PROVINCE OF THE EASTERN CAPE

DEPARTMENT OF EDUCATION

AGRICULTURAL TECHNOLOGY

2007

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PRACTICAL ASSESSMENT TASKS FOR AGRICULTURAL TECHNOLOGY

INTRODUCTION

Introduction

The 17 National Curriculum Statement subjects which contain a practical component all include a PAT, i.e. a Practical or Performance Assessment Task. These subjects are:

- AGRICULTURE: Agricultural Management Sciences, Agricultural Technology
- ARTS: Dance Studies, Design, Dramatic Arts, Music, Visual Arts
- HSS: Life Orientation
- SCIENCES: Computer Applications Technology, Information Technology
- SERVICES: Consumer Studies, Hospitality Studies, Tourism
- TECHNOLOGY: Civil Technology, Electrical Technology, Engineering Graphics and Design, Mechanical Technology

A PAT allows the teacher to directly and systematically observe applied competence. The PAT comprises the application/performance of the knowledge, skills and values particular to that subject and counts 25% (i.e. 100 marks) of the total promotion/ certification mark out of 400 for the subject. In the two Arts subjects Design and Visual Arts, the PAT counts 37.5% (i.e. 150 marks) of the total promotion/ certification mark out of 400 for the subject.

The PAT is implemented across the first three terms of the school year and should be undertaken as one extended task, which is broken down into different phases or a series of smaller activities that make up the PAT. The planning and execution of the PAT differs from subject to subject.

TEACHER GUIDE
The Practical Assessment Task for Agricultural Technology

Schools will be informed of the list of projects at the beginning of the first term of each academic year. Schools will choose one option from given choices.

The Practical Assessment Task comprises a design project, which leads to the design and development of products. This task should take the form of problem solving and realisation (making) and should be completed in the first three terms and handed in by the end of the third term. The task should have utilitarian value and must be based on real-life situations, for example the construction of a gas braai, a trough for animals to drink from, etc. The learners should know the assessment criteria before they start with the task.

The Practical Assessment Task in Grade 12 is **externally** set and moderated, but internally assessed. The project is completed under controlled conditions and is assessed by means of a rubric. The PAT counts 25% of the total promotion mark in grade 12.

The Practical Assessment Task counts 100 marks and consists of a design portfolio (50 marks) and the final product (50 marks). The Practical Assessment Task therefore focuses on the development of the design portfolio as well as the product.

The Design Portfolio

The **design portfolio** should include evidence of how the development of the product was approached, that is:

- The planning process;
- The knowledge and skills accumulated in the process;
- The technological process followed;
- The materials used;
- The safety and environmental aspects considered;
- The calculations used – if applicable, sketches or diagrams;
- The starting time and ending time – how long it took to complete from start to finish;
- The investigations or research undertaken, and
- Any other information that is relevant to the project.

The design project should be completed over the following two phases:

Phase 1: Learners must identify the problem or need in their chosen project, investigate the project, generate ideas and arrive at possible design solutions to make or produce , evaluate and communicate the solution to the problem or need. The evidence of this phase will be located in the design portfolio and this phase will be undertaken during term 1 and the start of term 2.

Phase 2: Learners develop the actual product or artefact at the start of the second term and finalise it by the end of term 3. If the design solution does not lend itself to a full-scale artefact, a scaled model or a representation can be produced. However, in the latter instance, the learner is expected to provide full-size sections showing construction details including relevant surface finishing. A model can indicate the context in which the product is to be used.

Note: Learners submit the product or artefact for assessment by the end of the third term. The accompanying planning done in phase 1 (design portfolio) must also be submitted for assessment at this time.

