

National Unit Specification: general information

UNIT	Earth Physics and Earth Movements (Intermediate 2)
NUMBER	D247 11
COURSE	Geology (Intermediate 2)

SUMMARY

This unit seeks to allow candidates to acquire a detailed knowledge of what earthquakes tell us about the interior of the Earth; the causes and effects of isostatic movements; the movement of continents and the opening of oceans; and geological maps and block models. Skills of problem solving will be greatly enhanced. Practical work will develop skills of observation, interpretation, recording and communication. The study of rocks in the field will foster positive attitudes towards caring for the environment.

OUTCOMES

- 1 Demonstrate knowledge and understanding related to Earth physics and Earth movements.
- 2 Solve problems related to Earth physics and Earth movements.
- 3 Collect and analyse information related to Earth physics and Earth movements obtained through practical work.

RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates would normally be expected to have attained the Intermediate 1 Geology course or its component units. It would, however, be possible for able candidates to enter the course with no prior knowledge of geology. Previous experience of a science or Geography at Intermediate 1 or Intermediate 2 or equivalent would be advantageous.

Administrative Information

Superclass:	RF
Publication date:	July 2002
Source:	Scottish Qualifications Authority
Version:	04

© Scottish Qualifications Authority 2002

This publication may be reproduced in whole or in part for educational purposes provided that no profit is derived from reproduction and that, if reproduced in part, the source is acknowledged.

Additional copies of this unit specification can be purchased from the Scottish Qualifications Authority. The cost for each unit specification is £2.50 (minimum order £5).

National Unit Specification: general information (cont)

UNIT Earth Physics and Earth Movements (Intermediate 2)

CREDIT VALUE

1 credit at Intermediate 2.

CORE SKILLS

This unit gives automatic certification of the following:

Complete core skills for the unit	Problem Solving	Intermediate 2
Additional core skills components for the unit	Using Graphical Information	Intermediate 2

Additional information about core skills is published in the *Catalogue of Core Skills in National Qualifications* (SQA, 2001).

National Unit Specification: statement of standards

UNIT Earth Physics and Earth Movements (Intermediate 2)

Acceptable performance in this unit will be the satisfactory achievement of the standards set out in this part of the unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to the Scottish Qualifications Authority.

OUTCOME 1

Demonstrate knowledge and understanding related to Earth physics and Earth movements.

Performance criteria

- (a) The properties of earthquakes and earthquake waves are correctly described.
- (b) The internal structure of the Earth is correctly described.
- (c) The origin and effects of isostatic movements are correctly described.
- (d) Geological structures are correctly identified.
- (e) The effects of large-scale Earth movements are correctly described.

Evidence requirements

Evidence is produced from a closed book test which demonstrates successful achievement of all of the above performance criteria.

OUTCOME 2

Solve problems related to Earth physics and Earth movements.

Performance criteria

- (a) Relevant information is selected and presented in an appropriate format.
- (b) Information is accurately processed using calculations where appropriate.
- (c) Valid conclusions are drawn and explanations given are supported by evidence.
- (d) Predictions and generalisations are made based on the available evidence.
- (e) The sequence of formation of geological structures is correctly established from cross-cutting and superposed relationships.
- (f) Movement directions on faults are correctly established.

Evidence requirements

Evidence is produced from a closed book test which demonstrates successful achievement of all of the above performance criteria, including the interpretation and communication of graphical information at an appropriate level. With reference to PCs (c) and (d), the candidate's answers must include valid conclusions and explanations based on an evaluation of the supporting evidence.

National Unit Specification: statement of standards (cont)

UNIT Earth Physics and Earth Movements (Intermediate 2)

OUTCOME 3

Collect and analyse information related to Earth physics and Earth movements obtained through practical work.

Performance criteria

- (a) Geological structures in the field are correctly described with respect to their modes of formation and effects.
- (b) The cross-cutting and superposed relationships of rocks and structures in the field are correctly established.
- (c) Fieldwork is planned, organised, conducted and reviewed effectively.

Evidence requirements

Candidates should submit a fieldwork report of about 400 words, illustrated by apposite forms of graphical information, reflecting on observation, recording, identification and interpretation undertaken. The nature of the field area will determine which rock properties, structures and relationships are described.

The teacher/lecturer responsible must attest that the report is the individual work of the candidate derived from active participation in the fieldwork. This includes setting objectives for the fieldwork, planning of appropriate tasks, identifying and obtaining the necessary resources, carrying out the fieldwork and evaluating all stages. Conclusions and recommendations should be justified by reference to evidence drawn from the fieldwork.

National Unit Specification: support notes

UNIT Earth Physics and Earth Movements (Intermediate 2)

This part of the unit specification is offered as guidance. The support notes are not mandatory.

While the time allocated to this unit is at the discretion of the centre, the notional design length is 40 hours.

Guidance on the content and context for this unit, and on learning and teaching approaches, is given in the table in the Content section of the course details.

