Western Cape Government
Education

Directorate: Curriculum GET

GET Term 2 Take Home Package

Technology

Grade 8

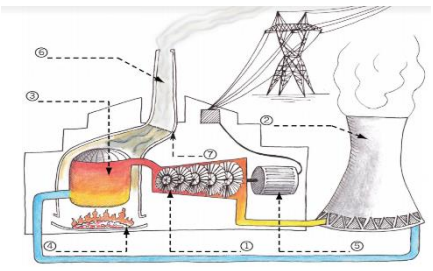
Take Home Resource Pack: TECHNOLOGY TERM 2: Grade 8

Content	Explanation
Processing	Demonstrates knowledge and understanding of how materials can be processed to change or improve their properties by adapting them to suit a purpose.
Forces	to withstand forces (e.g. tension, compression, bending, torsion, shear)to increase strength or life-span
Natural materials	It includes air, water, soil, plants and animals. Some examples of natural materials are wood, leather, clay and grass Waste of natural materials is broken down in the natural environment to form harmless substances like compost. Some natural materials break up into harmless substances simply when they lie in the sun or in water for some time.
New materials	These materials are made in factories. They are often made from oil or coal that are found under ground. This includes materials like plastic, certain paints, and certain fabrics used to make clothes. You may have heard of "polyester clothes", "PVA paint" and "neoprene rubber". These are called **synthetic materials**.
Bio-degradable	A material is called biodegradable if natural processes can break the material into small harmless pieces.
Pollution	There is another disadvantage to synthetic materials that most people do not see. Harmful waste is often formed at the factories where the synthetic materials are made. This waste can end up in the air, the water and the soil. Modern factories are designed better than older factories so that they release less harmful waste into the environment.
Textiles	Textile is a word commonly used to describe something made from fibres.
Fibres	Fibres are the basic materials (building blocks) and can be natural (wool, rubber, cotton, wood, carbon) or synthetic (nylon, polyester-made from chemicals). These can be processed in different ways: they can be twisted together to produce yarn, can be pulped and rolled to produce sheets, they can be extruded (forced through a small hole) to produce thread. Fibres can be classified as primary materials. When they have been processed they can be called secondary materials.

The Impact of Technology: Coal Fired Power Station

All products impact on our lives or the environment in positive and / or negative ways.

Coal fired power stations burn coal to create steam. The steam turns turbines that create the electricity. The electricity is distributed to our homes.



Positive impact: Electricity for our cities

Negative Impact: Air pollution; Health problems

1. How do you think a coal-fired power station impacts on the environment?
   ……
   ……
   ……
2. How do you think a coal fired power station impacts on people?
   ……
   ……
   ……

SOLUTIONS TO FOSSIL FUEL

4.1 Solar Power Generation

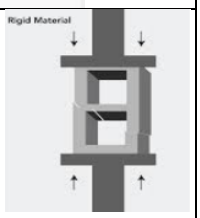
The largest solar farm located in the very sunny town of De Aar (Central South Africa) is actually the largest solar power plant located in the So uthern hemisphere. It was built in 2016 and has more than 700 000 solar panels. It covers lots of land – 150 hectares of land. It produces 175 MW (megawatts of electricity)

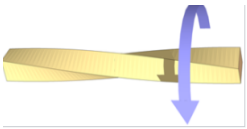
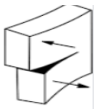
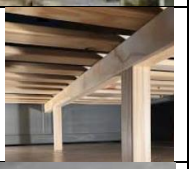
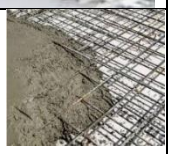
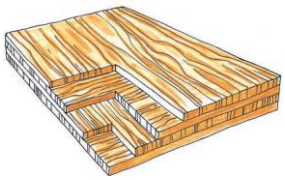
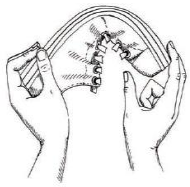
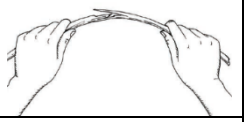
The **impact on the environment** is that some plants and animals will lose their habitat and hazardous materials are used during the manufacture of the panels. Solar farms do not cause any air pollution once installed.

4.2 Wind Power Generation

South Africa's five large renewable energy wind farms contribute 645.71 megawatt (MW) to the grid. Together, SA's renewable energy projects contribute 3,773 MW, compared to the 43 000MW currently delivered by coal fired power station.

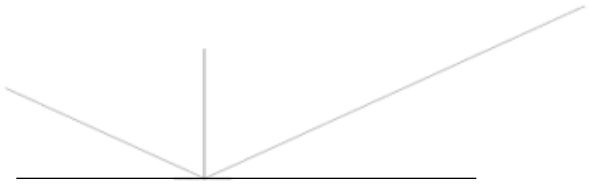
Wind farms have an **impact on the environment** because the spinning blades pose a threat to flying birds and bats. The wind farm can also divide up the habitat of plants and animals. Wind farms do not cause any air pollution.

