

-SQA- SCOTTISH QUALIFICATIONS AUTHORITY

Hanover House
24 Douglas Street
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NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number-	3161011	-Session-	1991-92
-Superclass-	RA		

-Title-	MEASURING AND RECORDING IN SCIENCE (x¹/₂)
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-DESCRIPTION-

Purpose	This module is designed to enable the student to develop skills in measuring and recording in a practical science context. The module does not assume any scientific background.
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The module could be done in conjunction with 3161001 Introducing Science.

Preferred Entry Level	No formal entry requirements.
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Outcomes	The student should: 1. identify simple measuring instruments and appropriate units; 2. make and record accurate measurements using a range of instruments.
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Assessment Procedures	Acceptable performance in the module will be satisfactory achievement of all the Performance Criteria specified for each Outcome.
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The following abbreviations are used below:

IA Instrument of Assessment
PC Performance Criteria

Note: The Outcomes and PCs are mandatory and cannot be altered. The IA may be altered by arrangement with SQA. (Where a range of performance is indicated, this should be regarded as an extension of the PCs and is therefore mandatory.)

OUTCOME 1 IDENTIFY SIMPLE MEASURING INSTRUMENTS AND APPROPRIATE UNITS

- PCs (a) The identification of the instrument from a given range is appropriate to a specified measurement task.
(b) The identification of the unit is appropriate for the quantity to be measured.

IA Matching Exercises

8 matching exercises to assess the student's ability to identify appropriate measuring instruments and units for given measurement tasks.

The student will be required to match instruments to each of the following measurement tasks:

- (i) 1 measurement of time;
- (ii) 1 measurement of temperature;
- (iii) 2 measurements of volume;
- (iv) 2 measurements of mass;
- (v) 2 measurements of length.

The tasks specified should be varied with respect to the requirements for accuracy and the dimensions and magnitude of the measurement.

For each of the exercises the student will be required to select an appropriate instrument from three given types of instruments (the instruments will be appropriate to the variable to be measured) and specify the most appropriate unit. The selection of instruments could be made on the basis of real examples or pictures/diagrams etc.

Satisfactory achievement of the Outcome will be demonstrated by the student achieving both Performance Criteria for each of the matching exercises.

OUTCOME 2 MAKE AND RECORD ACCURATE MEASUREMENTS USING A RANGE OF INSTRUMENTS

- PCs (a) The setting up of a measuring instrument is correct with respect to location, safety and zeroing.
(b) The reading of measurements from a digital scale is accurate.
(c) The reading of measurements from an analogue scale is accurate to the nearest division.
(d) The record of the measurements is correct with respect to the value and the unit.

IA Practical Exercises

16 practical exercises to assess the student's ability to make and record accurate measurements using a range of measuring instruments.

The student will be required to carry out the following practical exercises:

- (i) 6 measurement tasks using specified digital instruments, including at least one task relating to each of the following variables: time, mass and temperature;
- (ii) 10 measurement tasks using specified analogue instruments including at least one task relating to each of the following variables: time, mass, temperature, length and volume.

For each exercise the student will be required to set up the instrument and record the measurements on a given pro forma.

A checklist should be devised to ensure a reliable interpretation of the student's practical performance.

Satisfactory achievement of the Outcome will be demonstrated by the student achieving the Performance Criteria for each of the practical exercises.

**The following sections of the descriptor are offered as guidance.
They are not mandatory.**

CONTENT/CONTEXT

Corresponding to Outcomes 1-2:

The following range of measuring instruments would be appropriate for both Outcomes 1 and 2:

- (i) time: clock, stop watch/clock - digital and analogue;
 - (ii) mass: spring balance, digital balance, analogue balance, kitchen/bathroom scales;
 - (iii) temperature: thermometers with a variety of ranges eg. dial, digital, liquid in glass, liquid crystal;
 - (iv) length: range finder, tape measure, rules of various sizes eg. 15 cm ruler, metre stick;
 - (v) volume: measuring cylinders of various sizes, jugs, laboratory flasks and beakers.
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SUGGESTED LEARNING AND TEACHING APPROACHES

A range of learning and teaching approaches within the student-centred philosophy may be appropriate.

Laboratory practical work will play a significant part in this module. Practical procedures should be approved by the tutor.

Measurement and recording skills can be developed in a context relevant to the interests and needs of the group concerned.

Safety considerations should be observed at all times.

During the work of the module students should have several opportunities to practise their skills. It is recommended that the tutor assesses each student at the stage which he/she is showing consistent competence in a given task. Where a student is unsuccessful in achieving an Outcome, provision should be made for remediation and reassessment.

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