

Scottish Group Award Specifications

SGA in:	Science		
Level:	Intermediate 2	Code:	G5AY 11

Summary of requirements

SGA in Science at Intermediate 2

National Courses and Units required*

2 National Courses (8 credits) at Intermediate 2 from:

Biology
Chemistry
Physics
Mathematics

See details in specific section

plus

8 credits at minimum of Intermediate 1

See details in open section

Total 16 credits

Core Skills required*

The above must include or cover:

5 core skills at Intermediate 1

See details in specific section

*See Important Note on page 4.

Rules for credit contribution for specific and open sections

Important Note* Achievement above the minimum requirements

The specification shows the **minimum** requirements for this SGA. Where possible, centres may wish to encourage candidates to exceed this minimum. Candidates achieving above the minimum specification will have this achievement recorded on their Scottish Qualifications Certificate. For example the following can be achieved above the minimum requirement:

- Core Skills at levels above those specified
- more National Courses and Units at Intermediate 2 instead of the credits at Intermediate 1
- National Course grades, eg grade A or B instead of grade C
- more than the required two National Courses, in which case each additional course completed counts as four credits in the open section of the specification

Hierarchies

- courses and units can be substituted by those with the same title at a higher level, eg Electricity and Electronics (Int 2) can be substituted by Electricity and Electronics (H) (See Section E)

Double counting

- courses and units with the same title at different levels cannot both contribute credits to the SGA, eg **either** Chemistry (Int 2) **or** Chemistry (H)
- courses at the same level in the same subject cannot both contribute credits to the SGA, eg **either** the National Course in Biology at Intermediate 2 **or** Standard Grade Biology at Credit Level (See Section F)
- same course with different grades cannot both contribute credits to the SGA, eg **either** Biology (Int 2) at grade A **or** Biology (Int 2) at grade C
- same course or unit cannot contribute credit to both the specific and open sections of an SGA

National Course awards at Grade D

National Course awards at Grade D can contribute to the SGA in the following ways:

- in place of the specified Intermediate 2 Course, a grade D at Higher (or above) in the Course of the same title can contribute 4 credits to the specific section
- in place of Intermediate 2 Biology, a Grade D in Higher Human Biology can contribute 4 credits to the specific section
- a grade D at Intermediate 2 (or above) can contribute 4 credits to the open section.

Note - The former compensatory course awards (fallbacks) can also contribute to the SGA:

- in place of the specified Intermediate 2 Course, a compensatory award for the Course of the same title taken at Higher (ie awarded at Intermediate 2) can contribute 4 credits to the specific section
- in place of Intermediate 2 Biology, a compensatory award for Higher Human Biology can contribute 4 credits to the specific section
- a compensatory award for a course taken at Intermediate 2 (ie awarded at Intermediate 1) can contribute 4 credits to the open section.

Specific section

A

This section specifies: mandatory courses, mandatory units, mandatory combinations of courses and/or units, mandatory core skill requirements and optional courses and units.

Course/unit no	Course/unit title	Credits
C007 11	Biology (Int 2)	4
C012 11	Chemistry (Int 2)	4
C069 11	Physics (Int 2)	4
or one National Course from the above and one from:		
C100 11	Mathematics: Maths 1,2 and 3 (Int 2)	4
C101 11	Mathematics: Maths 1,2 and Applications (Int 2)	4

Total credits required: 8

** Core skills requirement

Communication at Intermediate 1
Numeracy at Intermediate 1
Information Technology at Intermediate 1
Problem Solving at Intermediate 1
Working with Others at Intermediate 1

** See Section D for core skills details.

Note: Candidates may substitute designated Standard Grades at Credit Level for National Courses at Intermediate 2 in this section. (See Section F)

Open section

B

8 credits at minimum of Intermediate 1 are required to complete this SGA. These can be chosen from either one or both of the following sections:

- Open section (any qualification listed below)
- Specific section (units and courses not already chosen)

The 8 credits may be made up from any of the following. Each has a fixed credit value for the purposes of this SGA.

