Course Support Notes

National 4 Environmental Science Course Support Notes

Please refer to the note of changes at the end of this document for details of changes from previous version (where applicable).

Contents

Introduction

These support notes provide advice and guidance on approaches to delivering and assessing the National 4 Environmental Science Course. They are intended for teachers and lecturers who are delivering the Course and its Units. They should be read in conjunction with the *Course Specification*, the *Added Value Unit Specification*, and the *Unit Specifications* for the Units in the Course.

General guidance on the Course

Aims

As stated in the Course Specification, the aims of the Course are to enable learners to:

- develop and apply knowledge and understanding of environmental science
- develop an understanding of environmental science's role in scientific issues and relevant applications of environmental science in society and the environment
- develop scientific inquiry and investigative skills
- develop scientific analytical thinking skills in an environmental science context
- develop the use of technology, equipment and materials, safely, in practical scientific activities
- develop problem solving skills in an environmental science context
- develop practical fieldwork skills in an environmental science context
- use and understand scientific literacy, in everyday contexts, to communicate ideas and issues
- develop the knowledge and skills for more advanced learning in environmental science

Progression into this Course

Entry to this Course is at the discretion of the centre. However, learners would normally be expected to have attained the skills and knowledge required by one or more of the following or by equivalent qualifications and/or experience:

- National 3 Environmental Science Course

There may also be progression from National 3 Biology, National 3 Chemistry, National 3 Geography, National 3 Physics or National 3 Science Courses.

Experiences and outcomes

National Courses have been designed to draw on and build on the curriculum experiences and outcomes as appropriate. Qualifications developed for the senior phase of secondary education are benchmarked against SCQF levels. SCQF level 4 and the curriculum level 4 are broadly equivalent in terms of level of demand although qualifications at SCQF level 4 will be more specific to allow for more specialist study of subjects.

Learners who have completed Curriculum for Excellence experiences and outcomes will find these an appropriate basis for doing the Course. In this Course, learners would benefit from having experience of the following:

Organisers	**Lines of development**	
Planet Earth	Biodiversity and Interdependence	SCN 01, 02, 03
	Energy Sources and Sustainability	SCN 04
	Processes of the Planet	SCN 05
Materials	Earth's Materials	SCN 17
	Chemical Changes	SCN 18
People, Place and the Environment		SOC 8, 9, 10

More detail is contained in the Environmental Science Progression Framework. The Environmental Science Progression Framework shows the development of the key areas throughout the suite of Courses,

Skills, knowledge and understanding covered in the Course

Note: teachers and lecturers should refer to the *Added Value Unit Specification* for mandatory information about the skills, knowledge and understanding to be covered in this Course.

Progression from this Course

This Course or its components may provide progression for the learner to:

- National 5 Environmental Science Course
- National 4 or 5 Course in another science subject
- Skills for Work Courses (SCQF levels 4 or 5)
- National Certificate Group Awards
- National Progression Awards (SCQF levels 4 or 5)
- Employment and/or training

Hierarchies

Hierarchy is the term used to describe Courses and Units which form a structured sequence involving two or more SCQF levels.

It is important that any content in a Course and/or Unit at one particular SCQF level is not repeated if a learner progresses to the next level of the hierarchy. The skills and knowledge should be able to be applied to new content and contexts to enrich the learning experience. This is for centres to manage.

- Environmental Science Courses from National 3 to Higher are hierarchical.
- Courses from National 3 to Higher have Units with the same structure and titles.

Approaches to learning and teaching

The purpose of this section is to provide you with advice and guidance on learning and teaching. It is essential that you are familiar with the mandatory information within the Environmental Science *Added Value Unit Specification*.

Teaching should involve an appropriate range of approaches to develop knowledge and understanding and skills for learning, life and work. This can be integrated into a related sequence of activities, centred on an idea, theme or application of environmental science, based on appropriate contexts, and need not be restricted to the Unit structure. Learning should be experiential, active, challenging and enjoyable, and include appropriate practical experiments/activities and could be learner-led. The use of a variety of active learning approaches is encouraged, including peer teaching and assessment, individual and group presentations, role-playing and game-based learning, with learner- generated questions.

When developing your Environmental Science Course there should be opportunities for learners to take responsibility for their learning. Learning and teaching should build on learners' prior knowledge, skills and experiences. The Units and the key areas identified within them may be approached in any appropriate sequence, at the centre's discretion. The distribution of time between the various Units is a matter for professional judgement and is entirely at the discretion the centre. Each Unit is likely to require an approximately equal time allocation, although this may depend on the learners' prior learning in the different key areas.

Learning and teaching, within a class, can be organised, in a flexible way, to allow a range of learners' needs to be met, including learners achieving at different levels. The hierarchical nature of the new Environmental Science qualifications provides improved continuity between the levels. Centres can, therefore, organise learning and teaching strategies in ways appropriate for their learners.

Within a class, there may be learners capable of achieving at a higher level in some aspects of the Course. Where possible, they should be given the opportunity to do so. There may also be learners who are struggling to achieve in all aspects of the Course, and may only achieve at the lower level in some areas.

Teachers/lecturers need to consider the Course and Unit Specifications, to identify the differences between Course levels. It may also be useful to refer to the Environmental Science Progression Framework.

When delivering this Course to a group of learners, with some working towards different levels, it may be useful for teachers to identify activities covering common concepts and skills for all learners, and additional activities required for some learners. In some aspects of the Course, the difference between levels is defined in terms of a higher level of skill.

An investigatory approach is encouraged in Environmental Science, with learners actively involved in developing their skills, knowledge and understanding by investigating a range of relevant Environmental Science applications and issues.

A holistic approach should be adopted to encourage simultaneous development of learners' conceptual understanding and skills.

Where appropriate, investigative work/experiments, in Environmental Science, should allow learners the opportunity to select activities and/or carry out extended study. Investigative and experimental work is part of the scientific method of working and can fulfil a number of educational purposes.

All learning and teaching should offer opportunities for learners to work collaboratively. Practical activities and investigative work can offer opportunities for group work, which should be encouraged.

Group work approaches can be used within Units and across Courses, where it is helpful to simulate real-life situations, share tasks and promote team working skills. However, there must be clear evidence for each learner to show that the learner has met the required assessment standards for the Unit or Course.

Laboratory work should include the use of technology and equipment that reflects current scientific use in Environmental Science. Fieldwork provides an opportunity for practical work, using first-hand experience of an ecosystem to develop knowledge, understanding and problem solving. Appropriate risk assessment must be undertaken.

Learners would be expected to contribute their own time, in addition to programmed learning time.

Effective partnership working can enhance the science experience. Where possible, locally relevant contexts should be studied, with visits where this is possible. Guest speakers from, for example, industry, further and higher education could be used to bring the world of environmental science into the classroom.

Information and Communications Technology (ICT) can make a significant contribution to practical work in Higher Environmental Science, in addition to the use of computers as a learning tool. Computer interfacing equipment can detect and record small changes in variables allowing experimental results to be recorded over short periods of time completing experiments in class time. Results can also be displayed in real time helping to improve understanding. Data logging equipment and video cameras can be set up to record data and make observations, over periods of time longer than a class lesson, which can then be subsequently downloaded and viewed for analysis.

Learning about Scotland and Scottish culture will enrich the learners' learning experience and help them to develop the skills for learning, life and work they will need to prepare them for taking their place in a diverse, inclusive and participative Scotland and beyond. Where there are opportunities to contextualise approaches to learning and teaching to Scottish contexts, teachers and lecturers should consider this.