The product that learners are required to construct is a workbench for the Farm.
Resources required for this project are:
Square tubing, 25mm, and seven lengths of 2.1 m
- Mild steel plate, 6mm, one sheet I m x 2m
- Chipboard, 19mm, one sheet, 600mm x I 220mm and
  One sheet, 150mm x I 220mm
- Wood screws, 35 of 40mm, No 8, round head
- Plugs, four to fit 25mm square tubing
- Welding kit with correct consumables
- Correct safety clothing and equipment

The criteria for assessing the Design Portfolio (**50 marks**) are:
- Analysis of problem
- Interrelationship between technology, society and the environment.
- Ability to generate ideas
- Providing a solution (considering IKS and sketching)
- Sketching
- Materials, tools & equipment
- General safety
- Cost calculations

The criteria for assessing the manufacturing of the product (**25 marks**) are:
- Safe handling of tools/equipment (face moderation)
- Skills relating to handling of tools and equipment
- Knowledge of materials
- Process Techniques
- Skills used in process

The criteria for assessing the quality of the product (**25 marks**) are:
- Addresses the problem/need
- Appearance: dimensions and/or finishing off
- Calculations/calibrations
- Appreciation and conclusion by learner
- Time management
- Communication
- Portfolio presentation

Learner Task

Introduction: The product that learners will construct is a workbench that will be utilised for various work that will be undertaken on the farm. The learners utilise their skills and knowledge in Agricultural Technology to engage in this project.

Kindly note that the Design portfolio will be done in term 1 and term 2

The Design Portfolio (50 marks)

The **design portfolio** should include evidence of how the development of the product was approached, that is:

- The planning process; how the given problem was identified
- The knowledge and skills accumulated in the process; demonstrate the skills used in constructing the product
- The technological process followed; how effective was the process
- The materials used.
- The safety and environmental aspects considered; show awareness and knowledge of safety regulations to deliver the product
- The calculations used – if applicable, sketches or diagrams; provide different sketches as part of the solution
- The starting time and ending time – how long it took to complete from start to finish;
- The investigations or research undertaken (need to give details of all resources used including web sites, etc), and
- Any other information that is relevant to the project.

At the beginning of term 2, learners will construct a workbench for the farm.

Construction

The criteria for assessing the manufacturing of the product (**25 marks**) are:

- Safe handling of tools/equipment (face moderation)-demonstrates sufficient knowledge and awareness of all applicable safety measures and preventative measures.
- Skills relating to handling of tools and equipment-demonstrate knowledge and skills related to maintenance and use of tools and equipment.
- Knowledge of materials-knowledge of materials and their properties, concepts and principles to solve problems.
- Process Techniques-knowledge of correctly selected and applied techniques considering possible constraints
- Skills used in process-demonstrate sufficient knowledge of skills needed and considering relevant constraints.

Quality

The criteria for assessing the quality of the product (**25 marks**) are:

- Addresses the problem/need-the product fulfils the purpose for which it was designed and shows innovation that is appropriate to the problem.
- Appearance: dimensions and/or finishing off-product's appearance is very acceptable and shows innovation.
- Calculations/calibrations-evidence of calculations to render product operational.

- Appreciation and conclusion by learner-the product is complete and operates very well.
- Time management-how you have managed time.
- Communication-attention must be given to various communication techniques.
- Portfolio presentation-portfolio must show creativity.

Project 1 - A Workbench

- Square tubing, 25mm, seven lengths of2.1 m
- Mild steel plate, 6mm. one sheet I m x 2m
- Chipboard, 19mm, one sheet, 600mm x I 220mm and one sheet, 150mm x I 220mm
- Wood screws, 35 of 40mm, No 8, round head
- Plugs, four to fit 25mm square tubing
- Welding kit with correct consumables
- Correct safety clothing and equipment

The process:Getting it together:

Step I

- Place the steel sheet on a flat concrete floor and draw the end view of the table with chalk.
.. The drawing must be full size; check that it is square.
- Lay the tubing on the drawing and mark and cut it, using angle cuts of 45 degrees for the corners and braces.
- Place the cut pieces back on the drawing and make sure that the pieces fit together without any gaps.
- Use magnets to hold the pieces together at the joints.
- Tackweld every joint, check for square and remove the work from the drawing.
- Complete each weld, working at 45 degrees as explained.
- Dress and clean the welds.