Qualifications	Credit
National Units at Intermediate 1 or above	each typically 1
National Courses at Intermediate 1 or above	each 4
Standard Grades at General Level contribute credits at <i>Intermediate 1</i> *	each 4
Standard Grades at Credit Level contribute credits at <i>Intermediate 2</i> *	each 4
Free-standing core skills units (if required to complete the core skills requirement)	each 1
Relevant SVQs at Level 2 in the following occupational areas contribute credits at <i>Intermediate 2</i> : 005 (Manufacturing) 008 (Providing Health, Social Care and Protective Services)	max 8

*If achieved prior to 1994 please contact SQA Helpdesk ☎ 0141 242 2214.

Note: There are many ways in which the 8 credits at Intermediate 1 can be achieved and the following sections are provided for your information.

Open section: Qualifications which can contribute credits to this group award.

Programme advice: Guidance on possible combinations of units and courses which candidates might choose in order to gain the required credits.

Centres and candidates should agree the most appropriate way of gaining the required credits to meet each candidate's individual needs.

Rules for credit contribution for specific and open sections

Important Note* Achievement above the minimum requirements

The specification shows the **minimum** requirements for this SGA. Where possible, centres may wish to encourage candidates to exceed this minimum. Candidates achieving above the minimum specification will have this achievement recorded on their Scottish Qualifications Certificate. For example the following can be achieved above the minimum requirement:

- Core Skills at levels above those specified
- more National Courses and Units at Intermediate 2 instead of the credits at Intermediate 1
- National Course grades, eg grade A or B instead of grade C
- more than the required two National Courses, in which case each additional course completed counts as four credits in the open section of the specification

Hierarchies

- courses and units can be substituted by those with the same title at a higher level, eg Electricity and Electronics (Int 2) can be substituted by Electricity and Electronics (H) (See Section E)

Double counting

- courses and units with the same title at different levels cannot both contribute credits to the SGA, eg **either** Chemistry (Int 2) **or** Chemistry (H)
- courses at the same level in the same subject cannot both contribute credits to the SGA, eg **either** the National Course in Biology at Intermediate 2 **or** Standard Grade Biology at Credit Level (See Section F)
- same course with different grades cannot both contribute credits to the SGA, eg **either** Biology (Int 2) at grade A **or** Biology (Int 2) at grade C
- same course or unit cannot contribute credit to both the specific and open sections of an SGA

National Course awards at Grade D

National Course awards at Grade D can contribute to the SGA in the following ways:

- in place of the specified Intermediate 2 Course, a grade D at Higher (or above) in the Course of the same title can contribute 4 credits to the specific section
- in place of Intermediate 2 Biology, a Grade D in Higher Human Biology can contribute 4 credits to the specific section
- a grade D at Intermediate 2 (or above) can contribute 4 credits to the open section.

Note - The former compensatory course awards (fallbacks) can also contribute to the SGA:

- in place of the specified Intermediate 2 Course, a compensatory award for the Course of the same title taken at Higher (ie awarded at Intermediate 2) can contribute 4 credits to the specific section
- in place of Intermediate 2 Biology, a compensatory award for Higher Human Biology can contribute 4 credits to the specific section
- a compensatory award for a course taken at Intermediate 2 (ie awarded at Intermediate 1) can contribute 4 credits to the open section.

Note: Advice on making up programmes of credit from the open section follows in Section C.

Programme advice

C

Candidates having met the requirements of the specific section need to achieve a further 8 credits at a minimum of Intermediate 1. The general rules are defined in Section B.

A wide choice is available to meet the 8 credits. Centres should consider individual candidate needs, eg for further specialist work within the title area of the SGA or for broadening beyond the SGA title area.

Advice has been developed in the following section on possible groupings of units and courses. This might be useful in the selection of programmes to meet individual candidates' career and progression needs in science. The groupings are not exhaustive. Centres and candidates can choose other provision from SQA's range of qualifications to build up a coherent programme.

Candidates can make up the 8 credits by selecting courses and/or units from a range of these groupings or by selecting courses and/or units from an individual grouping according to their needs.

Please note the rules on hierarchical substitution and double-counting listed in Section B when finalising individual candidate SGA programmes.

*Mandatory unit of a course. †Optional unit of a course. All other units are free-standing National Units.
[]Bracketed numbers indicate the former coding for these unrevised National Units.

