

**SCIENCE**  
**Access 1**

**Fourth edition – published September 2003**

**NOTE OF CHANGES  
FOURTH EDITION PUBLISHED SEPTEMBER 2003**

**SUBJECT TITLE:** Science (Access 1)

**Introductory Information:**

Details: Reductions in Assessment

## SCIENCE (ACCESS 1)

The Science provision at Access 1 comprises four units:

<i>D3NH 07</i>	<i>Science: Carrying out Experiments</i>	<i>1 credit (40 hours)</i>
<i>D3NJ 07</i>	<i>Science: Handling Information</i>	<i>1 credit (40 hours)</i>
<i>D92M 07</i>	<i>Physics: Carrying Out Practical Experiments</i>	<i>1 credit (40 hours)</i>
<i>D92N 07</i>	<i>Physics: Handling Information</i>	<i>1 credit (40 hours)</i>

## RECOMMENDED ENTRY

Entry is at the discretion of the centre.

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### Administrative Information

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## **Introductory Information: Science (Access 1)**

### **RATIONALE**

These units offer candidates opportunities to study science at an appropriate level and to begin to develop an understanding of some of its basic principles and techniques. This is done by emphasising and promoting a practical and problem-solving approach, together with an understanding of relevant applications of science in society.

### **AIMS**

It is hoped that attitudes such as being open-minded, inquisitive and willing to recognise alternative points of view will be encouraged and that basic skills can be encouraged and developed as part of a cross-curricular approach. Skills and abilities developed through practical activities and information handling should support learning as a whole. It is also hoped that candidates' abilities to sustain effort and concentration, come to conclusions, make decisions, complete a process and evaluate their work will be developed.

### **CONTENT**

Candidates will be working in a range of contexts, and units have been designed to allow teachers/lecturers as much flexibility as possible in choice of suitable content. This approach will ensure that the units can be offered in as wide a range of centres as possible, but will also ensure that candidates experience a range of aspects of science.

In the Access 2 Science Cluster, four units are available:

*D04A 08 Biology (Access 2)*

*D03Y 08 Chemistry (Access 2)*

*D04P 08 Physics (Access 2)*

*D04B 08 Science (Access 2)*

Access 1 Science provision consists of four units. Two are derived from the Unit *D04B 08 Science (Access 2)* and two from the unit *D04P 08 Physics (Access 2)*.

### **APPROACHES TO LEARNING AND TEACHING**

A practical investigative approach should be taken to learning and teaching. Such an approach provides opportunities to develop individual and group activities using a variety of resources. Some further advice is given in the Support Notes for the units.

### **ASSESSMENT**

There is no external assessment at Access 1 level.

In unit *D3NH 07 Science: Carrying out Experiments (Access 1)* candidates are required to be involved in a minimum of six experiments drawn from at least three different contexts. In the unit *D3NJ 07 Science: Handling Information (Access 2)* they should undertake a minimum of six activities, drawn from three different contexts, involving handling information from a provided source.

## Introductory Information (cont): Science (Access 1)

In units *D92M 07 Physics: Carrying out Practical Experiments (Access 1)* and *D92N 07 Physics: Handling Information (Access 1)* candidates carry out activities drawn from at least three different physics contexts. The contexts are specified:

- Energy
- Forces
- Electricity
- Light, colour and sound
- Magnetism
- Earth and space

Individual centres are free to choose any specified contexts and to identify topics and activities within the chosen contexts. Examples of topics and activities are provided in the support notes to the units.

In the unit *D92M 07 Physics: Carrying Out Practical Experiments (Access 1)* candidates are required to be involved in a minimum of six experiments drawn from at least three different contexts.

In the unit *D92N 07 Physics: Handling Information (Access 1)* candidates are required to be involved in a minimum of six activities, drawn from three different contexts, involving handling information from a provided source.

### GUIDANCE ON CERTIFICATION AND MODERATION

Each Access 1 unit will normally be certificated as an individual unit. However, Access 1 units derived from units at Access 2 allow the evidence of achievement of Access 1 units to be used to count towards achievement of the relevant Access 2 unit. To allow this to happen for unit *D04B 08 Science (Access 2)*, candidates would require evidence of attainment of one of the following two units:

*D3NH 07 Science: Carrying Out Experiments (Access 1)*

*D3NJ 07 Science: Handling Information (Access 1)*

Following achievement of one of these units, candidates should be entered for *D04B 08: Science (Access 2)* and **not** for the remaining Access 1 unit. They should then complete the remaining outcome of the Access 2 unit. Before submitting results for the Access 2 unit, centres should ensure that candidates' skills are still current.