Step 2

- Repeat the procedure to make the second table end

Step 3

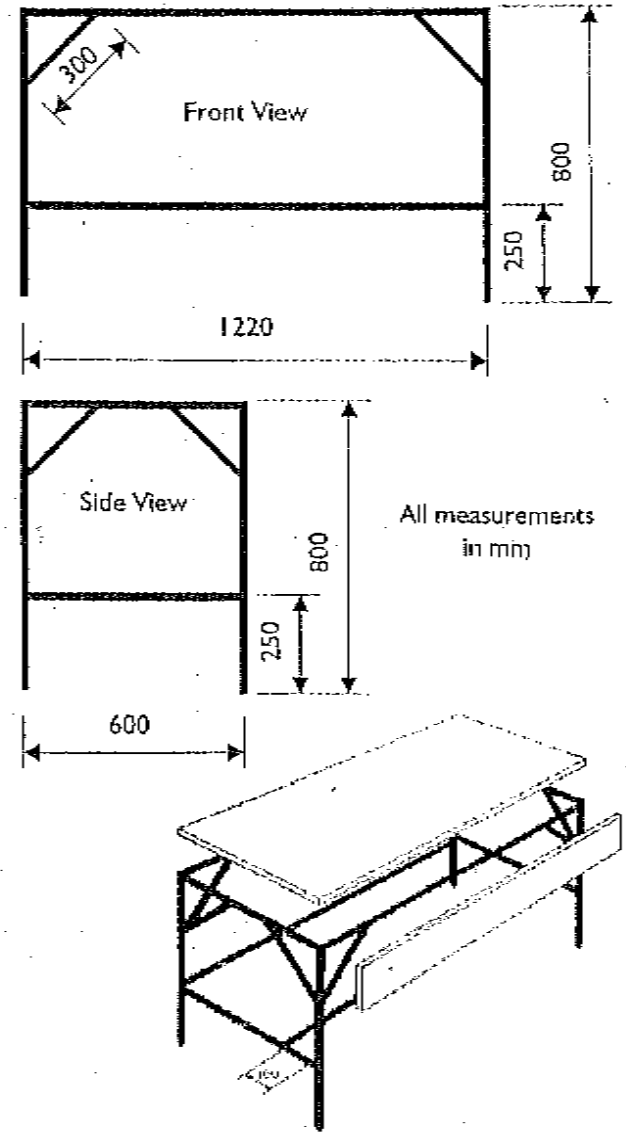
- Cut two lengths of tubing to 1170mm each, with square-cut ends.
- Lay them on the steel plate.
- Cut four lengths of tubing each of 300mm, with the cuts at 45 degrees.
- Stand the two table ends on the steel plate (as per diagram), holding them in position with magnets and place the four braces in position with the help of magnets.
- Tack weld every joint, check for square and complete all the welds.
- Dress and clean the welds.

Step 4

-. Cut two more lengths of tubing of II 70mmeach and hold them in place (as per diagram) with magnets.
- Tack weld each joint, check for square and complete the' welds, working at an angle of 45 degrees .
- Dress and clean each weld.

Step 5

- Drill all the screw holes and then coat the frame work with primer.
- When the primer is dry, apply two finishing coats of paint and insert the plugs in the bottom of the legs.
- Screw the chipboard into position.