Course/unit no	Course/unit title	Credits
Astronomy		
Free-standing National Units:		
D0R3 11	Astronomy: The Stars (Int 2) [3160007]	1
D0R4 11	Galactic Astronomy and Cosmology (Int 2) [3160017]	1
D0R5 11	Introduction to Astro-Dynamics (Int 2) [3160027]	1
D0R6 11	Introduction to Astronomical Measurement (Int 2) [3160037]	1
D0R8 11	Introduction to Astrophysics (Int 2) [3160057]	1
D0R7 10	Introduction to Astronomy (Int 1) [3160047]	1
D0R9 10	Introduction to Observing (Int 1) [3160067]	1
D0RA 10	Introduction to the History of Astronomy (Int 1) [3160077]	1
D0RB 10	The Solar System (I) (Int 1) [3160087]	1
D0RC 10	The Solar System (II) (Int 1) [3160097]	1
Biology		
Courses:		
C007 11	Biology (Int 2)	4
C007 10	Biology (Int 1)	4
Component units of courses:		
D028 11	Animal Physiology (Int 2)	1
D027 11	Environmental Biology and Genetics (Int 2)	1
D026 11	Living Cells (Int 2)	1
D024 10	Biotechnological Industries (Int 1)	1
D025 10	Growing Plants (Int 1)	1
D023 10	Health and Technology (Int 1)	1

Course/unit no	Course/unit title	Credits
Biotechnology		
Course:		
C008 11	Biotechnology (Int 2)	4
Component units of course:		
DF5G 11	Biotechnology Processes (Int 2)	1
D5F5 11	The Biology of Micro-organisms (Int 2)	1
D039 11	Working with Micro-organisms (Int 2)	1
Chemistry		
Courses:		
C012 11	Chemistry (Int 2)	4
C012 10	Chemistry (Int 1)	4
Component units of courses:		
D068 11	Acids, Bases and Metals (Int 2)	1
D066 11	Building Blocks (Int 2)	1
D067 11	Carbon Compounds (Int 2)	1
D065 10	Chemistry and Life (Int 1)	1
D063 10	Chemistry in Action (Int 1)	1
D064 10	Everyday Chemistry (Int 1)	1
Electronics		
Course:		
C025 11	Electronics and Electrical Fundamentals (Int 2)	4
Component units of course:		
D134 11	Combinational Logic (Int 2)	1
D132 11	Electrical Fundamentals (Int 2)	1
D133 11	Semiconductor Applications: An Introduction (Int 2)	1
Food Science/Technology		
Free-standing National Units:		
D0LN 11	Cheese (Int 2) [77686]	1
D0LD 11	Chilling and Freezing of Foods (Int 2) [77533]	1
D0L9 11	Conversion and Separation Operations (Int 2) [77515]	1.5
D0RN 12	Craft Baking: Fermentation and Conditioning Technology (H) [3230213]	2
D0LM 11	Cream and Butter (Int 2) [77685]	1
D0L5 11	Food Additives (Int 2) [77430]	0.5
D0LA 11	Food Fermentation (Int 2) [77526]	0.5
EF4D 12	Food Safety for Food Handlers (H) [5130406]	0.5
D0L6 11	Food Spoilage (Int 2) [77440]	1
D0LB 11	Heat Conversion Operations: Food (Int 2) [77531]	0.5
D0LF 11	Milk Production, Processing and Handling (Int 2) [77680]	1
D11K 12	Nutrition and Health (Int 2) [7150540]	1
D0RJ 11	Packaging of Foods (Int 2) [3210360]	1

Course/unit no	Course/unit title	Credits
Free-standing National Units continued:		
D0LC 11	Pasteurisation and Sterilisation (Int 2) [77532]	1
D0JH 11	Process Plant Hygiene (Int 2) [67125]	0.5
D0R0 11	Quality Assurance (Int 2) [2280066]	1
D0RL 10	Food Hygiene Practices (Int 1) [3211007]	0.5
D0N8 10	Introduction to Chilling and Freezing of Foods (Int 1) [97534]	0.5
D0L4 10	Introduction to Food Manufacture (Int 1) [77401]	1
D0RH 10	Introduction to Packaging of Foods (Int 1) [3210350]	0.5
D0L8 10	Preliminary Operations: Food Processing (Int 1) [77510]	0.5
D0KL 11	Techniques in Food Microbiology (Int 2) [69200]	2
D0LP 11	Yoghurt, Ice Cream and Dairy Desserts (Int 2) [77687]	1

Geography

Courses:

C208 11	Geography (Int 2)	4
C208 10	Geography (Int 1)	4

Component units of course:

DF3C 11	Geography: Physical Environment (Int 2)	1
DF43 11	Geography: Human Environment (Int 2)	1
DF44 11	Geography: Environmental Interactions (Int 2)	1
DF3C 10	Geography: Physical Environment (Int 1)	1
DF43 10	Geography: Human Environment (Int 1)	1
DF44 10	Geography: Environmental Interactions (Int 1)	1

Geology

Courses:

C043 11	Geology (Int 2)	4
C043 10	Geology (Int 1)	4

Component units of courses:

D247 11	Earth Physics and Earth Movements (Int 2)	1
D244 10	Geology and Scenery (Int 1)	1
D245 10	Geology, People and Environment (Int 1)	1
D8XL 11	History of the Earth (Int 2)	1
D8XK 11	Minerals and Rocks (Int 2)	1
D243 10	The Study of the Earth (Int 1)	1

Course/unit no	Course/unit title	Credits
Managing Environmental Resources		
Courses:		
C055 11	Managing Environmental Resources (Int 2)	4
C055 10	Managing Environmental Resources (Int 1)	4
Component units of courses:		
D313 11	Ecological Principles and Investigations (Int 2)	1
D310 10	Ecosystems: An Introduction (Int 1)	1
D309 10	Environmental Issues: An Introduction (Int 1)	1
D311 10	Land Use: An Introduction (Int 1)	1
D314 11	Local Environment (Int 2)	1
D312 11	Natural Resource Use (Int 2)	1
Mathematics		
Courses:		
C100 11	Mathematics: Maths 1, 2 and 3 (Int 2)	4
C100 10	Mathematics: Maths 1, 2 and 3 (Int 1)	4
C101 11	Mathematics: Maths 1, 2 and Applications (Int 2)	4
C101 10	Mathematics: Maths 1, 2 and Applications (Int 1)	4
Component units of courses:		
D321 11	Mathematics 1 (Int 2)	1
D322 11	Mathematics 2 (Int 2)	1
D323 11	Mathematics 3 (Int 2)	
D324 11	Applications of Mathematics (Int 2)	1
D321 10	Mathematics 1 (Int 1)	1
D322 10	Mathematics 2 (Int 1)	1
D323 10	Mathematics 3 (Int 1)	
D324 10	Applications of Mathematics (Int 1)	1
Physics		
Courses:		
C069 11	Physics (Int 2)	4
C069 10	Physics (Int 1)	4
Component units of courses:		
D380 11	Electricity and Electronics (Int 2)	1
D379 11	Mechanics and Heat (Int 2)	1
D382 11	Radioactivity (Int 2)	0.5
D381 11	Waves and Optics (Int 2)	0.5
D378 10	Electronics (Int 1)	0.5
D377 10	Movement (Int 1)	0.5
D374 10	Practical Electricity (Int 1)	0.5
D375 10	Radiations (Int 1)	0.5
D376 10	Sound and Music (Int 1)	0.5
D373 10	Telecommunications (Int 1)	0.5

Course/unit no	Course/unit title	Credits
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Science Practical Skills

Free-standing National Units:

D940 11	Science in Context 2 (Int 2)	1
D941 11	Science Investigation Skills (Int 2)	0.5
D942 10	Science Practical Skills (Int 1)	0.5

Technological Studies

Course:

C036 11	Technological Studies (Int 2)	4
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Component units of courses:

D186 11	Applied Electronics (Int 2)	1
D185 11	Energy (Int 2)	0.5
D188 11	Mechanical Systems (Int 2)	1
D187 11	Systems and Control (Int 2)	0.5

Work Experience

Free-standing National Unit:

D36H 11	Work Experience (Int 2)	1
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Core Skills

Free-standing National Units:

D01B 10	Communication (Int 1)	1
D01D 10	Information Technology (Int 1)	1
D01C 10	Numeracy (Int 1)	1
D01E 10	Problem Solving (Int 1)	1
D01F 10	Working with Others (Int 1)	1

Candidates who have not achieved these core skills in other ways must select the required core skills units. See Section D for further information.

One or more core skills in this SGA may be automatically certificated through courses and units in the specific section. Where this is the case, the corresponding core skill unit in the open section cannot be counted towards the SGA.

