

Systems and Technology GA 2: School-assessed Task

GENERAL COMMENTS

The 2001 Systems and Technology School-assessed Task (Units 3 and 4 Outcome 2) involved students in designing, planning, producing, testing and evaluating activities related to the operation and control of an integrated system or systems.

The School-assessed Task involves the following:

- developing a design and production plan
- establishing criteria for evaluating the product
- implementing the plan (production work)
- diagnostic testing and analysing testing data
- maintaining a record or log of progress during production
- evaluating the system and production activities.

Advice on management and organisation

Conditions which are conducive to student achievement in the School-assessed Task include well-managed, organised classrooms/workshop areas and provision of a range of relevant resources.

Teachers need to provide guidelines on the selection of appropriate tasks, timelines, due dates and the requirements of the task. Regular monitoring of progress is also important in supporting and encouraging students through their tasks. Planning and preparation of good interim reports helps students to remain focused on their work throughout the duration of the task.

Features of successful production work

A wide range of topics was explored in the School-assessed Task. Most students are likely to have negotiated production topics with their teacher. They organised their work plans, work processes and set goals for completion and evaluation.

Successful student work exhibited the following features:

- the production task was completed using a diverse range of work processes requiring a reasonable to a high degree of skill and knowledge
- the design plan was thorough and detailed in depth and content
- the plan identified the working operation of the produced system as the goal of the activity
- the production activities involved work on the components and subsystems which control the inputs, processes and outputs of the produced system
- the production activity involved working with an integrated system. The completed system was operational and produced to a very high standard.

Type of products

Examples of successful products students selected for the School-assessed Task were:

- manufacturing moving toys and games
- making controlled robot arms
- building engine powered scooters, go-karts and mini bikes
- making controlled model houses, production lines and playground equipment
- manufacturing a model boat, car or aircraft
- vehicle engine conversions
- making musical instruments
- manufacturing and fitting to cars; engine tachometers, anti-theft devices and locking systems
- wiring and setting of ignition and fuel systems on operating car engines
- manufacturing light and sound display devices.

Areas of strength and weakness

An increasing number of production tasks were of a high standard which reflected the emphasis on quality practical work. With few exceptions the products were integrated systems characterised by 'input-process-output and control' of electrical, electronic and mechanical subsystems.

Teachers and students should note:

- Most of the projects incorporated control of integrated systems. Successful student production activities involved work on integrated systems with the activities involving processes such as

manufacture, repair, modification and assembly of elements and subsystems of controlled operating systems.

- High level evaluation responses involved students commenting on and evaluating their production outcome by comparing the production plan intentions with the actual outcomes of the production work plans, processes, modifications and difficulties encountered. Interim reports were featured in good folios.
- Technical data (sometimes obtained from the diagnostic test) was often used to prove that the production activity was performing as planned or modified.
- Students who produced production plans of limited detail were often disadvantaged as they had little documentation to refer to when assessing and evaluating their work and related planning activities.
- Some production activities were not integrated systems. These products were generally very simple and did not contain a sufficient range of processes with some level of difficulty to achieve high grades.
- Some tasks did not involve the control of a system as required for this task. As advised in the Technology Assessment Guide the Unit 4 production work should result in an operational integrated and controlled system.
- Using commercially produced kits can disadvantage students as they limit planning and production activities. Kits should only be used as a subsystem of a larger integrated system.
- Some tasks contained only mechanical elements and subsystems. These tasks did not meet the need for the production to be an 'integrated system'. All mechanically based activities must have an electrical or electronic subsystem involved in the production.
- Some production activities incorporated the use of 240-volt power supply which contravenes current school practices. A number of these products contained wiring faults such as bare connections or shortened earth wires. A number of schools organised students to produce the same product. Many of these products were too basic (e.g. servicing a lawn mower or assembling a basic kit model).

Diagnostic practice

Teachers should note that testing can be done at any relevant stage of production, with final testing on completion of the system. Diagnostic testing directly relates to the production activity. It involves using test or measuring equipment to assess the performance of a system and its parts in terms of input–process–output and effective control. The information obtained may be used to gain a greater understanding of the system, rectify problems or to measure its performance as planned and to prescribed recognised standards.

Tests were usually performed:

- at the beginning of the task, in order to determine faults
- during their production task, as a means of testing a subsystem
- in most cases, at the end of the production activity to determine the outcome and the operation of the system.

SPECIFIC COMMENTS

Criterion 1 Skill in developing a design plan

High quality work involved the production of a thorough design and planning folio. Students used a range of methods to communicate their ideas and plans including text, graphs, CAD, video, illustrations, CD-ROM, posters.

Criterion 2 Skill in establishing criteria for evaluating the product

Successful developmental work was based upon the selection and justification of preferred options. The evaluation criteria developed was usually detailed and related to the project brief and specifications.

Criterion 3 Skill in preparing a production plan

Most students prepared a detailed plan for production that included equipment and components needed for the task. Successful plans outlined in detail stages involved in production work.