



NCDC

*NATIONAL CURRICULUM
DEVELOPMENT CENTRE*

**End of Year Sample
ASSESSMENT ITEMS FOR S.1 AND S.2**

**TECHNOLOGY
AND DESIGN**

2022

SAMPLE ASSESSMENT FOR END OF YEAR IN THE NLSC

SENIOR TWO

TECHNOLOGY AND DESIGN

Guidance to the Teacher

These sample test items are intended to guide teachers of Technology and Design how to develop end of year assessment items for Senior One and Two. They do not constitute a complete examination paper for the subject. To determine the number of items in the paper, the teacher should consider the demand of each item on the test taker and the duration they can spend providing the response. At this level the Technology and Design paper should not take more than 1 hour and 30 minutes. The teacher should benchmark on the samples provided rather than replicate them.

Below each item, the learning outcomes assessed are indicated. This is intended to remind the teacher to keep the syllabus learning outcomes in mind while developing the items.

Short Response Item

1. Annet ordered a workshop attendant to prepare for her materials for making a strong storage shelf. Give and explain two characteristics of materials that Annet will be looking for from the workshop attendant. **(04 scores)**

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This item is developed from the following learning outcome:

- *Classifies engineering materials correctly and identifies their properties.*

Extended Response Item

Mr. Okello was happy that his two-storey residential house had reached level 2. But when he reached the site, many of the workers had stopped working claiming that many of their friends had got injured while working and also had no clear means of delivering materials to the level they had reached.



From your understanding of the problem and the skills you have acquired, explain to Mr Okello three ways in which the builders can deliver materials with increased efficiency and safety to the next level in the shortest possible time.

This item is developed from the following learning outcomes:

- *Illustrate the components of simple machines and describes their applications.*
- *Identify components of simple machines.*

SCORING GUIDE

Short response solution

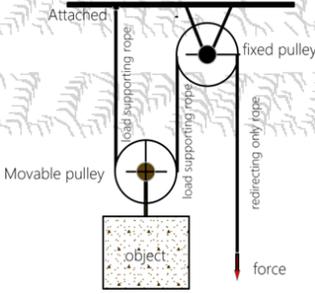
Characteristics that a client will be looking for from the materials.

Examples of Material	Explanation
Plastics	Moisture resistant, attractive
Ceramics	High compressive strength, heat-resistant and corrosion-resistant
Wood	Flexible, relatively light in weight, has good strength in both tension and compression; and provides rigidity and toughness.
Metal	Has high tensile strength, malleable, hard, tough, elastic
Concrete	
Score 4 for 2 materials given and the explained characteristics. Score 3 for 2 materials given and one of them explained. Score 2 for 2 materials given without being explained and any one given and explained. Score 1 for 1 material given.	

Total 4scores

Extended response solution

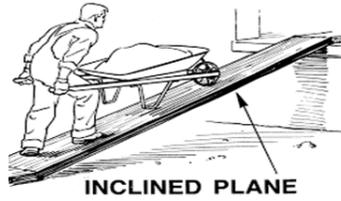
Ways of delivering material

OUTPUT	Basis of evaluation	CRITERIA 1 Relevance <i>Indicators describing the ways</i>	CRITERIA 2 Accuracy <i>Indicators relating to; - -importance/limitation - sketch - safe working conditions of means</i>	CRITERIA 3 Coherence <i>Indicators relating to the logical principles of operation well stated</i>	CRITERIA 4 Excellence
<p>Written opinion about the ways of delivery of material</p>	<p>Explanation of the different ways</p> <ol style="list-style-type: none"> 1. pulleys 2. cranes 3. inclined planes 4. conveyer belts 5. escalators 6. tow trucks 	<p>If correctly explained: All the 3 and above - score 3 2 - score 2 1 - score 1</p> <p>PULLEYS</p> <p>The pulley is a simple machine that changes the direction of forces and makes easier to move heavy material and objects.</p> <hr/> <p>INCLINED PLANE</p> <p>This is a simple machine that does not move when in use. It can be something as simple as a driveway (ramp) or a staircase. Load is pulled/pushed up a gentle slope. The slope is longer than the height to where the load is to be delivered.</p> <hr/> <p>CRANE</p> <p>Cranes are machines for moving heavy materials like steel and concrete into place for construction</p>	<p>If correctly described: 3 to 4 score 3 2 - scores 2 1 - score 1</p> <p>PULLEYS</p> <p>Importance Reduce the amount of force required to move an object.</p> <p>Limitation Using a system of pulleys can be much more complex.</p> <p>Maintenance</p> <ul style="list-style-type: none"> •Apply lubricant lightly over the central support frame. •Make routine checks to prevent loose bolts, worn out cable and pulley bearings. <p>Sketch</p>  <hr/> <p>INCLINED PLANE</p> <p>Importance Takes less effort to walk up.</p> <p>Limitation The distance up the ramp is longer. Friction affects the movement of an object on a slope.</p> <p>Maintenance</p>	<p>Learner logically explains the principles; All the 3 - score 3 2 of the 3 - score 2 1 of the 3 - score 1</p> <p>PULLEYS</p> <ol style="list-style-type: none"> 1. It operates by looping rope around a pulley. 2. The rope is attached to an object on the other end. 3. One pulls down on the rope to raise the object. 4. The material is removed. <hr/> <p>INCLINED PLANE</p> <ol style="list-style-type: none"> 1. An object is simply placed on the ramp. 2. The object is pushed up the slope. 3. The material is removed. <hr/> <p>CRANE</p> <ol style="list-style-type: none"> 1. The rope is lowered down along the hook to attach the load. 	<p>Learner scores 1 if he/she provides anything that was not solicited for to enrich explanation given to Mr. Okello</p>

workers and assembling a building. Cranes combine simple machines. The crane's beam is balanced at a point, called the fulcrum and acts as a simple lever. Cranes also make use of the pulley, another simple machine.

