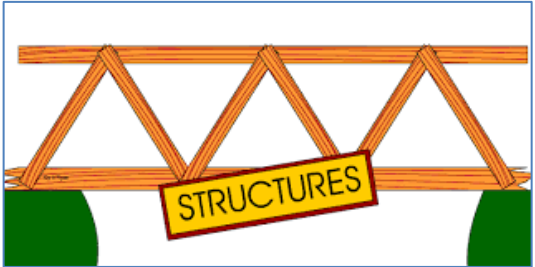
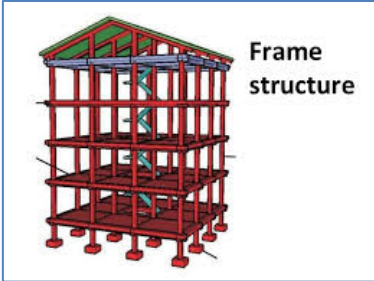


# GRADE 7 TECHNOLOGY TERM 2



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## Topic 1: Structures

A structure is something that is built, made or put together in a particular way. It can be a strong material, it can be stable and strong and can support loads. Structures serve the following purposes:

### Classification of structures

They hold or support something, e.g. bridge



They span or reach across a distance, e.g. cranes



They protect, enclose or contain something, e.g. wine in a glass or fish in a fish tank



**Natural structures** are structures that are **not** made by people, e.g. trees, plants and rock formations, e.g. caves, skeletons and bones.



**Man-made structures** are structures that are made in workshops and factories which include everything people make, any object, even the packaging, e.g. a tent.



## Structures: definitions

A solid structure is dense with very few or no open spaces inside it.

A shell structure is a hollow structure that can carry a load.

A frame structure, such as a triangular frame, is very sturdy. A frame is made by joining separate pieces of material together at joints and is used to support a load.

## Activity 1

Classify the following structures. Write the answers in your books. Natural or man-made.

- |                 |                        |
|-----------------|------------------------|
| a) Trees        | f) Skeletons           |
| b) Clay pots    | g) Caves               |
| c) Burglar bars | h) Egg shells          |
| d) Plants       | i) Bridges             |
| e) Bottles      | j) a Truck and trailer |

## Activity 2

Look at the images below, then write down the name of each image. Now, identify if it is a shell, a frame or a solid structure by reading the definitions above on the previous page.

A.



B.



C.



D.



E.



F.



G.



### Activity 3

Copy this table into your workbook and complete it.

Make a tick in the column it belongs to.	Shell structures	Frame structures	Solid structures
Ostrich egg			
Milk bottles			
Candles			
Electricity pylons			
Plastic chairs			
A wall of a man-made dam			
Carved wooden artefacts			

## Topic 2: Cell phone towers

### Investigation: A cell phone tower as a frame structure

A cell phone tower is an example of a frame structure. Why do we call this type of tower a frame structure? Try to analyse the definition by looking at the many different pieces used to build the tower. Designers and engineers use triangulation to stiffen and support frames. What is triangulation?



## Activity 4

### Case study – Examine existing towers strengthened by triangulation

Evaluate the differences by thinking of the **advantages and disadvantages** of telephone systems.

#### Class discussion:

Compare a cell phone (mobile) to a landline phone. First, write a rough copy of the differences in your books. When you write the differences, think of the following: the purpose, safety, cost and the **impact** on the **environment** and society.

### Landline vs Mobile phones

**Environment means surroundings**

**Impact means influence / effect**

	Advantages	Disadvantages
Mobile phone		
Landline phone		

## Activity 5

Action research: To stiffen materials/ structures. Make use of Via Afrika Technology textbook for examples of stiffening materials page 86-88.

**Learners must bring newspapers and old paper for this practical activity on folding paper into tubes and using triangular shapes to stiffen materials.**

We all know that a flat sheet of paper is not strong enough to carry a heavy weight. However, we can change the character of a sheet of paper by changing its shape. For example, we can form it into a tube which will be strong and stable enough to build affordable and sturdy structures. We can use the following processes to change the characteristics of a material:

**Folding – bending something flexible over on itself so that one part of it covers another part.**

**Triangulation is the technique of building a structure out of triangular shapes to increase the strength of the structure.**

**Tubing – a piece of tube or a system of tubes rolled up.**

## **Impact of technology**

Technology is a very big part of our everyday lives. It helps us to save lives, e.g. emergency workers use the jaws of life to rescue trapped accident victims, which you learnt about in Term 1.