To achieve unit *D04P 08 Physics (Access 2)*, candidates would require evidence of attainment of one of the following units:

*D92M 07 Physics: Carrying Out Practical Experiments (Access 1)*

*D92N 07 Physics: Handling Information (Access 1)*

Following achievement of one of these units, candidates should be entered for *D04P 08 Physics (Access 2)* and **not** for the remaining Access 1 unit. They should then complete the remaining outcome of the Access 2 unit. Before submitting results for the Access 2 unit, centres should ensure that candidates' skills are still current.

## **Introductory Information (cont): Science (Access 1)**

Evidence of achievement for all units should be available for moderation. Part of this evidence may be in the form of a candidate's Scottish Qualifications Certificate showing achievement of the Access 1 units, or actual evidence from doing the units if this is still within the timescale for centres to retain evidence. (See *Putting Assessment Moderation Policy into Operation* April 1999.)

### **SPECIAL NEEDS**

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).

## **National Unit Specification: general information**

**UNIT** Science: Carrying Out Experiments (Access 1)

**NUMBER** D3NH 07

### **SUMMARY**

This unit offers the opportunity to explore some practical applications of science and to carry out a range of practical activities.

### **OUTCOME**

Carry out practical experiments.

### **RECOMMENDED ENTRY**

Entry is at the discretion of the centre. However, it would be beneficial if a candidate has already been involved in a Science programme, for example, a programme using Access 1 curriculum descriptors.

### **CREDIT VALUE**

1 credit at Access 1.

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### **Administrative Information**

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## National Unit Specification: statement of standards

### UNIT Science: Carrying Out Experiments (Access 1)

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

Carry out practical experiments.

#### Performance criteria

- (a) A realistic plan is prepared.
- (b) Participation in the experiment is active.
- (c) The procedures are followed safely and according to the plan.
- (d) Relevant measurements or observations are recorded in an appropriate format.
- (e) The experiment is reviewed and evaluated.

#### Evidence requirements

- PC (a)                      The plan should include:
- aim and main features of the experiment
  - outline of three to five simple steps
  - familiar equipment and materials selected for the experiment.
- PCs (b) and (c)              Evidence of safe and active participation in the planned experiment may be recorded using an observation checklist.
- PCs (d) and (e)              A record of the results/observations and a statement about the strengths or weaknesses of the experiment. At least two points should be identified by the candidate.

Evidence may be verbal or non-verbal and may include one or more of the following: speech, writing, signing, lip-reading, Braille, word-processing, computer assisted communication.

Candidates are required to be involved in three experiments made up of one from each of three different contexts. One of these contexts should be from Biology, one from Chemistry and one from Physics.

## National Unit Specification: support notes

### UNIT Science: Carrying Out Experiments (Access 1)

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

This unit is derived from the unit *D04B 08 Science (Access 2)*. Candidates may find this an appropriate unit to undertake on its own, or in conjunction with the other Access 1 unit *D3NJ 07: Science – Handling Information (Access 1)*.

The possible contexts for this unit are listed below:

<b>Biology</b>	<b>Chemistry</b>	<b>Physics</b>
The Living Body Plants The Environment Healthy Bodies The Animal Kingdom Detergents	Fuels Drugs Matter/Substances Metals Clothing, Fibres and Dyes Acids and Alkalis	Energy Forces Electricity Magnetism Light, Colour and Sound Earth and Space

The table below gives an illustration, for three of the possible contexts, of the kind of topics which could be considered. One of the contexts is from Biology, one from Chemistry and one from Physics. Further exemplification of contexts is given in the Access 2 Cluster for Science. The table provides some suggested experimental activities. However, individual centres are free to choose any of the contexts and to identify other topics and activities within the chosen contexts, as long as one is from Biology, one from Chemistry and one from Physics.