Assessment should be integral to and improve learning and teaching. The approach should involve learners and provide supportive feedback. Self- and peer-assessment techniques should be encouraged, wherever appropriate. Assessment information should be used to set learning targets and next steps.

As part of learning, teaching and preparation for assessment, it is recommended that learners carry out several investigations that meet the requirements of the Assignment, as stipulated in the Added Value Unit Specification. This should help learners develop the necessary skills and prepare them for subsequent assessment.

For exemplification, a resource pack for one investigation is contained in Appendix 2. This resource pack contains background information on one topic, as well as links and suggestions of other sources of information. It exemplifies one approach to Stage 1 (research stage) of the investigation.

Learners may practise producing their report/communication, using this resource pack as their source of information/data for Stage 1 (research stage) of the investigation. This will allow Stage 2 (communicating stage) to be carried out without learners having to access additional resources.

The *Course and Unit Support Notes* for National 5 Environmental Science, National 4 Biology and National 5 Biology each contain a resource pack for a different topic. Some of these may also provide learners with suitable opportunities to practise their Assignment.

Teachers and lecturers may choose to develop other resource packs, on an on-going basis, to provide sets of resources for learners.

Suggestions for possible contexts and learning activities to support and enrich learning and teaching are detailed in the table below. The **key areas** are from the **Added Value Unit Specification**. **Suggested learning activities** are not mandatory. This offers examples of suggested activities, from which you could select a range. It is not expected that all will be covered. The contexts for key areas are open to personalisation and choice, so centres are likely to devise their own learning activities. **Exemplification of key areas** is not mandatory. It provides an outline of the level of demand and detail of the key areas.

Living Environment		
Key areas	**Suggested learning activities**	**Exemplification of key areas**
1 Interdependence	Tour of local area using ranger services etc. Invited speakers from local organisations. Photo activity/presentation of local ecosystems, habitats and communities.	This could cover feeding relationships, factors affecting ecosystems.
	Collect organisms using pitfall traps, nets and tree beating. Construct a wormery. Set up an aquarium to show interaction of plants, animals and non-living parts of the ecosystem.	This could include methods of sampling/measuring organisms and their environment.
	Construct food chains and food webs from studies of an ecosystem/food chain/web card exercise. Practical activities (eg role play/hats activity) to construct food webs. Research examples of herbivores, carnivores, omnivores and decomposers and design	

	posters illustrating food webs. Card game activities to support definitions. Investigate a range of ecosystems eg tree, pond, leaf litter, to identify the producers and consumers. Measure temperature, light intensity, soil pH and water content of soil in a selected local ecosystem. Repeat measurements to obtain averages. Problem solving exercise drawing conclusion from results. Problem solving activity (eg keys) using suitable sources/books. Mind-map exercise compiling species lists for school grounds/local area. Results displayed as posters.	
2 Adaptation for survival	Investigate plant and animal species from different ecosystems.	
3 Impact of population growth and natural hazards on biodiversity	Investigate population changes (eg humans, other species) and construct/interpret graphs/tables. Research impact of human-generated (eg acid rain, climate changes, over-fishing, deforestation) and natural (eg drought, flooding, tsunami, harsh winters, volcanic	

	eruption) hazards on biodiversity. Analyse investigation reports, produce presentations on the effects. Investigate any biodiversity problem. Examples could include red deer, rhododendron, Japanese knotweed, grey squirrel culling.	
4 Nitrogen cycle.	Investigate the nitrogen cycle eg complete simple diagram, role play, poster, presentation.	Basic level eg names of bacteria or processes not required.
5 Environmental impact of fertilisers.	Investigate the positive and negative impacts of fertilisers eg produce report/presentation.	

Earth's Resources		
Key areas	**Suggested learning activities**	**Exemplification of key areas**
1 Responsible use and conservation of non-renewable and renewable resources.	Investigate physical, biological, non-renewable and renewable resources and the differences between them. Investigate the responsible use of non-renewable and renewable resources. Investigate the conservation of non-renewable and renewable resources.	
2 Formation and use of fossil fuels.	Investigate the formation and use of fossil fuels eg coal, oil, gas. Visit heritage museum eg coal mining/oil shale museum. Investigate the advantages and disadvantages of using fossil fuels to generate electricity.	
3 Derivation and uses of materials derived from crude oil.	Research production and use of materials made from crude oil. BP could be source of good resources. Visit/ build model of oil refinery.	Uses include fuel (eg natural gas, petrol, diesel, fuel oil, paraffin/kerosene, LPG) for transport, heating, generating electricity, industrial processes, lubricants, bitumen, solvents, waxes, detergents, plastics, rubbers, fibres.
4 Risks and benefits of different energy sources, including those produced from plants.	Research several different types of energy sources including biofuels. Visit eg nuclear power station, hydro producer, wind farm,	

	biofuel power station, and other relevant/local examples. Investigate/debate the risks and benefits of different energy sources.	
	Websites: Buzzle Ecofriendlykids Science3–18 Livestrong enotes ehow United Nations Environment Programme Waves of the future The Earth Charter Initiative Bulletin of the Atomic Scientists International Atomic Energy Agency The Union of Concerned Scientists Royal Society World Nuclear Association Time for Change upd8 Berkshire Litchfield Environmental Council Want to know it Friends of the Earth (Scotland) Alternative Energy John Muir Trust	

5	The carbon cycle.	Investigate the effects of burning fossil fuels on the concentration of carbon dioxide in the atmosphere.	The cycle could be covered at a basic level eg to include photosynthesis, respiration and combustion, formation of fossil fuels.
6	Processes involved in maintaining the balance of gases in the air.	Investigate the natural greenhouse effect.	
7	Causes and implications of changes in the balance.	Investigate the enhanced greenhouse effect and possible impacts.	
		Websites: NASA Parliament of Australia DEFRA People and Planet BBC National Oceanic and Atmospheric Administration University of California, San Diego	

Sustainability		
Key areas	**Suggested learning activities**	**Exemplification of key areas**
1 Sustainability of key natural resources and possible implications for human activity. 2 The interaction between humans and the environment and the impact of human activity on an area.	Investigate definitions of sustainable development and sustainability (social, economic and environmental) and global citizenship. Investigate global citizenship by identifying personal qualities of global citizens. Investigate sustainability of key natural resources (eg food supply, water, energy supply) and possible implications for human activity. Compare water supplies between developed and developing countries and access to clean water supplies. Investigate local water use eg where drinking supplies come from and disposal. Investigate/audit sustainable approaches in personal water use. Investigate sustainable approaches in waste management: 'reduce, reuse, and recycle'. Website — Zero Waste Scotland. Investigate/visit local waste management eg contact local authority waste, recycling or litter departments.	

