subject knowledge and understanding
- ◆ Research skills: analysis and evaluation
- ◆ Interpersonal skills: negotiation and collaboration
- ◆ Planning: time, resource and information management
- ◆ Independent learning: autonomy and challenge in own learning
- ◆ Problem solving: critical thinking; logical and creative approaches
- ◆ Presentation skills
- ◆ Self-evaluation: recognition of own skills development and future areas for development

## **Cognitive and generic skills**

The candidate will present evidence of development in and self-evaluation of the cognitive and generic skills in an area of career/personal interest in one or more of the broad contexts which could include employability, enterprise, citizenship, sustainable development, economic development.

### **Evidence**

Assessment evidence, which must cover all of the assessment objectives, will be gathered and presented in a folio for the three main stages of the project:

- ◆ Negotiating and planning an interdisciplinary project
- ◆ Carrying out and evaluating the interdisciplinary project
- ◆ Reviewing and evaluating the process of own learning

### **Project folio**

A candidate folio will contain:

- ◆ Project proposal
- ◆ Project plan
- ◆ Presentation of project findings/product
- ◆ Evaluation of project
- ◆ Self-evaluation of generic/cognitive skills development

The instrument(s) of assessment must be designed to ensure that all the assessment objectives are met. Further guidance is given in the Assessment Support Pack.

### **Grading**

The Interdisciplinary Project Unit will be graded A, B, or C. In order to pass the Unit, candidates must achieve at least a Grade C.

A Grade A or B in the Interdisciplinary Unit will count towards an award of Distinction in the Baccalaureate.

Further details and guidance on grading is given in the Unit Specification.

## Quality Assurance

The Interdisciplinary Project will be internally assessed and subject to external quality assurance by SQA.

All National Courses are subject to external marking and/or verification. External Markers, visiting Examiners and Verifiers are trained by SQA to apply national standards.

The Units of all Courses are subject to internal verification and may also be chosen for external verification. This is to ensure that national standards are being applied across all subjects.

Courses may be assessed by a variety of methods. Where marking is undertaken by a trained Marker in their own time, Markers meetings are held to ensure that a consistent standard is applied. The work of all Markers is subject to scrutiny by the Principal Assessor.

To assist centres, External Assessment Reports and Internal Assessment Reports are published on SQA's website **[www.sqa.org.uk](http://www.sqa.org.uk)**.

## **Note on appeals**

There will be no appeals for the Bacalaureate award. However, appeals for the individual Courses which comprise the award may take place in line with SQA's normal appeals process. This may affect the final Bacalaureate award.

The Interdisciplinary Project will be subject to the centres' internal verification and appeals process.

## Approaches to delivery and assessment

The Scottish Baccalaureate in Science is not intended to be a full programme of study. It is anticipated that candidates who take the Baccalaureate will also be taking other Courses in fifth and sixth year of secondary education.

Therefore, it is likely that the Courses which make up the Baccalaureate will be taken over fifth and sixth years with the Interdisciplinary Project most likely to be taken in sixth year.

While the exact time allocated to the Interdisciplinary Project Unit is at the discretion of the centre, the notional design length is 80 hours. At this level, it is expected that candidates will give an additional 80 hours of undirected time to the project.

Arrangements with other schools, colleges, community organisations, universities, on-line communities and employers are likely to provide the candidate with access to the environments, expertise and experience which will add value to the candidate's wider achievement.

The Interdisciplinary Project offers candidates a flexible approach to their learning. Study will be based on the main subject area but will also draw on knowledge and skills from a range of other disciplines. This will allow learners to make connections and links between different subjects. Candidates will be able to select from a range of contemporary contexts which may come from within and beyond the formal curriculum. They are encouraged to consider future career aspirations and personal learning needs as factors when selecting their project.

They may, for example, choose a project which extends their skills of collaboration and experience of citizenship through participation in their local community such as assisting in an education programme or social enterprise. Alternatively their choice may relate to transition to employment or further/higher education through working on challenge projects to suggest and develop solutions to current technical issues.

The Interdisciplinary Project is designed to encourage candidates to be more autonomous and self-directed in their learning which means the teacher/tutor needs to adapt their role to be more of a facilitator who guides rather than directs candidate learning. This change in roles should be discussed at the induction stage of this Unit to ensure candidates are fully aware of the nature and purpose of the Unit. Time should be spent at the outset, introducing the candidates to the importance of the cognitive and generic skills valued by employers and Higher Education. Induction should also establish timescales, responsibilities and constraints. The importance of self-motivation, autonomous learning and self-management should be stressed.

It may be useful at this stage to spend some facilitator-led time or self-directed time considering project management skills and identifying other skills areas where the candidate may wish to seek additional advice or mentoring, eg from specialist or online resources.

The Interdisciplinary Project Unit is internally assessed against clearly stated criteria for each of the five pieces of mandatory evidence detailed in the Unit specification. Assessors should adopt a holistic approach to grading based on the stated criteria in the Unit specification. It is likely, given the interdisciplinary nature of the project that more than one assessor will be involved in judging the evidence. Detailed guidance on assessment is given in the Assessment Support Pack published to support this Unit.

## **Disabled candidates and/or those with additional support needs**

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website [www.sqa.org.uk/assessmentarrangements](http://www.sqa.org.uk/assessmentarrangements)