Core skills

D

To achieve this SGA, all candidates **must achieve** the following core skills:

Core skill	Level
Communication	Intermediate 1
Numeracy	Intermediate 1
Information Technology	Intermediate 1
Problem Solving	Intermediate 1
Working with Others	Intermediate 1

Candidates can achieve core skills:

- through Standard Grades or other units which give automatic certification of core skills, eg a candidate who has completed Standard Grade English and Mathematics at General Level is given automatic certification of Communication and Numeracy at Intermediate 1
- by selecting from the group award units and courses which give automatic certification of core skills, eg the Intermediate 2 course in Mathematics gives automatic certification of Numeracy at Intermediate 2
- by selecting dedicated core skills units in the open section of the SGA

Candidates' current level of achievement in core skills is shown on the Scottish Qualifications Certificate in the form of a profile. This shows achievement against each of the core skills *components*. Where a core skill has more than one component, the candidate needs to achieve each component at the level specified for the SGA. For example, if an SGA requires Problem Solving at Intermediate 1, a candidate whose profile shows Critical Thinking and Planning and Organising at Intermediate 1 and Reviewing and Evaluating at Access 3 would not meet the requirement and would have to improve in Reviewing and Evaluating.

Details of all courses which give automatic certification of core skills is published in the *Catalogue of Core Skills in National Qualifications* (SQA, 2001/2002).

Hierarchical sequences

E

The SQA numbering system for qualifications consists of a 4 + 2 reference code.

The qualifications in a hierarchical sequence have the same title and are available at more than one level. They are identified by their reference code having the same first four digits, eg, D01D in the example below. The last two digits are unique to each level of qualification, eg 12 equates to Higher, 11 equates to Intermediate 2.

Units

The following is an example of a hierarchical sequence of units:

D01D 10	Information Technology (Int 1)
D01D 11	Information Technology (Int 2)
D01D 12	Information Technology (H)

Where units which are part of hierarchical sequences are specified, candidates who achieve a unit at a higher level than the one specified can use the upper level unit to count as credit towards the group award. For example, Information Technology (H) can be counted instead of Information Technology (Int 2).

Candidates can only use one of these units to count as credit towards the group award.

In the case of unrevised National Certificate Modules, ie units which retain their original number, there are hierarchies where the title is the same and the number is different. Details of these exceptions will be published in a separate document. The pattern for these hierarchies is the same as that previously established for GSVQs.

There are also some hierarchies where the titles and numbers of the units at different levels are different. In this specification, if there are two units at different levels with heavily overlapping content, only one of these units should be used to count as credit towards the group award. Details of these exceptions will be published in a separate document.

Courses

The following is an example of a hierarchical sequence of courses:

C007 10	Biology (Int 1)
C007 11	Biology (Int 2)
C007 12	Biology (H)
C007 13	Biology (AH)

In the SGA specification, where courses which belong to hierarchical sequences are specified, candidates who achieve a course at a higher level than the one specified can use the upper level course to count as credit towards the group award. For example, Biology (H) can be counted instead of Biology (Int 2).

Candidates can only use one of these courses to count as credit towards the group award - a maximum of 4 credits.

Standard Grades

F

Designated Standard Grades at Credit Level can contribute 4 credits each to the SGA in place of corresponding National Courses in the *specific section*.

The designated Standard Grades and their corresponding National Courses, either of which can contribute to this SGA, are as follows:

Standard Grade

Biology at Credit Level
Chemistry at Credit Level
Mathematics at Credit Level
Physics at Credit Level

National Course

Biology (Int 2)
Chemistry (Int 2)
Mathematics (Int 2)
Physics (Int 2)

Note: Any Standard Grade at General or Credit Level can contribute 4 credits to the *open section*.

SVQs

G

Relevant Scottish Vocational Qualifications (SVQs) from occupational areas 005 (Manufacturing) and 008 (Providing Health, Social Care and Protective Services) can each contribute up to eight credits to the open section of the SGA.

SVQs at Level 2 contribute credits at Intermediate 2.

SVQs at Level 1 contribute credits at Intermediate 1.

The following are **examples** of relevant SVQs.

Code no	Relevant SVQs	Level
005 Manufacturing		
G61B 22	Laboratory Technician: Working in Education	2
008 Providing Health, Social Care and Protective Services		
G3H3 22	Optical Support Services	2

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