	Investigate waste streams eg textiles, glass, aluminium cans, paper, food waste, plastics. Investigate local issues eg litter, fly-tipping, dog fouling, beach pollution. Investigate waste disposal eg landfill sites, industrial pollution. Calculate personal carbon footprint. Compile a personal sustainability plan (PSP). A methodology is described on WWF (Linking Thinking) website. Investigate sustainable approaches in reducing greenhouse gas emissions eg green technologies such as wind power, hydro, insulation, solar panels. Investigate the role of NGOs such as Oxfam, Friends of the Earth and WWF.	
	Websites: OXFAM Cool Planet Education Scotland STEM Central — Sustainable water supply Scottish Water Education Site WaterAid Learn Zone	
3 The role of agriculture in the production of food and raw material and its environmental impacts and sustainability	Investigate the positive and negative environmental impacts of various approaches in agriculture.	This could include food security, habitat removal, loss of biodiversity, animal welfare, use of artificial fertilisers and pesticides, food miles, farm stewardship schemes, organic

	Carry out an audit of personal food consumption. Research food labelling information. Visit agricultural shows. Visiting speakers from, eg supermarkets, farms. Websites: Soil Association Royal Highland Education Trust	farming, local and in-season produce.
4 Society's energy needs.	Investigate energy use, increased demand and its impact. Contact Local Authority Energy Officer. Visit renewable demonstration projects Investigate initiatives to reduce energy consumption such as Eco Schools, WWF Earth Hour. Investigate how to reduce personal energy use eg low energy light bulbs, insulating buildings, switching off equipment when not in use, walking to destinations.	
5 Impact of developments in transport infrastructure in a selected area and development of sustainable systems.	Investigate transport infrastructure issues eg road congestion, pollution, road/bridge construction, airport developments, rail development, rural public transport reduction. Investigate sustainable approaches eg public transport, park and ride, bus lanes.	

	Websites which can provide a range of resources for this Unit: STEM Central Schools Global Footprint Calculator — Education Scotland Ellen MacArthur Foundation (cradle to cradle sustainability)	

Developing skills for learning, skills for life and skills for work

Learners are expected to develop broad generic skills as an integral part of their learning experience. The *Course Specification* lists the skills for learning, skills for life and skills for work that learners should develop through this Course. These are based on SQA's *Skills Framework: Skills for Learning, Skills for Life and Skills for Work* and must be built into the Course where there are appropriate opportunities. The level of these skills will be appropriate to the level of the Course.

For this Course, it is expected that the following skills for learning, skills for life and skills for work will be significantly developed:

Numeracy
This is the ability to use numbers in order to solve problems by counting, doing calculations, measuring, and understanding graphs and charts. This is also the ability to understand the results. Learners will have opportunities to extract, process and interpret information presented in numerous formats including tabular and graphical. Practical work will provide opportunities to develop time and measurement skills.

2.1 Number processes
Number processes means solving problems arising in everyday life through carrying out calculations, when dealing with data and results from experiments/investigations and everyday class work, making informed decisions based on the results of these calculations and understanding these results

2.2 Money, time and measurement
This means using and understanding time and measurement to solve problems and handle data in a variety of environmental science contexts, including practical and investigative

2.3 Information handling
Information handling means being able to interpret environmental science data in tables, charts and other graphical displays to draw sensible conclusions throughout the Course. It involves interpreting the data and considering its reliability in making reasoned deductions and informed decisions. It also involves an awareness and understanding of the chance of events happening.

Employability, enterprise and citizenship

4.6 Citizenship
Citizenship includes having concern for the environment and for others, being aware of rights and responsibilities, being outward looking towards society; being able to recognise one's personal role in this context, being aware of global issues, understanding one's responsibilities within these and acting responsibly. Learners will develop citizenship skills, when considering the applications of environmental science on our lives, as well as ethical implications.

Thinking skills
This is the ability to develop the cognitive skills of remembering and identifying, understanding and applying. The Course will allow learners to develop skills of applying, analysing and evaluating. Learners can analyse and evaluate practical work and data by reviewing the process, identifying issues and forming valid conclusions. They can demonstrate understanding and application of concepts and explain and interpret information and data.

5.3 **Applying**
Applying is the ability to use existing information to solve environmental science problems in different contexts, and to plan, organise and complete a task.

5.4 Analysing and evaluating
This covers the ability to identify and weigh-up the features of a situation or issue in environmental science and use judgement of them in coming to a conclusion. It includes reviewing and considering any potential solutions.

In addition, learners will also have opportunities to develop literacy skills, working with others and creating.

Literacy
Learners develop the literacy skills to effectively communicate key environmental science, concepts and describe clearly environmental science issues in various media forms. Learners will have opportunities to communicate knowledge and understanding, with an emphasis on applications and environmental, ethical and/or social impacts. Learners will have opportunities to develop listening and reading skills when gathering and processing information.

Working with Others
Learning activities provide many opportunities, in all areas of the Course, for learners to work with others. Practical activities and investigations, in particular, offer opportunities for group work, which is an important aspect of environmental science and should be encouraged.

Creating
Through learning in environmental science, learners can demonstrate their creativity. In particular, when planning and designing experiments/investigations, learners have the opportunity to be innovative in their approach. Learners also have the opportunities to make, write, say or do something new.

Approaches to assessment

Assessment should cover the mandatory skills, knowledge and understanding of the Course. Assessment should be integral to and improve learning and teaching. The approach should involve learners and provide supportive feedback. Self and peer assessment techniques should be used, where appropriate.

See the *Unit Support Notes* for guidance on approaches to assessment of the Units of the Course.

Added value

Courses from National 4 to Advanced Higher include assessment of added value. At National 4 the added value will be assessed in the Added Value Unit. Information given in the *Course Specification* and the *Added Value Unit Specification* about the assessment of added value is mandatory.

The Environmental Science Added Value Unit is assessed by an Assignment. Prior to doing this Unit, learners would benefit from having covered key areas from at least one of:

- Environmental Science: Living Environment (National 4)
- Environmental Science: Earth's Resources (National 4)
- Environmental Science: Sustainability (National 4)

It is intended that the majority of the time for the Added Value Unit should be spent in learning and teaching activities, which further develop the skills necessary to conduct investigative/practical work in Environmental Science. In addition, the learners should be suitably prepared to conduct simple background research using the internet.

If the *Added Value Unit* is delivered as part of a Course, then centres can deliver this Unit at an appropriate point during the Course.

Learners will use the skills, knowledge and understanding necessary to undertake an investigation into a topical issue in environmental science. The teacher/lecturer may provide guidance to learners on topics for study, taking into account the needs of their learners and the relevance to everyday issues. While the learner should choose the topic to be investigated, it would be reasonable for the choice the learner makes to be one where the teacher/lecturer has some expertise and has resources available to enable the learner to successfully meet the Assessment Standards.

The Assignment offers opportunities for Learners to work in partnership and in teams, though it must be clear, at each stage, that the learner has produced evidence of their contribution to any group work carried out.

Suggested investigations

Some suggested investigations are listed below which are likely to be familiar to assessors. Centres are free to select other appropriate investigations.

Investigations
Acid rain
Climate change
Deforestation
Hydro-electric power
Conservation of water
Intensive agriculture

A resource pack has been developed for one of these investigations and can be found in Appendix 2. This is not mandatory. Centres are free to develop their own investigations.

Combining assessment across Units

If an integrated approach to Course delivery is chosen, then there may be opportunities for combining assessment across Units. If this approach is used, then it is necessary to be able to track evidence for individual Outcomes and Assessment Standards.

Transfer of evidence

Evidence for the achievement of Outcome 1 and Assessment Standards 2.2, 2.3 and 2.4 for one Unit can be used as evidence of the achievement of Outcome 1 and Assessment Standards 2.2, 2.3 and 2.4 in the other Units of this Course.

Exemplification of standards

Assessment Standards can be achieved via a number of pieces of evidence covering work done on different occasions.

Assessors should record evidence of achievement of Outcomes and Assessment Standards. The table on the next page shows how the evidence has been recorded, with comments, where appropriate. These tables are not mandatory.

Candidate 1's report provides evidence for Assessment Standards 1.1 and 1.3 to 1.6.

