GRADE: 5
SUBJECT: NATURAL SCIENCES AND TECHNOLOGY
TERM ONE
FORMAL ASSESSMENT TASK (FAT) 1

Name: ________________________________________________________
Class: ______________________ Date: ___________________________
School: ____________________ Teacher: _______________________

<table>
<thead>
<tr>
<th>FAT</th>
<th>Activity/Form</th>
<th>Learner's mark</th>
<th>Learner's %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Practical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>
Formal Assessment Task

Practical Task: No 01
Knowledge Strand/s: Life and Living and Structures

Topic: Skeletons as Structures

Name of Learner: ___________________________ Class ______

Instructions

1. You will complete the practical activity in class under supervision.
2. Complete all activities as per instruction from your teacher.
3. Use a pen for writing.
4. All sketches must be done in pencil.

Major Process and Design Skills:
*Access information *Recall information *Observe *Compare *Measure *Sort *Classify *Identify problems *Raise questions *Design *Make / Construct *Evaluate and or improve products * Communication

1. Observations and background information

Key concepts you have observed about vertebrate skeletons:
- they consist of bones and joints and are found inside the body
- bones are hard and form a strong frame structure
- the skeleton gives support to the body and protects the internal organs.
- The skeleton is made up of different parts each with a specific function:
  - Skull- protects the brain, eyes, middle and internal ear
  - Backbone- protects the spinal cord
  - Ribs- protects the lungs and heart
  - Shoulder blade, legs and hips- allow for movement.

Key concepts you have observed about structures:
- Shell structures are formed from one piece of material.
- Frame structures are made from different parts that are joined together.
- Structures can have different shapes and sizes.
- Structures can be made from different types of material.
- There are different ways to strengthen material such as by rolling paper into long tubes.
- Struts are joined to make triangular shapes that make structures strong and stable.

Note: A strut is the part of a made frame structure used to keep two things apart by giving outward support in its length. It will prevent a pushing force from making a structure falling over.
2. **Scenario / Case Study**

Read the case study below and complete the instructions.

You have been studying animal skeletons at school. Your school is going to have an open day for parents. Your teacher wants you to make a 3-dimensional (3-D) model of a vertebrate skeleton to show your parents how Natural Sciences and Technology are integrated.

You may choose any example of a vertebrate skeleton. You must show how the bones form a strong and stable frame structure with the limbs attached.

Your skeleton must meet the following specifications:
- It must be 3-dimensional model.
- Must have the following basic parts: skull; backbone; ribs and limbs
- Must look realistic (must have the general shape of the skeleton)
- The limbs must be in proportion to the body.
- The skeleton must be strong enough to stay together (struts)
- The model must be able to stand on its own.
- You must first make a drawing of the model that you are going to make.

Things to consider (You may present this in a mind map)
- Which vertebrate skeleton will you make?
- Which parts need to be flexible and which parts are rigid?
- Which parts act as struts to support a load?
- Which parts are frame structures and which parts are shell structures?
- What material will you use?
- How will you join the parts together to form the spinal column?
- How will you join the skeleton parts together - adhesive tape, paper fasteners, string, thin wire or anything else?
- What is the proportion of one part of the skeleton to the other parts?
- Indicate whether there are any other constraints and specifications.

3. **Design Brief**

Write the problem in your own words showing that you understand the problem you must solve. Complete the following:

I must design and make a ...........................................................................................................................(3)
4. **Design**

Draw a design of the vertebrate skeleton you have decided to make. Use labels to show the type and parts of the skeleton, measurements, material to be used and where the material will be joined. (5)
5. **Tools, equipment and material**
Complete the table by ticking or adding what you will use to make your skeleton. (2)

<table>
<thead>
<tr>
<th>Tools</th>
<th>Material</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pencil</td>
<td>Paper straws</td>
<td></td>
</tr>
<tr>
<td>Ruler</td>
<td>Plastic drinking straws</td>
<td></td>
</tr>
<tr>
<td>Scissors</td>
<td>Paper fasteners</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adhesive tape</td>
<td></td>
</tr>
</tbody>
</table>

6. **Steps for making**
List a minimum of four steps you will follow when making the skeleton. (2)

1. …………………………………………………………………………………………………
   …………………………………………………………………………………………………

2. …………………………………………………………………………………………………
   …………………………………………………………………………………………………

3. …………………………………………………………………………………………………
   …………………………………………………………………………………………………

4. …………………………………………………………………………………………………
   …………………………………………………………………………………………………

7. **Make**
Use all the resources and planning notes and make the skeleton as designed. (6)

8. **Evaluation**
Use ANNEXURE 1 and complete the self-evaluation tools.

9. **Improvements**
List two improvements you will make to your planning or to the skeleton if you could make the model again. (2)

1. …………………………………………………………………………………………………
   …………………………………………………………………………………………………

2. …………………………………………………………………………………………………
   …………………………………………………………………………………………………

10. **Communication**
Present your model and the written work to your teacher.