## Topic 3: PAT (Practical assessment task)

### Cell phone towers

Cell phone towers are everywhere and are built using materials to ensure stability, strength and rigidity( stiffness).



A new cell phone company has just launched an exciting new competition:

Work in groups of 2 to 4 people:

Look at cell phone towers in the area or bring pictures of towers or do research on google or you- tube to get started. Use what you know about technology to design your tower for the competition. Your tower needs to carry a heavy load in strong winds and heavy storms, so it must be rigid and strong.

Have you noticed that cell phone towers look like trees? How will you make your tower fit into the environment and not cause visual pollution?

- a. **Sketch initial ideas.** Draw two free-hand sketches in your workbooks, to show two different design ideas in 2-D. Remember to add all details to sketches.
- b. Write a **design brief** with specifications for a new cell phone tower. The team then decides on the best design brief for their presentation.

### DESIGN AND SKETCHES

- c. **List the resources or materials and tools** to be used.
- d. Work with a partner to examine and discuss the design ideas and determine the **advantages and disadvantages** of their designs and choose the best one for their presentation.



## SCENARIO

- Make a **poster to present to the class**, of your impression, of a cell phone tower. One of the design ideas must involve disguising the tower so that it blends in with the environment, avoiding **visual pollution**.
- Teams **build the model** according to the chosen design brief, using safe working practices.
- Teams **present their posters**, their **model and plans** to the class.
- During the team presentations, teams use a copy of the **rubric** to assess presentations of the other teams.

## Images of cell phone towers



# RUBRIC

Criteria	Exemplary	Competent	Developing	Progression
	<b>Very well done in all aspects of the task 5</b>	<b>Well done in most aspects of the task 4</b>	<b>Mastering only some aspects of the task 3</b>	<b>Still needs a lot of assistance to complete the task/ Cannot complete the task, have to revisit 2/1</b>
The actual need is addressed				
It is short and to the point. The function of the product is clear.				
It is clear and simple.				
It is a general description.				
All the given constraints are identified.				
All the specifications are identified and own specifications are added.				

**Total mark: 30**



## Topic 4: Cell phone design

### Cell Phones

- Cell phones are designed to work on cellular networks, e.g. Vodacom, MTN and CellC..
- Various kinds of cell phones are available, e.g. Samsung, Nokia and Sony.
- Although there is a large variety to choose from, most have a set standard of services that allow phones of different types to communicate with each other.
- **Roaming** permits the same phone to be used in various countries, provided the operators of both countries have a roaming agreement.
- If a **modem** is attached, the operator can send and receive data.
- Various applications are available such as a clock, alarm, calendar and games. It is also possible to send and receive pictures and videos.
- Most phones have bluetooth and integrated or connected GPS receivers. People can choose between a ring tone, a vibrating alert or a combination of both.

### Activity 6: Looking at various cell phones and their features

Use your own cell phone for information. If you do not have a cell phone, choose any phone. Answer the questions in your book. Peer mark each other's work.

1. Write the name and make of the cell phone. (1)
2. How do you think people make overseas phone calls? Explain.(2)
3. Which facility on the phone enables it to connect to a computer?(1)
4. Name four applications of the phone. Explain what these applications are used for. (8)
5. How do we send and receive pictures and videos? (1)
6. Explain what it means if the cell phone has "Bluetooth" (1)
7. Why is it necessary for a cell phone to have the following features:  
a) ringtones (1) b) screen savers (1)
8. Choose one of the following and write one advantage and one disadvantage of social media, e.g. whatsapp, facebook, chat on, twitter, instagram, snapchat.  
Give reasons why an age restriction is important for the use of these sites. (5)

**Total: 20**

## Activity 7

### Design brief: Cell phone

You need to write a design brief for a new cell phone that you are going to design.

You can start your design brief with: I am designing a (cell phone) .... and making a product called a (choose a new name/make for cell phone .....'. Remember to describe the problem and not the solution.

### Specifications:

- a. What size and colour will it be? (2)
- b. What will your cell phone be called? (1)
- c. Describe your new cell phone. (2)
- d. Why would people buy this cell phone? (1)
- e. What added benefits will the cell phone have for the user? (2)
- f. Make a drawing of your cell phone. Add labels and colour. (3)

### Constraints:

- a. What problems could you have in the design? (2)
- b. What could go wrong? (2)

**Total: 15**