Assessment Standard		Evidence required	Evidence produced
1.1	Planning an experiment/ practical investigation	Aim of experiment	Aim is stated in the candidate's report.
		Variable to be kept constant	Several appropriate variables are stated.
		Measurements/ observations to be made	Measurements to be made are stated.
		Resources	Resources are stated and shown in the labelled diagram.
		Method including safety	The method is described.
1.2	Following procedures safely	Procedures have been followed safely and correctly	The assessor used a checklist to record that they had seen the candidate carry out the procedure.
1.3	Making and recording observations/measurements accurately	Observations/ measurements taken are correct	Observations/ measurements are presented and these are correct.
1.4	Presenting results in an appropriate format	Results have been presented in an appropriate format	Results are presented in an appropriate format ie table and line graph. Units are used appropriately.
1.5	Drawing valid conclusions	What the experiment shows, with reference to the aim	A correct conclusion is stated.
1.6	Evaluating experimental procedures	The suggestion given will improve the experiment	An appropriate improvement is suggested.

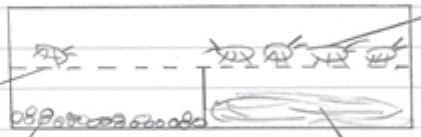
Candidate 1

Woodlouse experiment

Aim: To find out whether woodlice prefer damp or dry conditions. (1.1)

Equipment: Choice chamber
Cotton wool
Water
muselin (1.1)
silica gel
woodlice

Method:



Set up the equipment as shown in the diagram above. Leave it for about half an hour and then count how many woodlice are on the damp and dry sides. Record your results in an appropriate graph. (1.1) ✓

results

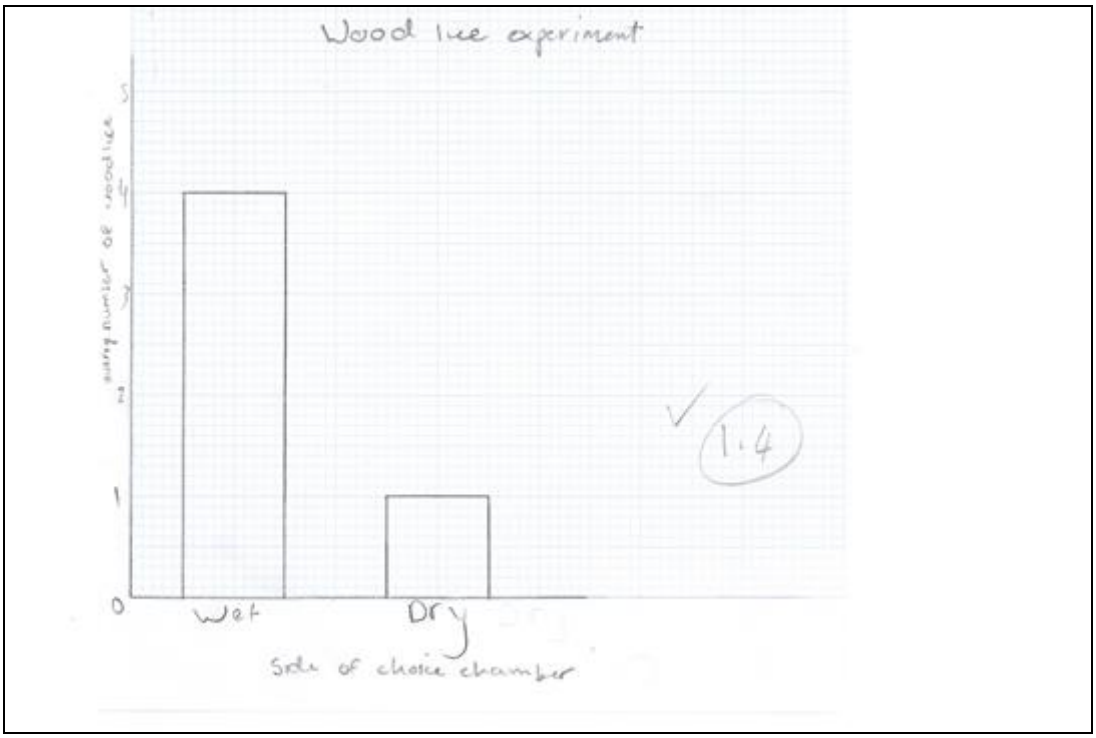
side	number of woodlice						Average no.
	Charlie	Joseph	Angus	Ryan	Sarah	Pam	
damp	5	4	3	4	4	5	4 5
dry	0	1	2	1	1	0	1

(1.4) ✓

Conclusion: Woodlice prefer damp areas to dry areas. This is what I would expect. (1.5) ✓

Evaluation: In this experiment the variables we kept the same are; temperature, light intensity and availability of oxygen. (1.1) ✓
This experiment could be improved by leaving the woodlice for longer and we could use more woodlice. (1.6) ✓

Candidate 1

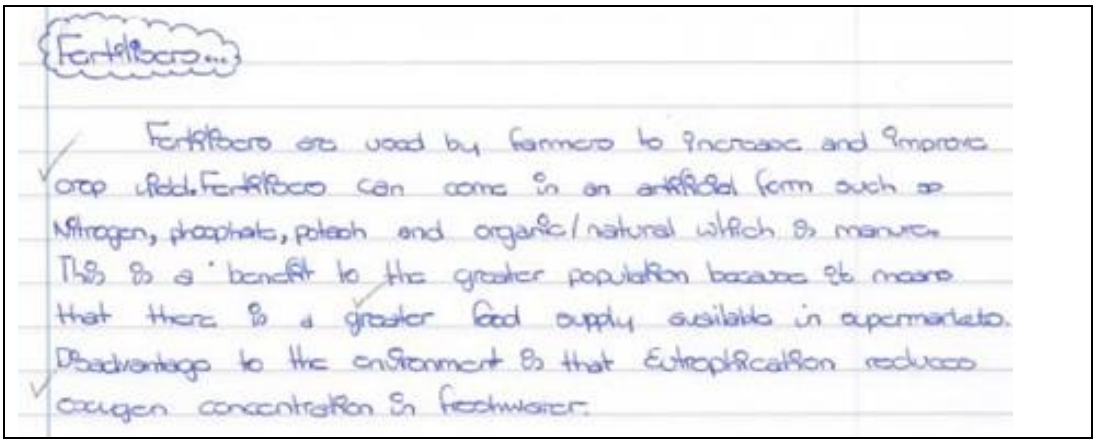

Wood lice experiment
average number of woodlice
5
4
3
2
1
0
Wet
Dry
Side of choice chamber
1.4

Candidates 2 and 3

The reports from Candidates 2 and 3 show how research into the same application/issue of environmental science produced individual evidence for Assessment Standards 2.2 and 2.3.

Assessment Standard	Evidence required	Evidence produced
2.2 Describing an application	The application is related to a key area of the Course	The assessor identified associated key areas of the Course — The nitrogen cycle and the environmental impact of fertilisers; The interaction between humans and the environment and the impact of human activity on an area; The role of agriculture in the production of food and raw material and its environmental impacts and sustainability. It is only necessary to relate to one key area.
	Application stated	Both candidates have given a relevant application – fertiliser use.
	Appropriate environmental science knowledge used to describe application	Each candidate has used appropriate National 4 Environmental Science knowledge to describe the application. Candidate 2's word count is appropriate for National 4. Although Candidate 3's report is larger than the suggested word count, this is acceptable.
2.3 Describing an environmental science issue in terms of its effect on the environment/ society	The issue is related to a key area of the Course	The assessor identified associated key areas of the Course — The nitrogen cycle and the environmental impact of fertilisers; The interaction between humans and the environment and the impact of human activity on an area; The role of agriculture in the production of food and raw material and its environmental impacts and sustainability. It is only necessary to relate to one key area.
	An environmental science issue is stated	The Environmental Science issue is identified — effects of fertiliser use
	Appropriate environmental science knowledge is used to describe its effect	Each candidate has used appropriate National 4 Environmental Science knowledge to describe the issue and its effect. Effects on both the environment and society are described. It is not required that both are given.