**TOTAL MARKS** (20)
ANNEXURE 1
INFORMAL ASSESSMENT

Learner Evaluation
This must be completed by the learner.

Self-Assessment Checklist

<table>
<thead>
<tr>
<th>The drawing of my model:</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 meets the design brief</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 is drawn correctly, showing all the parts with labels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 shows the measurements of the parts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 is neatly drawn.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Evaluate my skeleton model | Achieved | Improvements which I could make
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the skeleton look realistic? (Looks like the chosen skeleton)</td>
<td>YES/NO</td>
<td></td>
</tr>
<tr>
<td>Is the skeleton a 3-D frame structure?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are struts strong and neatly made and are they joined well?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the skeleton have all the parts: skull, spine, ribs, and limbs?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The model can stand without extra support?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FORMAL ASSESSMENT
This section must be completed by the teacher.

Formal Assessment Tool

<table>
<thead>
<tr>
<th>Criteria: The learner is able to:</th>
<th>Mark out of</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>write a design brief</td>
<td>/ 3</td>
<td></td>
</tr>
<tr>
<td>draw and label a suitable design</td>
<td>/ 5</td>
<td></td>
</tr>
<tr>
<td>list suitable tools, equipment and material</td>
<td>/ 2</td>
<td></td>
</tr>
<tr>
<td>list logical steps for making</td>
<td>/ 2</td>
<td></td>
</tr>
<tr>
<td>make a model accurately, neatly and safely</td>
<td>/ 6</td>
<td></td>
</tr>
<tr>
<td>list improvements</td>
<td>/ 2</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>( 20)</td>
<td></td>
</tr>
</tbody>
</table>

Overall comments

Signature: Teacher ______________________ Date: ______________________

Mark: / 20
1. Make sure that the learners understand the key concepts about vertebrate skeletons and revise the key concepts about structures taught in Grade 4.

2. Read the Scenario / Case Study with the learners and ask key questions to make sure they understand the problem they need to solve. You need to decide if the learners will write on the handout or complete the instructions in their NST exercise books.

3. Instruct learners to complete the design brief: e.g. Design and make a 3-D model of a skeleton of a vertebrate using paper straws. (The animal could also be named e.g. cow)

4. Design by drawing a solution for the problem given in the case study
   - Revise basic drawing skills and remind learners of the correct use of labels in a drawing
   - Draw an example of a skeleton on the board showing suitable labels. Erase drawing when learners start to work on their own design.

5. Show learners a collection of possible tools, equipment and materials they will be provided with by the school to make their model. Learners indicate in the tables provided what they will be using.

6. Explain to learners that all processes follow an order in which things are done; use simple daily activities such as making tea, coffee, toast or similar activities. Learners complete four basic steps for making their model. (E.g. marking and measuring out the material, cutting and shaping the material, joining the material and then testing to see if it meets the requirements). Learners may have more than 4 logical steps.

7. Learners make their model in class under your supervision. Allocate sufficient time for learners to complete their model in class.

8. Remind learners that the evaluation of their work is an important step. Ask learners to evaluate a common product that they use; i.e. compare and evaluate different stationery containers etc. Learners now complete the two self-evaluation tables on Annexure 1.

9. Learners list any two improvements they will make to their model or to their planning.

10. Depending on the time available you may ask each learner to present their model to the class and to list one improvement they will make. Each learner must hand in the written activities and their model. Use the Formal Assessment Tool and allocate marks as indicated in the table below.

---

### Criteria: The learners is able to:

<table>
<thead>
<tr>
<th>Mark out of</th>
<th>Allocate marks as follows</th>
</tr>
</thead>
<tbody>
<tr>
<td>write a design brief</td>
<td>/ 3</td>
</tr>
</tbody>
</table>
| draw and label a suitable design | / 5 | Allocate marks for:  
  o The name of the skeleton looks like the animal ✓
  o The four parts are labeled and identifiable ✓✓
  o Measurements are suitable ✓
  o Material and joints are appropriate ✓ |
| list suitable tools, equipment and material | / 2 | A maximum of two marks for correct selection of tools, ✓ equipment and material. ✓ |
| list logical steps for making | / 2 | Maximum of two marks for a minimum of four logical steps ✓✓ |
| make a model accurately, neatly and safely | / 6 | Allocate marks for:  
  o Model looks like the skeleton designed ✓✓
  o Measurements are as on the design ✓
  o Model stands on its own ✓
  o Neatness ✓✓ |
| list improvements. | / 2 | Maximum of two marks for any two improvements ✓✓ |
| TOTAL | (20) | |

---

Gr 5 FAT: NATURAL SCIENCES AND TECHNOLOGY- TERM 1 PRACTICAL