EXAMPLE OF AN ASSESSMENT RUBRIC FOR PRACTICAL TASKS AND THE PRACTICAL ASSESSMENT TASK

Name of Candidate: _____ School: _____

Grade: _____ Date: _____

DESIGN PORTFOLIO	MANUFACTURING PROCESS	QUALITY OF PRODUCT	TOTAL	NAME OF ASSESSOR
/50	/25	/25	/100	

A. RUBRIC FOR ASSESSMENT OF THE DESIGN PORTFOLIO

PLANNING

CRITERIA	1	2	3	4	5
Planning Skills: Analysis (diagnosis)	Shows no attempt to identify and collect information to analyse the given problem or need.	Shows an attempt to identify and collect relevant information to analyse the given problem or need.	Identifies the given problem correctly and collects relevant information to analyse the problem or need.	Analyses the given problem correctly and shows evidence of the use from a range of information to understand the problem or need.	Identifies the given problem correctly and uses a variety of investigated strategies to obtain relevant information that assisted in developing and design of innovative ideas.
Interrelationship between technology, society & environment	Makes no attempt to consider the interrelationship.	Awareness of the interrelationship was demonstrated.	Awareness and knowledge of interrelationship was demonstrated.	Application and knowledge of interrelationship aspects.	Application and knowledge of interrelationship aspects considering preventative measures.
Generate ideas	Mentions some ideas.	Shows some awareness of existing ideas as choices.	Offers some existing alternative ideas with a limited reasoning of choice.	Uses original and creative ideas and chooses the most suitable option.	Generates an excellent variety of alternative and innovative ideas. The preferred option is well justified with clear. links to the design.

Solution (considering IKS and sketching)	Attempts to come up with limited design sketches, some specifications and constraints relating to the given problem.	Attempts to come up with design sketches, specifications and constraints relating to the given problem.	Provides design sketches and a variety of specifications and constraints relating to the given problem.	Provides excellent design sketches and a list of relevant specifications and constraints to the given problem.	Provides excellent innovative design sketches that is extremely well formulated and defines the need according to the given problem.
Sketching	Provides irrelevant sketches that demonstrate limited drawing skills.	Provides some relevant sketches with incorrect lines and/or wrong symbols.	Provides relevant sketches with correct lines and symbols.	Provides sketches with correct lines and symbols and related to the given problem.	Provides excellent sketches according to the given problem considering possible solutions.
Material, tools & equipment list	Attempts to list some material, tools & equipment.	Provides a list of material, tools and equipment incorrect or insufficient.	Provides a list of relevant material, tools and equipment.	Provides a list with a variety of relevant material, tools and equipment needed.	Provides a list of the most relevant material, tools and equipment needed in a creative format.
General Safety	Attempts to consider Safety Regulations.	Shows some awareness of Safety Regulations.	Shows awareness, knowledge and application of Safety Regulations.	Shows awareness, knowledge and application of Safety Regulations regarding a variety of conditions.	Shows awareness, knowledge and application of Safety Regulations regarding all conditions and considers preventative measures.
Cost calculations	Tries to do cost calculations.	Attempts to do cost calculations by using incorrect units or data.	Provides cost calculations using correct units and data collected without consideration of constraints.	Provides cost calculations using correct units and data collected and considers constraints.	Provides cost calculations using correct units and data collected and considers relevant constraints.

B. RUBRIC FOR ASSESSMENT OF CONSTRUCTION

Manufacturing/Construction/Restoration

ASSESSMENT RUBRIC FOR ASSESSING THE PRODUCT OR ARTEFACT (CONTINUE)