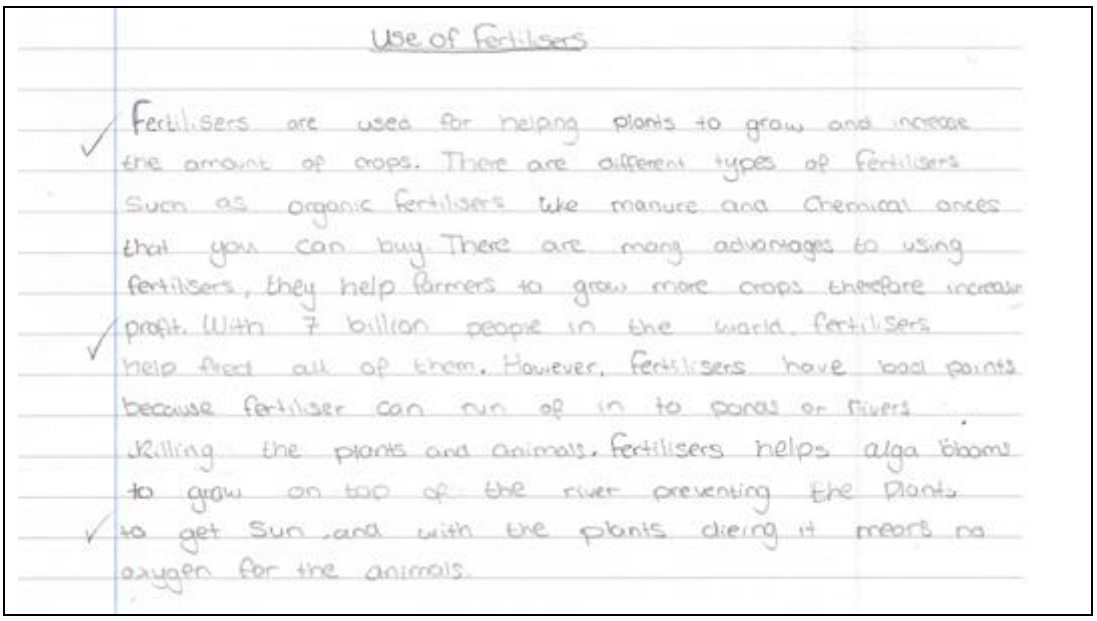
Candidate 2



Fertilisers...

Fertilisers are used by farmers to increase and improve crop yield. Fertilisers can come in an artificial form such as Nitrogen, phosphate, potash and organic/natural which is manure. This is a benefit to the greater population because it means that there is a greater food supply available in supermarkets. Disadvantage to the environment is that Eutrophication reduces oxygen concentration in freshwater.

Candidate 3



Use of Fertilisers

Fertilisers are used for helping plants to grow and increase the amount of crops. There are different types of fertilisers such as organic fertilisers like manure and chemical ones that you can buy. There are many advantages to using fertilisers, they help farmers to grow more crops therefore increase profit. With 7 billion people in the world, fertilisers help feed all of them. However, fertilisers have bad points because fertiliser can run off in to pond or rivers killing the plants and animals. fertilisers helps alga blooms to grow on top of the river preventing the plants to get sun and with the plants dieing it means no oxygen for the animals.

Equality and inclusion

The following should be taken into consideration:

Situation	Reasonable Adjustment
Carrying out practical activities	Use could be made of practical helpers for learners with: ♦ physical disabilities, especially manual dexterity, when carrying out practical activities ♦ visual impairment who have difficulty distinguishing colour changes or other visual information
Reading, writing and presenting text, symbolic representation, tables, maps, graphs and diagrams	Use could be made of ICT, enlarged text, alternative paper and/or print colour and/or practical helpers for learners with visual impairment, specific learning difficulties and physical disabilities
Process information using calculations	Use could be made of practical helpers for learners with specific cognitive difficulties (eg dyscalculia)
Draw a valid conclusion, giving explanations and making generalisation/predictions	Use could be made of practical helpers for learners with specific cognitive difficulties or autism

As far as possible, reasonable adjustments should be made for the Assignment, where necessary. This includes the use of 'practical helpers', readers, scribes, adapted equipment or assistive technologies.

It is recognised that centres have their own duties under equality and other legislation and policy initiatives. The guidance given in these *Course Support Notes* is designed to sit alongside these duties but is specific to the delivery and assessment of the Course.

It is important that centres are aware of and understand SQA's assessment arrangements for disabled learners, and those with additional support needs, when making requests for adjustments to published assessment arrangements. Centres will find more guidance on this in the series of publications on Assessment Arrangements on SQA's website: www.sqa.org.uk/sqa/14977.html.

Appendix 1: Reference documents

The following reference documents will provide useful information and background.

- Assessment Arrangements (for disabled learners and/or those with additional support needs) — various publications are available on SQA's website at: www.sqa.org.uk/sqa//14977.html.
- *Building the Curriculum 3: A framework for Learning and Teaching*
- *Building the Curriculum 4: Skills for learning, skills for life and skills for work*
- *Building the Curriculum 5: A framework for assessment*
- Course Specifications
- Design Principles for National Courses
- *Guide to Assessment* (June 2008)
- Overview of Qualification Reports
- Principles and practice papers for Sciences and Social Studies curriculum areas
- Science: A Portrait of current practice in Scottish schools (Nov 2008)
- *SCQF Handbook: User Guide* (published 2009) and SCQF level descriptors (to be reviewed during 2011 to 2012): www.sqa.org.uk/sqa/4595.html
- *SQA Skills Framework: Skills for Learning, Skills for Life and Skills for Work*
- *Skills for Learning, Skills for Life and Skills for Work: Using the Curriculum Tool*

Appendix 2: Resource pack

National 4 Environmental Science: Added Value Unit

Resource pack: Natural and artificial fertilisers: impact on crop yield, impact on the environmental and sustainable use

Relationship to Course
Sustainability Unit, Key area: the role of agriculture in the production of food and raw material and its environmental impacts and sustainability.

Outcome 1
The candidate will apply skills and knowledge to investigate a topical issue in environmental science and its impact on society/the environment by:

1.1 Choosing, with justification, a relevant issue in environmental science
1.2 Researching the issue
1.3 Presenting appropriate information/data
1.4 Explaining the impact, in terms of the environmental science involved
1.5 Communicating the findings of the investigation

The sections in this pack provide background information on:

1. Crop growing
2. Why fertilisers are required
3. Natural fertilisers
4. Artificial fertilisers
5. Crop yield
6. Environmental impact
7. Advantages and disadvantages of natural an artificial fertilisers
8. Sustainable approaches to using fertilisers

Background information

This pack compares natural fertilisers and artificial fertilisers in terms of crop yield, their environmental impact and their sustainable use.

1. Crop growing

The UK is one of the most densely populated countries in the world. There is only a limited area of land which can be farmed for food and most of this agricultural land is already being used. In fact, most of the available land in the country is devoted to growing food: urban 11%; woodland and national parks 20%; agriculture and countryside 69%.

The principal crops grown in the UK are: wheat, barley, oats, potatoes, sugar beet, vegetables, oil seed rape, and various fruits, such as apples.

2. Why are fertilisers required?

As plants grow, they take in nutrients, such as nitrogen, phosphorus and potassium, to grow healthily. This reduces the level of nutrients in the soil.