Content	Explanation
Tension	Two pulling forces, directly opposing each other, that stretch an object and try to pull it apart. For example, pulling on a rope. 
Compression	Two pushing forces, directly opposing each other, that push against an object and try to compress it. For example, pushing on an empty can. When the forces are aligned towards each other, they are called compression forces  
Bending	**If an uneven force is applied to an object, it will tend to change shape and bend. For example bending a metal wire.** 

Torsion	**Torsion is the twisting of an object due to an applied torque (turning force)** 
Shear force	**Shearing forces are unaligned forces pushing one part of a body in one specific direction, and another part of the body in the opposite direction.** 
pillar	**A tall vertical structure of concrete, wood, or metal, used as a support for a building or heavy bridge** 
Beam	**A beam is a structural element that primarily resists bending loads applied to it** 
Reinforcing	**To make a structure withstand large tensile and compressive forces, another type of strong material is put inside the structure** 
Reinforced concrete	**To make concrete withstand large tensile and compression forces, steel rods or mesh is placed in the concrete when the wet concrete is poured into a shape or mold. Page 131 and 132** 
Plywood	**Plywood is a made by glueing many thin layers of wood on top of one another. The grain in each layer is at a right angle to the grains in the layers above and below it. Plywood can therefore withstand large tensile forces in both directions. Page 133** 
Elastic	**When you stop pushing or pulling an elastic material, it returns to its original shape**  
Fracture	**If a material is bent too far it will crack (fracture).** 
I-beam	**Beams can be shaped in special ways to make them resist bending. The shape called an I-beam is a shape that resists bending very well.**  

ISOMETRIC DRAWING:

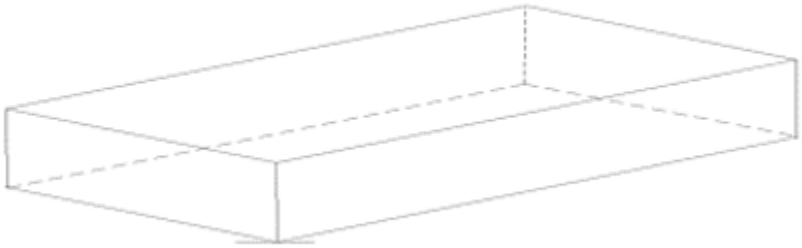
1. Start with the horizontal baseline and a vertical line from the point where you start the drawing. (A)
2. Draw 30^0 lines. One to the right and one to the left OR you can us isometric grid paper. (A)
3. Measure and mark the correct LENGTH, WIDTH AND HEIGHT on the three lines. (A)
4. Draw the three vertical lines (B)



A

B

5. Draw 30^0 lines from the measured heights.
6. Draw the **hidden lines using dashed lines**. First draw using the thin construction lines.
   Note: Three lines meet at every corner of an isometric drawings



If you use isometric grid paper then drawing instruments are not required.

Design Process

INVESTIGATE: Did you …	Y/N
Identify and analyse the problem, need or opportunity	
Investigate and evaluate existing products that are similar	
Investigate by doing a Case Study or practical investigation.	
DESIGN BRIEF Do you know …	
What you are designing? What need has to be solved?	
For who you are designing?	
What is it for? (reason)	
Where will it be used?	
DESIGN SPECIFICATIONS: are requirements that the product must meet. Some specifications you can identify from the scenario and others you will develop.	Y/N
Have you considered **safety**, **size**, **material**, **function**, human **rights** and **environment**	
Did you also think about **Materials**, **size**, construction methods	
DESIGN CONSTRAINTS: are **limitations** in which the product or solution must be developed. Think about the following when developing the constraints	Y/N
time, material ,cost, tools, human resources	
DESIGNS	Y/N
Did you draw at least two freehand sketches that can solve the problem	
Did you provide details like: Dimension Colour Material	
Are the designs done according to the **specifications** and **constraints**	
Did you make notes about the strengths and weaknesses of each design	
Did you choose the best design and provide reasons for choosing that one	
MAKE	Y/N
WORKING DRAWING: This drawing is used as a template for making your product • Use the type of drawing required: Perspective, oblique, isometric or orthographic drawing • The drawing must have a heading. • The outline of the drawing must be darker than the dimension lines. • The dimensions (measurements) are written in millimetres,	
LIST the steps for making the product	
List of tools and materials	
Did you make the product by considering all skills and safety precautions?	
Are you sure that you are still on track with the design brief and specifications	
EVALUATE	Y/N
Does the product solve the problem in the scenario	
Does the product satisfy the design brief and specifications	
How can you improve on the design process?	
COMMUNICATE	Y/N
Present the product and portfolio to the class and hand it to your teacher.	