<b>Context (Chemistry)</b>	<b>Topics</b>	<b>Experiments</b>
Fuels	Fire and fire safety  Food as fuel	<ul style="list-style-type: none"><li>Investigate the effect of oxygen starvation on a flame – vary size of beaker and measure time for flame to extinguish.</li><li>Test a variety of flameproof and non-flameproof materials.</li><li>Burn different food types, e.g. peanuts, sugar, and investigate heat produced.</li><li>Investigate the products of burning such foods.</li></ul>

## National Unit Specification: support notes (cont)

### UNIT Science: Carrying Out Experiments (Access 1)

Context (Biology)	Topics	Experiments
Plants	Variety of plants	<ul style="list-style-type: none"> <li>• Test green and variegated leaves for the presence of starch.</li> <li>• Test acidity of soil in a coniferous and a deciduous forest.</li> <li>• Plan and carry out a survey of the different plants growing in a small area.</li> </ul>
	Seed biology	<ul style="list-style-type: none"> <li>• Investigate the best conditions for seed germination, e.g. heat, light, moisture.</li> <li>• Design and carry out an investigation into which kind of wind - dispersed seed travels the furthest when dropped from the same height.</li> </ul>
	Plant development	<ul style="list-style-type: none"> <li>• Investigate the best solutions/media for growth of pollen tubes.</li> <li>• Investigate how the direction of light affects plant growth.</li> </ul>
	Plant growth	<ul style="list-style-type: none"> <li>• Investigate the effect on growth of different conditions – air, water, temperature, soil, drainage.</li> </ul>

Context (Physics)	Topics	Experiments
Forces	Push and pull	<ul style="list-style-type: none"> <li>• Investigate the use of pulleys with different weights.</li> <li>• Test different thread strengths.</li> <li>• Investigate the stretching of elastic bands of different thicknesses.</li> <li>• Investigate the best shape for a parachute.</li> </ul>
	Floating and sinking	<ul style="list-style-type: none"> <li>• Test a selection of different liquids for buoyancy.</li> <li>• Test which materials float and sink in water.</li> <li>• Design and make a Plasticine® shape which will float.</li> </ul>
	Friction	<ul style="list-style-type: none"> <li>• Test the speed of movement of a toy car on different surfaces.</li> <li>• Test the speed of movement of a toy car on different slopes.</li> </ul>

## **National unit specification: support notes (cont)**

**UNIT**          Science: Carrying Out Experiments (Access 1)

### **GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT**

#### **Prior Learning**

The unit specification describes the activities which candidates have to undertake to produce evidence of achievement. However, all these activities require prior learning and teaching in order to provide the necessary background knowledge and skills.

Teachers/lecturers should give candidates the opportunity to practise all the skills necessary before assessment, in order for the candidates to have the best chance of being successful in demonstrating the performance criteria.

#### **Safety**

Particular attention should be paid to safe working practices. Time should also be spent ensuring that the candidate is familiar with any apparatus he or she has not used before.

### **GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT**

In order to fulfil criteria for assessment, successful candidate responses are only required on one occasion. Assessment should only be carried out when the teacher/lecturer feels that the candidate has a reasonable chance of success.

Experiments selected for the unit are likely to involve some kind of investigative activity.

The National Assessment Bank Access 2 assessment material provides examples of assessment instruments together with exemplar candidate responses to indicate the level of demand.

Please refer to Guidance on Certification and Moderation given in the Introductory Information of these Arrangements for further details about certification and moderation when Access 1 units are being used to contribute to an Access 2 unit.

### **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).

## National Unit Specification: general information

**UNIT** Science: Handling Information (Access 1)

**NUMBER** D3NJ 07

### SUMMARY

This unit offers the opportunity to explore some applications of science and to develop skills of handling information from a number of different sources.

### OUTCOME

Handle information from a provided source.

### RECOMMENDED ENTRY

Entry is at the discretion of the centre. However, it would be beneficial if a candidate has already been involved in a Science programme, for example, a programme using Access 1 curriculum descriptors.

### CREDIT VALUE

1 credit at Access 1.

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### Administrative Information

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## **National Unit Specification: statement of standards**

### **UNIT**      Science: Handling Information (Access 1)

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**

Handle information from a provided source.

#### **Performance criteria**

- (a) Relevant information is selected and presented.
- (b) Conclusions drawn are valid and explanations given are supported by evidence.