CRITERIA	1	2	3	4	5
Safe handling of tools/ equipment (face moderation)	Demonstrates awareness of safety measures.	Demonstrates awareness and knowledge of some safety measures.	Demonstrates adequate knowledge and awareness of applicable safety measures.	Demonstrates sufficient knowledge and awareness of applicable safety measures.	Demonstrates sufficient knowledge and awareness of all applicable safety measures and apply preventative measures.
Skills relating to handling of tools and equipment (face moderation)	Demonstrates limited knowledge and skills and equipment related to tools used.	Demonstrates some knowledge and skills related to tools and equipment used and house keeping.	Demonstrates adequate knowledge and skills related to tools and equipment used and evidence of house keeping.	Demonstrate adequate knowledge and skills related to tools and equipment used and good house keeping.	Demonstrate sufficient knowledge and skills related to maintenance and use of tools and equipment and excellent house keeping.
Knowledge of materials	Shows limited background knowledge on materials used.	Shows some knowledge of materials and their properties.	Shows adequate knowledge of materials and their properties and concepts.	Shows adequate knowledge of materials and their properties, concepts and principles.	Shows sufficient knowledge of materials and their properties, concepts and principles to solve problems.
Process techniques	Demonstrate some knowledge of inappropriate techniques used.	Demonstrates limited knowledge of techniques used.	Demonstrates adequate knowledge of correctly selected techniques.	Demonstrates adequate knowledge on how to selected and apply the relevant techniques correctly.	Demonstrate sufficient knowledge of correctly selected and applied techniques considering possible constraints.
Skills used in processes (face moderation)	Demonstrates limited knowledge of skills needed.	Demonstrate some knowledge of skills needed.	Demonstrate adequate knowledge of skills needed.	Demonstrate adequate knowledge of skills needed and considering some constraints.	Demonstrate sufficient knowledge of skills needed and considering relevant constraints.

C. RUBRIC FOR ASSESSMENT OF QUALITY

Quality

ASSESSMENT RUBRIC FOR ASSESSING THE PRODUCT OR ARTEFACT (CONTINUE)					
CRITERIA	**1**	**2**	**3**	**4**	**5**
Address the **problem/need**	The product is incomplete. The solution lacks details and making interpretation difficult.	The product is complete but do not address the problem or need at all.	The product is complete and addresses the problem or need partly.	The product fulfils the purpose for which it was designed and shows no real evidence of innovation in the solution to the identified problem or need.	The product fulfils the purpose for which it was designed and shows innovation that is appropriate to the identified problem or need.
Appearance: dimensions and/or finishing off (neat, clean and protect)	Shows little effort to make appearance acceptable.	Product's appearance not acceptable due to dimensions/finishing off (evidence of only 1)	Product's appearance acceptable due to dimensions/finishing off (evidence of only 2)	Product's appearance acceptable due to dimensions/finishing off (evidence of all 3)	Product's appearance is very acceptable and shows a high level of innovation.
Calculations/ calibrations	Incorrect calculations/ calibrations caused the product not to be operational.	Uses Evidence of calculations/calibrations to render product operational but do not address the problem or need at all.	Evidence of calculations/ calibrations to render product operational addresses the problem or need partly.	Evidence of calculations/ calibrations to render product operational addresses the problem or need.	Evidence of calculations/ calibrations to render product operational fulfils the purpose and shows innovation that is appropriate to the identified need or problem.
Appreciation and Conclusion by learner	The product is incomplete.	The product is complete but do not operate at all and shows no new improvements.	The product is complete, operates, show no new improvements and little innovation.	The product is complete, operates well and shows same new improvements and innovation.	The product is complete, operates very well and shows many new improvements and a very high level of innovation.

Quality

ASSESSMENT RUBRIC FOR ASSESSING THE PRODUCT OR ARTEFACT (CONTINUE)

CRITERIA	1	2	3	4	5
Time management	Very little evidence of time management.	Demonstrates some sense of time management but planning not realistic.	Evidence of realistic time management on planning but do not keeping to plan.	Manages time well according to the initial plan.	Manages time exceptionally well by considering alternatives according to the initial plan.
Communication	Scant attention was given to communication techniques and no information sources.	Attention was given to communication techniques and no information sources.	Attention was given to communication techniques with some information sources.	Attention was given to communication techniques with information sources and making use of another type of communication.	Attention was given to communication techniques with information sources and making use of different types of communication.
Portfolio presentation/ organization	The portfolio is incomplete and poorly ordered and prepared.	The portfolio is completed but poorly ordered and prepared.	The portfolio is completed and adequately ordered and prepared.	The portfolio is completed and well presented.	The completed portfolio presentation shows a high level of innovation and creativity.