

-SQA- SCOTTISH QUALIFICATIONS AUTHORITY

**Hanover House
24 Douglas Street
GLASGOW G2 7NQ**

NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number- 7180030 **-Session-1990-91**
-Superclass- RB

-Title- DEALING WITH BASIC MEASUREMENTS

-DESCRIPTION-

Purpose This module is designed to develop basic competence in handling instruments and measurements.

Preferred Entry Level 7180010 Using Basic Number Skills

Outcomes The student should:

1. use a variety of measuring instruments;
2. read a scale and report the value to an accuracy appropriate to the instrument used;
3. convert measured units of length, weight, volume and time to units specified in a task;
4. perform calculations to obtain specified quantities from given measurements and information.

Assessment Procedures Acceptable performance in the module will be satisfactory achievement of all the Performance Criteria specified for each Outcome.

The following abbreviations are used below:

PC Performance Criteria
IA Instrument of Assessment

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 USE A VARIETY OF MEASURING INSTRUMENTS

- PCs (a) Selection of instrument is appropriate to the task in terms of type and range.
(b) Procedures for setting up instrument are correct.
(c) Method of use of instrument is correct.

IA Practical Exercise

The student will be required to undertake four Practical Exercises. One exercise will be undertaken for each of length, volume, weight and time.

Satisfactory performance will be that the student fulfils all of the Performance Criteria in each exercise.

OUTCOME 2 READ A SCALE AND REPORT THE VALUE TO AN ACCURACY APPROPRIATE TO THE INSTRUMENT USED

- PCs (a) Main scale divisions are reported correctly.
(b) Intermediate scale divisions are reported correctly.
(c) Main scale and intermediate scale units are reported correctly.
(d) Method of reporting is appropriate to the context.

IA Practical Exercise

The student will be required to undertake five Practical Exercises. One exercise will be undertaken for each of length, volume, weight, time and temperature. At least one exercise will involve a digital display. Reports may be either oral or written.

All of the Performance Criteria will be fulfilled in each exercise.

Satisfactory performance will be achievement of all the Performance Criteria.

OUTCOME 3 CONVERT MEASURED UNITS OF LENGTH, WEIGHT, VOLUME AND TIME TO UNITS SPECIFIED IN A TASK

- PCs (a) Interconversion of units of time is correct.
(b) Interconversion of imperial and metric units is correct.
(c) Interconversion of metric multiples and sub-divisions is correct.

IA Calculation Exercise

The student will be required to undertake Practical Exercises as follows:

- (i) one conversion from hours to minutes and one conversion from minutes to hours.
- (ii) four conversions from imperial to metric, at least one on each of length, volume and weight; four conversions from metric to imperial, at least one on each of length, volume and weight.
- (iii) three conversions using multiples, at least one on each of length, volume and weight; three conversions using sub-divisions, at least one on each of length, volume and weight.

The student will be required in (i) to complete both exercises correctly, (ii) complete 6 out of 8 exercises correctly and (iii) complete 4 out of 6 exercises correctly. Use of tables and calculators is strongly recommended.

Satisfactory performance will be achievement of all the Performance Criteria.

OUTCOME 4**PERFORM CALCULATIONS TO OBTAIN SPECIFIED QUANTITIES FROM GIVEN MEASUREMENTS AND INFORMATION**

PCs

- (a) Calculation of perimeter is correct.
- (b) Calculation of area is correct.
- (c) Calculation of volume is correct.
- (d) Calculation of fractional amount from a total is correct.
- (e) Totalling items from "batch" quantities is correct.

IA Calculation Exercise

The student will undertake nine Calculation Exercises. All numerical values should be whole numbers of no more than two digits. Each calculation will involve at least one two digit number. All dimensions for one object should be stated in the same unit. Final answers should contain no more than five digits.

Exercises will be allocated as follows:

- PC (a) 2 exercises involving rectangular shapes, one to include a rectangular recess.
- (b) 2 exercises involving rectangular shapes, one of which consists of a simple rectangle, the other being a rectangle with a smaller rectangle added on.
- (c) 1 exercise involving a cuboid volume.

- (d) 2 exercises.
- (e) 2 exercises.

The student will complete all exercises correctly.

Satisfactory performance will be achievement of all the Performance Criteria.

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

CONTENT/CONTEXT

Use of calculators is strongly recommended in this module.

Corresponding to Outcomes 1-4:

Contexts chosen should be related to the interests of the students. Use of tables, charts and calculators is strongly recommended.

1. Instruments may be selected from calliper, footrules, metre sticks, tapes, calibrated containers, stopwatch, clocks, baking scales, weighing scales, thermometers.

Consideration should be given to factors such as:

Ensuring that instruments are correctly zeroed before use or that containers for measuring volume are dried and clean. Ensuring that the correct mode of a stopwatch is selected and that tapes and rulers have one end "zeroed".

2. Exercises may be a continuation of those undertaken for Outcome 1.

Measured values need only be recorded as whole numbers with the appropriate unit eg. 6 metres 40cm, 3Kg 40g. There is no requirement to state values as 6.4 metres, but this should not be discouraged.

3. Conversions could include - inches to centimetres (answers can be expressed in metres and centimetres or decimal fractions of a metre and for inverse calculation answer stated in inches or feet and inches) litres-gallons, miles-kilometres, lbs-kilograms, ounces-grammes, centigrade-fahrenheit.

Conversions could include - grammes-kilogramme, metres-kilometres, metres-millimetres litres-millilitres, metres-centimetres, centimetres-millimetres, litres-cubic metres.

4. In (a), (b) and (c), the calculation of perimeter, area and volume could be carried out on measurements obtained by the student. The perimeter, floor area and volume of air in a room could be calculated from measurements made by the student of length, breadth and height. While practice exercises are necessary, motivation will be through contexts which are relevant to the student. In (d), the context could be the weight of one ingredient of a mixture where the fraction of the total weight is given.

In (e) the context could be the totalling of items which are presented in different batch sizes eg. 6 boxes of 500 + 2 boxes of 100 + 70 single items.

The items can either be visible to enable batch size to be determined or with batch size clearly printed in container holding items.

SUGGESTED LEARNING AND TEACHING APPROACHES

This module should be based around practical measurement activities with conversions and calculations being seen as an integral part.

The activities selected should give the student the opportunity of using a wide variety of instruments in situations which are related to his/her interests and work experience.

Instruction sheets, worksheets and checklists should be available to accommodate the different instruments, with paper-based scale reading exercises being available for practice.

OHP transparencies, videos and computer programmes are also recommended.

Conversion charts and tables should be used extensively and the use of calculators is strongly recommended.

Learning and teaching approaches could include individual/small group work, discussion and participation in real life situations wherever possible.

The student should be encouraged to maintain a folio/log of completed work in which a record is kept of measurements taken and calculations performed.

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