#### **Evidence requirements**

Evidence for PCs (a) and (b) must be generated from three sources of information, each related to a different context. One of these contexts should be from Biology, one from Chemistry and one from Physics. The sources of information could be from speakers, video, papers, posters, books, etc.

Evidence may be verbal or non-verbal and may include one or more of the following: speech, writing, signing, lip-reading, Braille, word-processing, computer assisted communication.

## National Unit Specification: support notes

### UNIT Science: Handling Information (Access 1)

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

This unit is derived from the unit *D04B 08 Science (Access 2)*. Candidates may find this an appropriate unit to undertake on its own, or in conjunction with the other Access 1 unit *D3NH 07: Science: Carrying Out Experiments (Access 1)*.

The possible contexts for this unit are listed below:

<b>Biology</b>	<b>Chemistry</b>	<b>Physics</b>
The Living Body	Fuels	Energy
Plants	Drugs	Forces
The Environment	Matter/Substances	Electricity
Healthy Bodies	Metals	Magnetism
The Animal Kingdom	Clothing, Fibres and Dyes	Light, Colour and Sound
Detergents	Acids and Alkalis	Earth and Space

The table below gives an illustration, for three of the possible contexts, of the kind of topics which could be considered. One of the contexts is from Biology, one from Chemistry and one from Physics. Further exemplification of contexts is given in the Access 2 Cluster for Science. The table also provides some suggested activities involving handling information. However, individual centres are free to choose any of the contexts and to identify other topics and activities within the chosen contexts, as long as one is from Biology, one from Chemistry and one from Physics.

<b>Context (Biology)</b>	<b>Topics</b>	<b>Activities</b>
Plants	Variety of plants	<ul style="list-style-type: none"><li>• Identify plants from leaf shape using a key.</li><li>• Identify plants using a flower key.</li><li>• Find out about uses of plants and their products, e.g. for dyes, medicines and oils.</li></ul>
	Seed biology	<ul style="list-style-type: none"><li>• Find out about the main parts of a seed and their purpose.</li></ul>
	Plant development	<ul style="list-style-type: none"><li>• Find out about the different parts of a plant.</li><li>• Find out about the life cycle of a plant.</li></ul>
	Plant growth	<ul style="list-style-type: none"><li>• Find out from plant care instructions the best conditions for growth for two or three different species of plants.</li></ul>

## National Unit Specification: support notes (cont)

### UNIT Science: Handling Information (Access 1)

Context (Chemistry)	Topics	Activities
Fuels	Fire and fire safety	<ul style="list-style-type: none"> <li>Find out about how to deal with different kinds of fires in the lab and at home – information from fire extinguishers, talk from Fire Service, leaflets, video, etc.</li> </ul>
	Food as fuel	<ul style="list-style-type: none"> <li>Find out about the carbohydrate, fat and energy provided by different foods using labels as a source of information.</li> <li>Find out about the use of high energy foods by e.g. athletes, explorers.</li> </ul>
	Source of fuels	<ul style="list-style-type: none"> <li>Find out where fuels come from – information on gas, coal and other sources, including Scottish Power videos, e.g. Energy For Life, Power Station visit.</li> <li>Find out how coal was formed.</li> <li>Find out about how recycling saves fuel; think about community refuse; visit recycling plant.</li> <li>Find out about alternative uses of waste materials.</li> </ul>

Context (Physics)	Topics	Activities
Forces	Push and pull	<ul style="list-style-type: none"> <li>Find out about the force of gravity on different planets and in space.</li> </ul>
	Floating and sinking	<ul style="list-style-type: none"> <li>Find out which insects are able to walk on water and why.</li> </ul>
	Friction	<ul style="list-style-type: none"> <li>Examine information about stopping distances of cars.</li> </ul>

## **National Unit Specification: support notes (cont)**

**UNIT**        Science: Handling Information (Access 1)

### **GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT**

#### **Prior Learning**

The unit specification describes the activities which candidates have to undertake to produce evidence of achievement. However, these activities require prior learning and teaching in order to provide the necessary background knowledge and skills.

Teachers/lecturers should give candidates the opportunity to practise all the skills necessary before assessment, in order for the candidates to have the best chance of being successful in demonstrating the performance criteria.