Crop yields are dependent on the levels of nutrients in the soil. To keep the soil capable of growing further crops, nutrients that have been removed by the crop plants must be replaced. Fertilisers replace the nutrients used by crops in previous years. The use of fertilisers helps to close the 'nutrient gap' that arises and allows the farmer to get most out of the land.

Fertilisers are important to improve crop yield and quality. They continue to play a key part in modernising agriculture allowing farmers to keep pace with the needs of an ever increasing global population.

3. Natural fertilisers

Natural fertilisers include compost, manure, slurry, fish waste, blood and bone meal, and seaweed. There is a view that the use of natural fertilisers produces more nutritious food. Some people believe that these fertilisers have a less damaging effect on the environment.

http://mcgearyorganics.com/organics.html
http://www.rsc.org/get-involved/hot-topics/organic-vs-non-organic/Index.asp

4. Artificial fertilisers

Artificial fertilisers are manufactured in factories. They contain nitrogen, phosphorus and potassium. Some people believe that these fertilisers are a source of pollution.

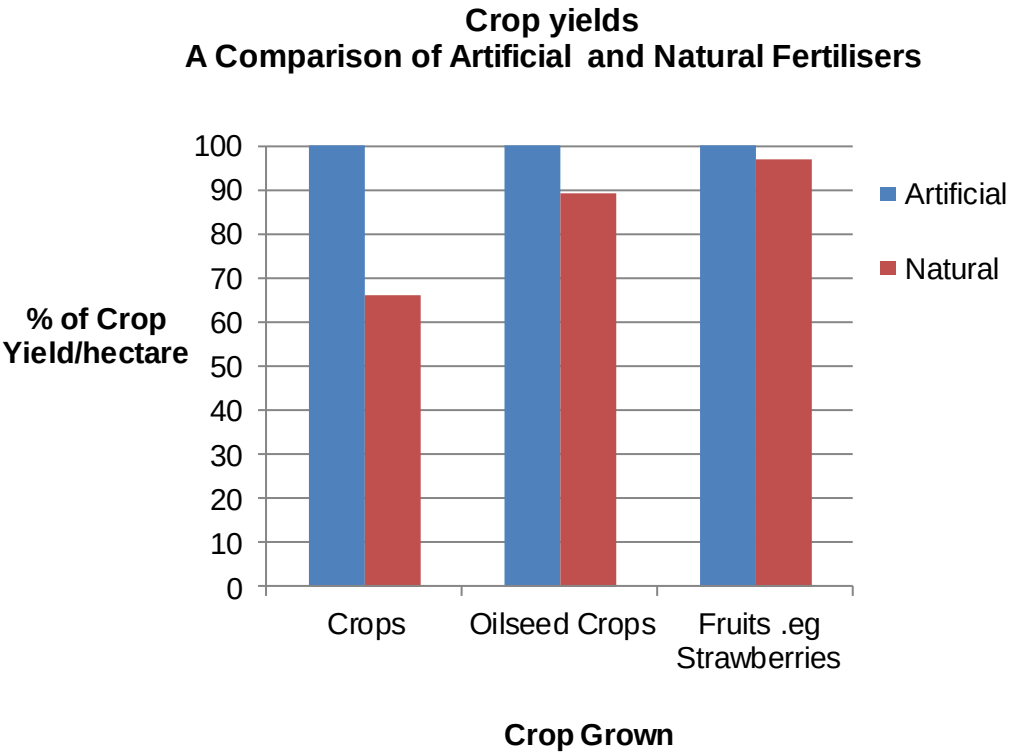
5. Crop yield

A major advantage of fertilisers is that they offer a convenient and easy way to increase yields. This helps food production keep pace with the needs of an ever increasing global population, providing more food for more people.

The results below show how natural and artificial fertilisers affect crop yield. The comparison of crop yield/hectare is given for three different crop types.
Some crops use more nutrients from the soil than others.

'Crops' include some cereal crops, such as wheat and barley, which are a major part of the food consumed around the world.

http://www.nature.com/news/organic-farming-is-rarely-enough-1.10519



6. Environmental impact

a. Land use. There can be no increase in farming land becoming available without affecting the natural environment. This can cause the loss of other ecosystems and habitats.

b. The application of fertilisers has to be carefully managed, as misuse may cause damage to the environment. An example of this is the impact of eutrophication.

http://www.teachingideas.co.uk/science/files/eutrophication.pd
http://www.youtube.com/watch?v=6LAT1gLMPu4

7. Advantages and disadvantage of natural and artificial fertilisers

The table below lists some advantages and disadvantages of natural and artificial fertilisers.

Fertiliser	Advantages	Disadvantages
Natural	♦ Re-use of natural waste materials like animal manure and food processing waste ♦ Improves soil structure ♦ Reduces soil erosion ♦ Increases water retention within the soil, reducing nutrient leaching into local rivers ♦ Reduces eutrophication	♦ Incomplete composting can leave certain dangerous bacteria in the natural waste ♦ These bacteria may enter the water system or the food crops, causing human health and environmental problems ♦ Can attract pest species requiring the use of pesticides to remove them
Artificial	♦ Fast acting ♦ Contains known concentrations of nutrients ♦ Easy to use and apply ♦ Easily transported	♦ High energy cost in manufacture ♦ Do not improve soil structure ♦ Require more frequent application ♦ Excess fertiliser is more likely to run off into local rivers causing increased eutrophication

Both natural and artificial fertilisers can damage the environment if used at the wrong time of year. This may be due to the weather conditions and also at what phase the plants are growing, eg germination and plant growth.

http://organic.lovetoknow.com/Advantages_and_Disadvantages_of_Organic_Fertilize

8 Sustainable approaches to using fertilisers

A high standard of fertiliser management contributes to sustainable food production. It further benefits the farm industry, by reducing the risk of pollution and costly over-application of fertiliser.

Most soil-related farm activities increase the likelihood of a greenhouse gas, called nitrous oxide, being released. These nitrous oxide emissions originate from three sources:

- soil microorganism activity (55%)
- organic manure applications (18%)
- nitrogen fertiliser applications (27%)

Ensuring good nutrient uptake by crops helps minimise the amount remaining in the soil. Unused fertilisers could have a negative effect on the environment. Good nutrient management produces a healthy, well structured, soil by using the most appropriate techniques to apply the right amount of nutrients, either natural or artificial, at the correct time, in a sustainable way.

http://www.defra.gov.uk/publications/files/pb13558-cogap-090202.pdf

http://www.farmingfutures.org.uk/sites/default/files/casestudy/pdf/FF_FS21_REVOCT09WEB.pdf

Additional useful websites

http://www.sciencedaily.com/releases/2012/04/120425140114.htm
http://resources.woodlands-junior.kent.sch.uk/customs/questions/farming.html
http://www.ukagriculture.com/food/food_fast_facts.cfm
http://kemira.dbt.co.uk/documents/fertiliser/FFFBooklet.pdf
http://www.foodsecurity.ac.uk/food/uk-gas.html
http://www.independent.co.uk/environment/green-living/the-great-organic-myths-why-organic-foods-are-an-indulgence-the-world-cant-afford-818585.html
http://www.rsc.org/chemsoc/chembytes/hottopics/organic/index.asp
http://news.bbc.co.uk/1/hi/world/europe/8303434.stm
http://news.bbc.co.uk/1/hi/world/7284196.stm
http://www.allotment.org.uk/grow-your-own/fertiliser

Administrative information

Published: April 2012 (version 1.0)

History of changes to Course Support Notes

Course details	Version	Description of change	Authorised by	Date

Unit Support Notes

Unit Support Notes — Environmental Science: Living Environment (National 4)

Introduction

These support notes are not mandatory. They provide advice and guidance on approaches to delivering and assessing the Environmental Science: Living Environment (National 4) Unit. They are intended for teachers and lecturers who are delivering this Unit. They should be read in conjunction with:

- the *Unit Specification*
- the *Course Specification*
- *Added Value Unit Specification*
- the *Course Support Notes*
- appropriate assessment support materials

General guidance on the Unit

Aims

The general aim of this Unit is to develop skills of scientific inquiry, investigation and analytical thinking, along with knowledge and understanding of the living environment. Learners will apply these skills when considering the applications of the living environment on our lives, as well as the implications on society/the environment. This can be done by using a variety of approaches, including investigation and problem solving. The Unit covers the key areas of:

- Interdependence
- Adaptation for survival
- The impact of population growth and natural hazards on biodiversity
- The nitrogen cycle
- The environmental impact of fertilisers

Learners will research issues, apply scientific skills and communicate information related to their findings, which will develop skills of scientific literacy.