Grease the wheel.
Ensure proper storage.

Sketch



CRANE

Importance

Lifts heavy objects with a relatively small force.

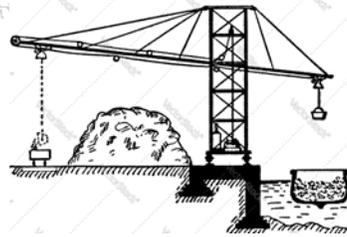
Limitation

Expensive compared to the previous means.

Maintenance

- Ensure proper alignment.
- Inspect chains and connections for damages.
- Make sure the hook is intact.
- Check air and hydraulic systems daily.
- Replace wheels.

Sketch



2. A crew of riggers is securely attached to the hook to ensure a stable lift.

3. The crane operator performs a series of moves, including raising the load with the rope, rotating and spinning the crane and trolley travel, which moves the load along the jib.

SENIOR ONE
TECHNOLOGY AND DESIGN

Short Response Item

A designer seeking to produce portable plastic seats has been advised to follow a given set of principles. From your experience as a Technology and Design learner, guide him on any two appropriate principles he should use in designing the seats.

(04 scores)

i).....
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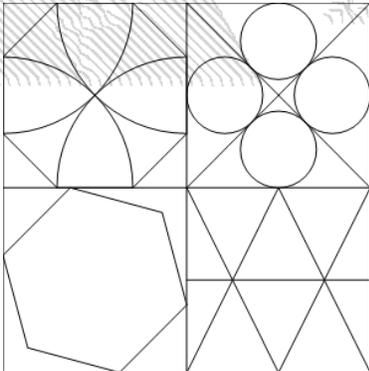
ii).....
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This item is developed from the following learning outcome:

- *Use of basic elements and principles of design.*

Extended Response Item

Mr Bwire has built a store with square window openings of size 1m by 1m. The fabricator has provided him with a sketch of burglar proof designs which are irregular as shown in the figure below.



Using 1/10 of the window opening, make a clear and accurate drawing of the burglar proof design to enable Mr. Bwire decide on a pattern for his store. **(20 scores)**

This item is developed from the following learning outcome;

Appreciate common shapes and their features as used in design.

GUIDE

Short response solution

Principles used in designing.

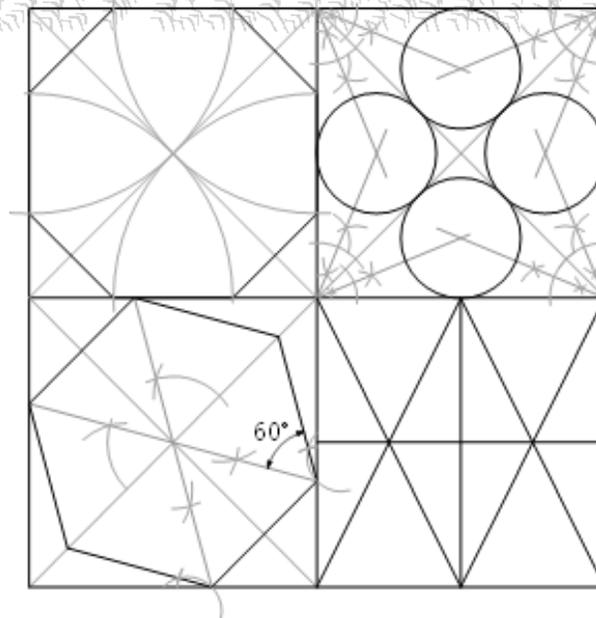
Principle	Explanation of the principle
Function	The purpose to which the design is made
Environment	Need to address surrounding parameters when developing products
Economy	Omits all non-essential or unimportant elements and details that don't contribute to the essence of the overall composition of the product. (emphasise what is important)
Structural	Ability of the design to transmit/support load
Architectural	Covering and meeting the needs and demands, to create living spaces, using certain tools and especially, creativity

Score 4 for 2 principles given and their explained characteristics.
Score 3 for 2 principles given and an explanation for one of the principles.
Score 2 for 2 principles given without explanation, or for one principle and its explanation.
Score 1 for one principle given.

Total 4 scores

Extended response solution

Pattern of the window burglar proof design



Output	Basis of evaluation	Relevance; indicators	Accuracy	Coherence	Excellence
Drawing of a burglar proof design	Shapes and patterns	Learner draws the shapes either with or without measurements; -square -octagon -circle -hexagon -triangles	Learner follows the given measurements and geometrical principles to draw the different shapes; -square -octagon -circle -hexagon -triangles	Learner follows the correct geometrical methods to draw the different shapes of; -square -octagon -circle -hexagon -triangles	Learner scores 1 if he/she provides anything that is unique in the construction procedure
		Score 3 for any 4 to 5 shapes drawn. Score 2 for any 2 to 3 shapes drawn. Score 1 for any 1 shape drawn.	Score 3 for any 4 to 5 shapes drawn. Score 2 for any 2 to 3 shapes drawn. Score 1 for any 1 shape.	Score 3 for any 4 to 5 shapes drawn. Score 2 for any 2 to 3 shapes drawn. Score 1 for any 1 shape.	