#### **Safety**

Particular attention should be paid to safe working practices. Time should also be spent ensuring that the candidate is familiar with any materials and equipment he or she has not used before.

### **GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT**

In order to fulfil criteria for assessment, successful candidate responses are only required on one occasion. Assessment should only be carried out when the teacher/lecturer feels that the candidate has a reasonable chance of success.

Sources of information for the unit should be straightforward and allow the candidates to select and present information and draw some kind of simple conclusion.

The National Assessment Bank Access 2 assessment material for this unit provides examples of assessment instruments together with exemplar candidate responses to indicate the level of demand.

Please refer to Guidance on Certification and Moderation given in the Introductory Information of these Arrangements for further details about certification and moderation when Access 1 units are being used to contribute to an Access 2 unit.

#### **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).

## National Unit Specification: general information

<b>UNIT</b>	Physics: Carrying Out Practical Experiments (Access 1)
<b>NUMBER</b>	D92M 07

### SUMMARY

This unit provides opportunities to carry out experimental activities in the context of Physics using a basic level of skill, in a supported learning environment. This is linked to the unit Physics: Handling Information (Access 1).

### OUTCOME

Carry out practical experiments.

### RECOMMENDED ENTRY

Entry is at the discretion of the centre.

### CREDIT VALUE

1 credit at Access 1 (6 SCOTCAT points\*) at SCQF level 1.

\*SCOTCAT points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCOTCAT points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.

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## National Unit Specification: statement of standards

### UNIT      Physics: Carrying Out Practical Experiments (Access 1)

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.

The contexts for this unit are:

**Energy**

**Forces**

**Electricity**

**Magnetism**

**Light, Colour and Sound**

**Earth and Space**

### OUTCOME

Carry out practical experiments.

#### Performance criteria

- a) A realistic plan is prepared.
- b) Participation in the experiment is active.
- c) The procedures are followed safely and according to the plan.
- d) Relevant measurements or observations are recorded in an appropriate format.
- e) The experiment is reviewed and evaluated.

#### Evidence requirements

The candidate should be allowed to provide evidence by the use of his or her normal mode of communication which may be verbal or non-verbal and may include one or more of the following: speech, writing, word processing, signing, lip-reading, Braille or computer-assisted communication.

Candidates are required to be involved in three experiments made up of one from each of three different contexts.

PC (a)	The plan should include: <ul style="list-style-type: none"><li>• aim and main features of the experiment</li><li>• outline of three to five simple steps</li><li>• familiar equipment and materials selected for the experiment</li></ul>
PCs (b) and (c)	Performance evidence of safe and active participation in the planned experiment may be recorded using an observation checklist.
PCs (d) and (e)	A record of the results/observations and a statement about the strengths or weaknesses of the experiment. At least two points should be identified by the candidate.

## National Unit Specification: support notes

### UNIT            Physics: Carrying Out Practical Experiments (Access 1)

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

While the exact 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

This is one of two units derived from the Science Unit D04P 08 Physics (Access 2). Candidates may find this as an appropriate unit to undertake on its own or in conjunction with the other Access 1 Unit D92N 07 Physics: Handling Information.

The table below gives an illustration, for each of the specified contexts, of the kind of topics which could be considered. It also provides some suggested activities for experimental activities. However, individual centres are free to choose any of the specified contexts and to identify other topics and activities within the chosen contexts.

Context	Topics	Experimental Activities
<b>Energy</b>	Sources and use of energy	<ul style="list-style-type: none"> <li>• Use a solar-powered sensor to measure solar energy in different locations</li> <li>• Investigate the effect of altering the number of panels and the angle of panels</li> </ul>
	Energy changers	<ul style="list-style-type: none"> <li>• Operate various appliances and identify energy changes, for example, model steam engine, electricity generators</li> <li>• Build an elastic band roller or projectile launcher and investigate the effect of increasing the number of winds/length of elastic</li> <li>• Investigate the effect of changing the number of winds on the distance travelled by a wind-up toy</li> <li>• Investigate the effect of changing the number of panels/angle of panel, on solar power output</li> </ul>
	Heat energy	<ul style="list-style-type: none"> <li>• Investigate the effect of heat energy on solids, for example, bi-metallic strip; metal ball and holder</li> <li>• Investigate effect of heat energy on liquids – boiling/evaporation rates for different liquids</li> <li>• Investigate effect of heat on gases – make a hot air balloon using kit</li> <li>• Test the thermal conductivity of different metals</li> <li>• Test materials for best insulator</li> </ul>