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

Outcomes 1 and 2 will be assessed by means of an integrated end-of-unit assessment. The end-of-unit assessment has no specified mark allocation. However, the following approximate percentage mark allocations are recommended. (Note that the numbers given express a ratio of marks allocated. Candidates would not be expected to undertake test items with the actual mark allocations shown.)

Outcome 1	(knowledge and understanding)	60%
PC:		
(a)	Earthquakes and earthquake waves.	(12)
(b)	Internal structure of the Earth.	(12)
(c)	Isostatic movements.	(8)
(d)	Geological structures.	(6)
(e)	Large-scale Earth movements.	(22)
Outcome 2	(problem solving)	40%
PC		
(a)	Selecting and presenting information.	(4)
(b)	Processing information.	(6)
(c)	Drawing conclusions and giving explanations.	(10)
(d)	Making predictions and generalisations.	(4)
(e)	The sequence of formation of geological structures.	(10)
(f)	Movement directions on faults.	(6)

Test items should be constructed to allow candidates to generate evidence relating to the performance criteria as follows:

- (a) Selecting, presenting and processing information
 - Sources of information include text; tables, diagrams, charts and graphs; numerical information.
 - Formats of presentation include written responses; tables, diagrams, charts and graphs.
- (b) Calculations include averages, ratios and percentages.
- (c) From information given, candidates should be able to draw conclusions with explanations supported by using relevant evidence and developing an appropriate approach.
- (d) From given situations, candidates should be able to make predictions and generalisations eg by knowing when it is and when it is not possible to predict that the Earth's magnetic field is normal or reversed.

National Unit Specification: support notes (cont)

UNIT Earth Physics and Earth Movements (Intermediate 2)

- (e) From information given, usually in graphical form, candidates should be able to determine the sequence of the formation of various geological structures.
- (f) From information given, usually in graphical form, candidates should be able to establish movement directions on faults.

Outcome 3

Collect and analyse information related to Earth physics and Earth movements obtained through practical work.

PC

- (a) Geological structures are correctly described with respect to their modes of formation and effects.
- (b) The cross-cutting and superposed relationships of rocks and structures are correctly established.
- (c) Fieldwork is planned, organised, conducted and reviewed effectively.

The candidate should produce a fieldwork report of about 400 words, illustrated by apposite maps diagrams, photographs and other forms of graphical information and reflecting on observation, recording, identification and interpretation undertaken. If it is not possible to make fieldwork visits, the account should be based on simulated fieldwork that involves the candidate in all of the stages and decisions of a visit. In all cases the following aspects of assessment of fieldwork reports apply:

1. Gathering of Information (Total 10 marks)

- *Planning and organisation of work (2 marks)*
Planning of the tasks and necessary resources should be appropriate to the objectives of the fieldwork eg
 - prior research such as obtaining and studying relevant maps
 - collection of necessary resources such as maps, safety and measuring equipment, recording equipment (clipboard, papers, pencils, camera etc.)In the field, the candidate should be able to amend or extend the original plan of approach, eg by returning to areas previously visited in the light of later observations.
- *Observation (5 marks)*
Marks in this category are awarded for skills shown by the candidate in making disciplined accurate observations of whatever is under investigation. The mark awarded may be drawn partly from follow-up laboratory work carried out by the candidate.
- *Recording (3 marks)*
Marks awarded should be based on the ability of the candidate to record, in an appropriate and complete form, observation, measurements, calculations and interpretations drawn from fieldwork and any further practical work.

National Unit Specification: support notes (cont)

UNIT Earth Physics and Earth Movements (Intermediate 2)

2. Processing Information (Total 10 marks)

- *Identification (4 marks)*
There should be evidence of recognition of specific features and of their description to an appropriate degree of detail. Marks should be awarded for the quantity of identification from the possible range of features and for the quality of the description given.
- *Overall content (4 marks)*
The mark should take account of the quality of the geological content of the report and the degree to which relevant illustrations such as maps, diagrams, photographs and graphs are integrated into the report.
- *Presentation of report (2 marks)*
The report is of a scientific investigation and its structure and accessibility to the reader should reflect this. At all levels the report should have:
 - a title
 - a specification of the locality of the area or areas studied
 - illustrations eg maps, diagrams, photographs, graphs
 - an account of observations, measurements and interpretations.At Intermediate 2, there should be suggestions for amending the approach, for improving the methods or for further work.

3. Interpretation (Total 10 marks)

- *Interpretation (10 marks)*
Under this heading the assessor should consider the quality of the interpretations made, and the extent to which interpretations are justified.
At Intermediate 2 candidates should be able to justify their explanation from evidence gathered but should also show an awareness of the methods used and of their own capabilities and make suggestions for improvement.

The field study for this unit is the only fieldwork required at Intermediate 2, and the mark for fieldwork contributes to the final external mark. The fieldwork report may also afford the candidate opportunities to demonstrate achievement beyond that required to attain the unit outcomes.

SPECIAL NEEDS

This unit specification is intended to ensure that there are no artificial barriers to learning or assessment. Special needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering alternative outcomes for units. For information on these, please refer to the SQA document *Guidance on Special Assessment Arrangements* (SQA, 2001).