Progression into this Unit

Entry to this Unit is at the discretion of the centre. However, learners would normally be expected to have attained the skills, knowledge and understanding required by the following or equivalent qualifications and/or experience:

- National 3 Environmental Science Course

There may also be progression from National 3 Biology, National 3 Chemistry, National 3 Geography, National 3 Physics or National 3 Science Courses.

Skills, knowledge and understanding covered in this Unit

Information about skills, knowledge and understanding is given in the Environmental Science National 4 Course Support Notes.

If this Unit is being delivered on a free-standing basis, teachers and lecturers should cover the mandatory skills and key areas in ways which are most appropriate for delivery in their centres.

Progression from this Unit

This Unit may provide progression to:

- Other qualifications in Environmental Science or related areas
- Further study, employment and/or training

Approaches to learning and teaching

Approaches to learning and teaching and suggested learning activities are covered in the *Course Support Notes*.

Developing skills for learning, skills for life and skills for work

Information about developing skills for learning, skills for life and skills for work in this Unit, is given in the relevant Course Support Notes.

Approaches to assessment and gathering evidence

The purpose of this section is to give advice on approaches to assessment for the Unit. There will be other documents produced for centres to provide exemplification of assessments and guidance on how to write them.

Approaches to the assessment of a Unit when it forms part of a Course may differ from approaches to assessing the same Unit when it is not being delivered as part of a Course. If an integrated approach to Course delivery is chosen, then there may be opportunities for combining assessment across Units.

Assessments must be valid, reliable and fit for purpose for the subject and level, and should fit in with learning and teaching approaches.

Unit assessment should support learning and teaching and, where possible, enable personalisation and choice for learners in assessment methods and processes. Teachers and lecturers should select the assessment methods they believe are most appropriate, taking into account the needs of their learners and the requirements of the Unit.

There is no mandatory order for delivery of the Outcomes. These should be overtaken throughout the Unit and are an integral part of learning and teaching.

The table below gives guidance and advice on possible approaches to assessment and gathering evidence:

Strategies for gathering evidence
There may be opportunities in the day-to-day delivery of the Units in a Course to observe learners providing evidence, which satisfies completely, or partially, a Unit or Units. This is naturally occurring evidence and can be recorded as evidence for an Outcome or parts of an Outcome. In some cases, additional evidence may also be required to supplement and confirm the naturally occurring evidence. Approaches to assessment might cover the whole Unit or be combined across Outcomes. A holistic approach can enrich the assessment process for the learner by bringing together different Outcomes and/or Assessment Standards. If a holistic approach is used, then it is necessary to be able to track individual Assessment Standard evidence. Strategies for gathering evidence and ensuring that the learners' work is their own could include: ♦ personal interviews during which the teacher or lecturer can ask additional questions about completed work ♦ an oral presentation on their work ♦ writing reports in supervised conditions ♦ checklists to record the authenticity ♦ supplementary sources of evidence, such as witness testimony, film or audio clips Evidence can be gathered from classwork, experiments, investigations and/or research carried out in this Unit. It can be obtained using one or more of the strategies outlined above or by alternative methods, which could include a test of knowledge, understanding and skills.

Equality and inclusion

The *Course Support Notes* provide full information on equality and inclusion for this Unit.

It is recognised that centres have their own duties under equality and other legislation and policy initiatives. The guidance given in these *Unit Support Notes* is designed to sit alongside these duties but is specific to the delivery and assessment of the Unit.

Alternative approaches to Unit assessment to take account of the specific needs of learners can be used. However, the centre must be satisfied that the integrity of the assessment is maintained and where the alternative approach to assessment will, in fact, generate the necessary evidence of achievement.

Appendix 1: Reference documents

The following reference documents will provide useful information and background.

- Assessment Arrangements (for disabled candidates and/or those with additional support needs) — various publications on SQA's website: http://www.sqa.org.uk/sqa/14976.html
- *Building the Curriculum 4: Skills for learning, skills for life and skills for work*
- *Building the Curriculum 5: A framework for assessment*
- Course Specifications
- Design Principles for National Courses
- *Guide to Assessment* (June 2008)
- Overview of Qualification Reports
- *Principles and practice papers for curriculum areas*
- *Research Report 4 — Less is More: Good Practice in Reducing Assessment Time*
- *Coursework Authenticity — a Guide for Teachers and Lecturers*
- *SCQF Handbook: User Guide (published 2009)* and SCQF level descriptors (to be reviewed during 2011 to 2012): www.sqa.org.uk/sqa/4595.html
- *SQA Skills Framework: Skills for Learning, Skills for Life and Skills for Work*
- *Skills for Learning, Skills for Life and Skills for Work: Using the Curriculum Tool*
- SQA Guidelines on e-assessment for Schools
- SQA Guidelines on Online Assessment for Further Education

SQA e-assessment web page: www.sqa.org.uk/sqa/5606.html

Administrative information

Published: June 2013 (version 1.1)

Superclass: QA

History of changes to Unit Support Notes

Unit details	Version	Description of change	Authorised by	Date
	1.1	Learner exemplar materials and resource pack added	Qualifications Development Manager	June 2013

Unit Support Notes

Unit Support Notes — Environmental Science: Earth's Resources (National 4)

Please refer to the note of changes at the end of this document for details of changes from previous version (where applicable).

Introduction

These support notes are not mandatory. They provide advice and guidance on approaches to delivering and assessing the Environmental Science: Earth's Resources (National 4) Unit. They are intended for teachers and lecturers who are delivering this Unit. They should be read in conjunction with:

- the *Unit Specification*
- the *Course Specification*
- the *Added Value Unit Specification*
- the *Course Support Notes*
- appropriate assessment support materials

General guidance on the Unit

Aims

The general aim of this Unit is to develop skills of scientific inquiry, investigation and analytical thinking, along with knowledge and understanding of the Earth's resources.

Learners will apply these skills when considering the applications of the earth's resources on our lives, as well as the implications on society/the environment. This can be done by using a variety of approaches, including investigation and problem solving.

The Unit covers the key areas of:

- The responsible use and conservation of non-renewable and renewable resources
- The formation and use of fossil fuels
- The derivation and uses of materials derived from crude oil
- The risks and benefits of different energy sources, including those produced from plants
- The carbon cycle
- Processes involved in maintaining the balance of gases in the air
- The causes and implications of changes in the balance

Learners will research issues, apply scientific skills and communicate information related to their findings, which will develop skills of scientific literacy.