## National Unit Specification: support notes (cont)

### UNIT Physics: Carrying Out Practical Experiments (Access 1)

Context	Topics	Experimental Activities
<b>Forces</b>	Push and pull	<ul style="list-style-type: none"> <li>Investigate the use of pulleys with different weights</li> <li>Test different thread strengths</li> <li>Investigate the stretching of elastic bands of different thickness</li> <li>Investigate the best shape for a parachute</li> </ul>
	Floating and sinking	<ul style="list-style-type: none"> <li>Test a selection of different liquids for buoyancy</li> <li>Test which materials float and sink in water</li> <li>Design and make a Plasticine ® shape which will float</li> </ul>
	Friction	<ul style="list-style-type: none"> <li>Test the speed of movement of toy car on different surfaces</li> <li>Test the speed of movement of toy car on different slopes</li> </ul>
<b>Electricity</b>	Static electricity	<ul style="list-style-type: none"> <li>Test materials for static – for example, ability to pick up pieces of paper after rubbing</li> <li>Test different materials for producing static by rubbing plastic</li> <li>Investigate which materials retain static charge over time</li> </ul>
	Batteries	<ul style="list-style-type: none"> <li>Make a battery and investigate using different materials</li> </ul>
	Simple circuits	<ul style="list-style-type: none"> <li>Build a simple circuit which includes a bulb, a meter and a battery and:               <ul style="list-style-type: none"> <li>test the effect of including more than one bulb or</li> <li>test the effect of including different types of bulb or</li> <li>test different materials to see if they conduct</li> </ul> </li> <li>Design and build a hoop and wire game</li> </ul>

## National Unit Specification: support notes (cont)

UNIT Physics: Carrying Out Practical Experiments (Access 1)

Context	Topics	Experimental Activities
<b>Light, Colour and Sound</b>	Light	<ul style="list-style-type: none"> <li>Investigate refraction of light through water/glass/Perspex using various shapes of block (for example, cube, pyramid)</li> <li>Investigate the effect of converging and diverging lenses on parallel rays of light</li> </ul>
	Colour	<ul style="list-style-type: none"> <li>Investigate the splitting of white light into a spectrum using a prism and a light source (for example, a ray box or torch)</li> <li>Investigate colour mixing using a light source and colour filters</li> </ul>
	Sound	<ul style="list-style-type: none"> <li>Look at the effect of sound waves on soap film or stretched cling film (movement of soap film, sand or rice on cling film)</li> <li>Investigate pitch and length of vibrating string or column of air (for example, by using a home-made guitar)</li> </ul>
<b>Magnetism</b>	Magnets and their magnetic fields	<ul style="list-style-type: none"> <li>Investigate the attraction of unlike poles and repulsion of like poles using two magnets</li> <li>Using iron filings, investigate the magnetic field around a bar magnet (for example, a pair of magnets with poles placed North to North and a pair of magnets with poles placed North to South)</li> </ul>
	Earth's magnetic field and the compass	<ul style="list-style-type: none"> <li>Make a floating compass with a needle and cork. Investigate the direction it points with a magnet present and without a magnet present</li> </ul>
	Electromagnetism	<ul style="list-style-type: none"> <li>Make an electromagnet by coiling wire around an iron nail and connecting it to an electric circuit. Investigate the effect that number of turns in the coil, size of current flowing, and the presence of an iron core (with or without nail) have on its strength (for example, ability to pick up paper clips)</li> </ul>

## National Unit Specification: support notes (cont)

### UNIT Physics: Carrying Out Practical Experiments (Access 1)

Context	Topics	Experimental Activities
Earth and Space	Earth, sun and moon	<ul style="list-style-type: none"><li>Investigate the factors affecting the size and shape of craters on the moon (for example, drop different size marbles into a tray of sand)</li></ul>
	Planets and stars	<ul style="list-style-type: none"><li>Make a telescope using two convex lenses (focal lengths of lenses 5 cms and 25 cms, lenses placed 25 cms apart) and compare the image seen with the original object</li></ul>
	Gravity	<ul style="list-style-type: none"><li>Drop different weights of similar shape from a height and investigate the rate at which they fall</li></ul>

#### **GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT**

The unit specifications describe the activities which candidates have to undertake to produce evidence of achievement. However all these activities require prior learning and teaching in order to provide the necessary background knowledge and skills.

Teachers/lecturers should give candidates the opportunity to practise all the skills necessary before assessment, in order for the candidates to have the best chance of being successful in demonstrating the performance criteria for the outcome.

Particular attention should be paid to safe working practices. Time should also be spent ensuring that the candidate is familiar with any apparatus he/she has not used before.

#### **GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT**

In order to fulfil criteria for assessment, successful candidate responses are only required on one occasion. Assessment should only be carried out when the teacher/lecturer feels that the candidate has a reasonable chance of success.

Selected experiments are likely to involve some kind of investigative activity.

A record of the candidate's responses should be kept for moderation purposes. This record could be a candidate's written or spoken response. Alternatively, the teacher/lecturer may record the candidate's responses. In this situation, the teacher/lecturer should authenticate the record by attaching a signed and dated statement that this is an accurate record of the evidence produced by the named candidate.

## **National Unit Specification: support notes (cont)**

**UNIT**            Physics: Carrying Out Practical Experiments (Access 1)

### **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 special alternative outcomes for units. For information on these, please refer to the SQA document *Guidance on Special Assessment Arrangements* (SQA, 2001).

## National Unit Specification: general information

**UNIT** Physics: Handling Information (Access 1)

**NUMBER** D92N 07

### SUMMARY

This unit provides opportunities to handle basic information in the context of Physics in a supported learning environment. This unit is linked to the unit Physics: Carrying Out Practical Experiments (Access 1).

### OUTCOME

Handle information from a provided source.

### RECOMMENDED ENTRY

Entry is at the discretion of the centre.

### CREDIT VALUE

1 credit at Access 1 (6 SCOTCAT points\*) at SCQF level 1.

\*SCOTCAT points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCOTCAT points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.

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## Administrative Information

**Superclass:** RC

**Publication date:** September 2003

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**Version:** 02

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## National Unit Specification: statement of standards

### UNIT      Physics: Handling Information (Access 1)

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.

The contexts for this unit are:

**Energy**

**Forces**

**Electricity**

**Magnetism**

**Light, Colour and Sound**

**Earth and Space**

### OUTCOME

Handle information from a provided source.

### Performance criteria

- a) Relevant information is selected and presented.
- b) Conclusions drawn are valid and explanations given are supported by evidence.

### Evidence requirements

The candidate should be allowed to provide evidence by the use of his or her normal mode of communication which may be verbal or non-verbal and may include one or more of the following: speech, writing, word processing, signing, lip-reading, Braille or computer-assisted communication.

Evidence for PCs (a) and (b) must be generated from three sources of information, each related to a different context. The sources of information could be from speakers, video, papers, posters, books etc.

## National Unit Specification: support notes

### UNIT      Physics: Handling Information (Access 1)

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

While the exact 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

This is one of the two units derived from the Science Unit D04P 08 Physics (Access 2). Candidates may find this an appropriate unit to undertake on its own or in conjunction with the other Access 1 Unit D92M 07 Physics: Carrying Out Practical Experiments.

The table below gives an illustration for each of the specified contexts, of the kind of topics which could be considered. It also provides some suggested activities for handling information. However, individual centres are free to choose any of the specified contexts and to identify other topics and activities within the chosen contexts.

Content	Topics	Information Handling Activities
<b>Energy</b>	Sources and use of energy	<ul style="list-style-type: none"><li>• Do a survey to find which sources of energy we use to heat our homes</li><li>• Find out about renewable and non-renewable energy sources</li></ul>
	Energy changers	<ul style="list-style-type: none"><li>• Use food packet labels to find energy content of different food types and compare</li></ul>
	Heat energy	<ul style="list-style-type: none"><li>• Find out about some different ways of saving heat loss from houses</li><li>• Find out about percentage energy saved by using different forms of house insulation</li><li>• Find out about the different cooking times needed for a range of foods by examining information from food packages</li></ul>