Progression into this Unit

Entry to this Unit is at the discretion of the centre. However, learners would normally be expected to have attained the skills, knowledge and understanding required by the following or equivalent qualifications and/or experience:

- National 3 Environmental Science Course

There may also be progression from National 3 Biology, National 3 Chemistry, National 3 Geography, National 3 Physics or National 3 Science Courses.

Skills, knowledge and understanding covered in this Unit

Information about skills, knowledge and understanding is given in the Environmental Science National 4 *Course Support Notes*.

If this Unit is being delivered on a free-standing basis, teachers and lecturers should cover the mandatory skills and key areas in ways which are most appropriate for delivery in their centres.

Progression from this Unit

This Unit may provide progression to:

- Other qualifications in Environmental Science or related areas
- Further study, employment and/or training

Approaches to learning and teaching

Approaches to learning and teaching and suggested learning activities are covered in the *Course Support Notes*.

Developing skills for learning, skills for life and skills for work

Information about developing skills for learning, skills for life and skills for work in this Unit, is given in the relevant *Course Support Notes*.

Approaches to assessment and gathering evidence

The purpose of this section is to give advice on approaches to assessment for the Unit. There will be other documents produced for centres to provide exemplification of assessments and guidance on how to write them.

Approaches to the assessment of a Unit when it forms part of a Course may differ from approaches to assessing the same Unit when it is not being delivered as part of a Course. If an integrated approach to Course delivery is chosen, then there may be opportunities for combining assessment across Units.

Assessments must be valid, reliable and fit for purpose for the subject and level, and should fit in with learning and teaching approaches.

Unit assessment should support learning and teaching and, where possible, enable personalisation and choice for learners in assessment methods and processes. Teachers and lecturers should select the assessment methods they believe are most appropriate, taking into account the needs of their learners and the requirements of the Unit.

There is no mandatory order for delivery of the Outcomes. These should be overtaken throughout the Unit and are an integral part of learning and teaching.

The table below gives guidance and advice on possible approaches to assessment and gathering evidence:

Strategies for gathering evidence
There may be opportunities in the day-to-day delivery of the Units in a Course to observe learners providing evidence, which satisfies completely, or partially, a Unit or Units. This is naturally occurring evidence and can be recorded as evidence for an Outcome or parts of an Outcome. In some cases, additional evidence may also be required to supplement and confirm the naturally occurring evidence. Approaches to assessment might cover the whole Unit or be combined across Outcomes. A holistic approach can enrich the assessment process for the

learner by bringing together different Outcomes and/or Assessment Standards. If a holistic approach is used, then it is necessary to be able to track individual Assessment Standard evidence.
Strategies for gathering evidence and ensuring that the learners' work is their own could include:

- personal interviews during which the teacher or lecturer can ask additional questions about completed work
- an oral presentation on their work
- writing reports in supervised conditions
- checklists to record the authenticity
- supplementary sources of evidence, such as witness testimony, film or audio clips

Evidence can be gathered from classwork, experiments, investigations and/or research carried out in this Unit. It can be obtained using one or more of the strategies outlined above or by alternative methods, which could include a test of knowledge, understanding and skills.

Equality and inclusion

The *Course Support Notes* provide full information on equality and inclusion for this Unit.

It is recognised that centres have their own duties under equality and other legislation and policy initiatives. The guidance given in these *Unit Support Notes* is designed to sit alongside these duties but is specific to the delivery and assessment of the Unit.

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- *Coursework Authenticity — a Guide for Teachers and Lecturers*
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Administrative information

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Superclass: QA

History of changes to Unit Support Notes

Unit details	Version	Description of change	Authorised by	Date
	1.1	Learner exemplar materials and resource pack added	Qualifications Development Manager	June 2013

Unit Support Notes

Unit Support Notes — Environmental Science: Sustainability (National 4)

Please refer to the note of changes at the end of this document for details of changes from previous version (where applicable).

Introduction

These support notes are not mandatory. They provide advice and guidance on approaches to delivering and assessing the Environmental Science: Sustainability (National 4) Unit. They are intended for teachers and lecturers who are delivering this Unit. They should be read in conjunction with:

- the *Unit Specification*
- the *Course Specification*
- the *Added Value Unit Specification*
- the *Course Support Notes*
- appropriate assessment support materials

General guidance on the Unit

Aims

The general aim of this Unit is to develop skills of scientific inquiry, investigation and analytical thinking, along with knowledge and understanding sustainability. Learners will apply these skills when considering the applications of sustainability on our lives, as well as the implications on society/the environment. This can be done by using a variety of approaches, including investigation and problem solving.

The Unit covers the key areas of:

- The sustainability of key natural resources and possible implications for human activity
- The interaction between humans and the environment and the impact of human activity on an area
- The role of agriculture in the production of food and raw material and its environmental impacts and sustainability
- Society's energy needs
- The impact of developments in transport infrastructure in a selected area and development of sustainable systems

Learners will research issues, apply scientific skills and communicate information related to their findings, which will develop skills of scientific literacy.

Progression into this Unit

Entry to this Unit is at the discretion of the centre. However, learners would normally be expected to have attained the skills, knowledge and understanding required by the following or equivalent qualifications and/or experience:

- National 3 Environmental Science Course

There may also be progression from National 3 Biology, National 3 Chemistry, National 3 Geography, National 3 Physics or National 3 Science Courses.

Skills, knowledge and understanding covered in this Unit

Information about skills, knowledge and understanding is given in the Environmental Science National 4 *Course Support Notes*.

If this Unit is being delivered on a free-standing basis, teachers and lecturers should cover the mandatory skills and key areas in ways which are most appropriate for delivery in their centres.

Progression from this Unit

This Unit may provide progression to:

- Other qualifications in Environmental Science or related areas
- Further study, employment and/or training

Approaches to learning, teaching and assessment

Approaches to learning and teaching and suggested learning activities are covered in the *Course Support Notes*.

Developing skills for learning, skills for life and skills for work

Information about developing skills for learning, skills for life and skills for work in this Unit, is given in the relevant *Course Support Notes*.

General guidance on assessment

The purpose of this section is to give advice on approaches to assessment for the Unit. There will be other documents produced for centres to provide exemplification of assessments and guidance on how to write them.

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There is no mandatory order for delivery of the Outcomes. These should be overtaken throughout the Unit and are an integral part of learning and teaching.

The table below gives guidance and advice on possible approaches to assessment and gathering evidence:

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- supplementary sources of evidence, such as witness testimony, film or audio clips

Evidence can be gathered from classwork, experiments, investigations and/or research carried out in this Unit. It can be obtained using one or more of the strategies outlined above or by alternative methods, which could include a test of knowledge, understanding and skills.

Equality and inclusion

The *Course Support Notes* provide full information on equality and inclusion for this Unit.

It is recognised that centres have their own duties under equality and other legislation and policy initiatives. The guidance given in these *Unit Support Notes* is designed to sit alongside these duties but is specific to the delivery and assessment of the Unit.

Alternative approaches to Unit assessment to take account of the specific needs of learners can be used. However, the centre must be satisfied that the integrity of the assessment is maintained and where the alternative approach to assessment will, in fact, generate the necessary evidence of achievement.

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- *Coursework Authenticity — a Guide for Teachers and Lecturers*
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- SQA e-assessment web page: www.sqa.org.uk/sqa/5606.html

Administrative information

Published: June 2013 (version 1.1)

Superclass: QA

History of changes to Unit Support Notes

Unit details	Version	Description of change	Authorised by	Date
	1.1	Learner exemplar materials and resource pack added	Qualifications Development Manager	June 2013