## National Unit Specification: support notes (cont)

### UNIT Physics: Handling Information (Access 1)

Content	Topics	Information Handling Activities
<b>Forces</b>	Push and pull	<ul style="list-style-type: none"> <li>Find out about the force of gravity on different planets and in space</li> </ul>
	Floating and sinking	<ul style="list-style-type: none"> <li>Find out which insects are able to walk on water and why</li> </ul>
	Friction	<ul style="list-style-type: none"> <li>Examine information about stopping distances of cars</li> </ul>
<b>Electricity</b>	Static electricity	<ul style="list-style-type: none"> <li>Find out about an example of naturally occurring static electricity, for example, lightning</li> <li>Find out about uses of static electricity, for example, in photocopiers, air cleaners</li> </ul>
	Batteries	<ul style="list-style-type: none"> <li>Find out about advantages and disadvantages of re-chargeable batteries</li> <li>Examine a range of different batteries and find out what might influence the size of the voltage</li> </ul>
	Safety	<ul style="list-style-type: none"> <li>Find out about dangers related to electricity in the home and identify dangerous situations from illustrations</li> <li>Find out why some circuits include a fuse</li> </ul>

## National Unit Specification: support notes (cont)

### UNIT Physics: Handling Information (Access 1)

Content	Topics	Information Handling Activities
<b>Light, Colour and Sound</b>	Light	<ul style="list-style-type: none"> <li>Find out how we see the world around us – reflection of light from objects, function of parts of the eye (for example, lens, retina)</li> </ul>
	Colour	<ul style="list-style-type: none"> <li>Find out how rainbows are produced</li> <li>Find out about colour blindness</li> </ul>
	Sound	<ul style="list-style-type: none"> <li>Find out how we hear – sound as vibration, function of parts of the ear (for example, sound causes ear drum to vibrate)</li> </ul>
<b>Magnetism</b>	Magnets and their magnetic fields	<ul style="list-style-type: none"> <li>Find out about the materials used to make magnets (for example, iron, nickel) and the materials they attract</li> </ul>
	Earth's magnetic field and the compass	<ul style="list-style-type: none"> <li>Find out about the Earth's magnetic field, and the use of the compass</li> </ul>
	Electromagnetism	<ul style="list-style-type: none"> <li>Find out about the uses of electromagnets in everyday life (doorbell, loudspeaker, TV)</li> </ul>

## National Unit Specification: support notes (cont)

### UNIT Physics: Handling Information (Access 1)

Content	Topics	Information Handling Activities
<b>Earth and Space</b>	Earth, sun and moon	<ul style="list-style-type: none"><li>• Find out why we get day and night, the year and seasons</li><li>• Find out about the phases of the moon throughout its cycle</li><li>• Find out how eclipses happen</li></ul>
	Planets and stars	<ul style="list-style-type: none"><li>• Find out about the planets in our solar system, stars and constellations</li><li>• Find out what stars are and about the length of time it takes for light from stars to travel to Earth</li></ul>
	Gravity	<ul style="list-style-type: none"><li>• Find out about gravity and the movement of planets, moons and satellites</li></ul>

#### **GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT**

The unit specifications describe the activities which candidates have to undertake to produce evidence of achievement. However, all these activities require prior learning and teaching in order to provide the necessary background knowledge and skills.

Teachers/lecturers should give candidates the opportunity to practise all the skills necessary before assessment, in order for the candidates to have the best chance of being successful in demonstrating the performance criteria for the outcome.

#### **GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT**

In order to fulfil criteria for assessment, successful candidate responses are only required on one occasion. Assessment should only be carried out when the teacher/lecturer feels that the candidate has a reasonable chance of success.

Sources of information for the Outcome should be straightforward and allow candidates to select and present information and draw some kind of simple conclusion.

A record of the candidate's responses should be kept for moderation purposes. This record could be a candidate's written or spoken response. Alternatively, the teacher/lecturer may record the candidate's responses. In this situation, the teacher/lecturer should authenticate the record by attaching a signed and dated statement that this is an accurate record of the evidence produced by the named candidate.

## **National Unit Specification: support notes (cont)**

**UNIT**      Physics: Handling Information (Access 1)

### **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 special alternative outcomes for units. For information on these, please refer to the SQA document *Guidance on Special Assessment Arrangements* (SQA, 2001).