

1.1 New and emerging technologies

List 2 advantages to industry that have derived from new technologies

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Explain one reason why unemployment in the UK may rise as new and emerging technologies develop.

What is meant by the term Demographic movement? _____

Give one advantage and one disadvantage to demographic movement

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-

What is meant by the term 'enterprise business'? _____

Give an example of a crowd funded company _____

New and emerging technologies are responsible for alternative power sources such as:

-
-
-

1.2 Evaluating technologies-Informing design decisions

What is meant by the term Carbon footprint? _____

What is a life cycle analysis? _____

Give the Life cycle analysis of a tin can _____

Having drilled and extracted oil from under the sea, describe the possible environmental impacts of transporting it to refineries (investigate)

1.3 Energy: generation, storage and choosing appropriate sources

What is meant by the term non-renewable energy source? Give an example in your answer _____

Renewable energy sources:

Renewable energy Sources	What is it?	Advantage (summarise)	Disadvantage (summarise)
Biomass			
Biodiesel			
Tidal			
Wind			
Solar			
Hydroelectric			

You are providing power to a community in the remote countryside. Choose an appropriate power source and justify your choice.

No energy source is completely clean, what other impacts do renewable energy sources have?

What is a power system? _____

Give a suitable power system for each product



Explain why solar farms are not welcomed by all communities. _____

1.4 Energy: Smart and composite materials, and technical textiles

What is a smart material? _____

Smart Material	What it does	Example as a product (investigate)
Shape memory alloy (SMA)		
		Transitional lenses Plane windshield
Reactive glass		
	Contains pigments that allows small currents to flow through it	

Explain why photochromic glass is used in a pilots cockpit _____

Describe the following terms:

Compressive strength _____

Tensile strength _____

Concrete has an excellent compressive strength, however its tensile strength is poor. Explain how its tensile strength could be improved

Give 2 reasons why glass reinforced plastic (GRP) is used for racing car body parts

- _____
- _____

Plywood is a strong and stable manufactured board, explain how it gains its strength _____

What composite material is used for the manufacture of canoes, car bodies, small swimming pools, water tanks, surfboards and small boat hulls? (technologystudent.com)

What is Kevlar? Describe the physical properties and some applications of this composite material.

Technical Textiles

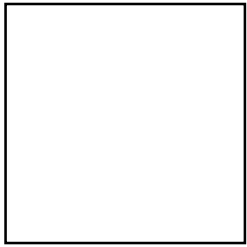
Use the internet to investigate the following materials, give other examples and products

Material	What it does	Example as a product or a task it performs
Agrotextiles		Shade cloth Insulation
Construction textiles		Roofing felt
Geotextiles		
Domestic textiles		Memory foam
Environmentally friendly textiles		
Protective textiles		Kevlar/armour
Sports textiles		High technology swimwear

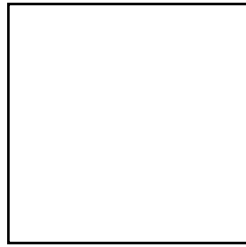
What is Kevlar, what are its properties _____

1.5 Mechanical devices used to produce movement

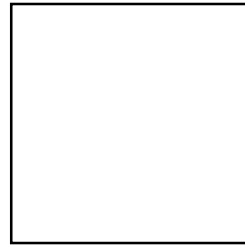
Sketch the 4 types of motion



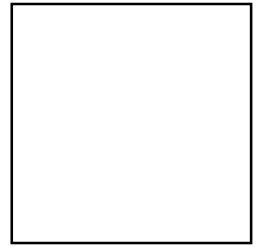
Linear



Reciprocal



Rotary



Oscillating

Levers

Sketch a class one lever

Sketch a class two lever

Sketch a class three lever

EFL

the

ELF

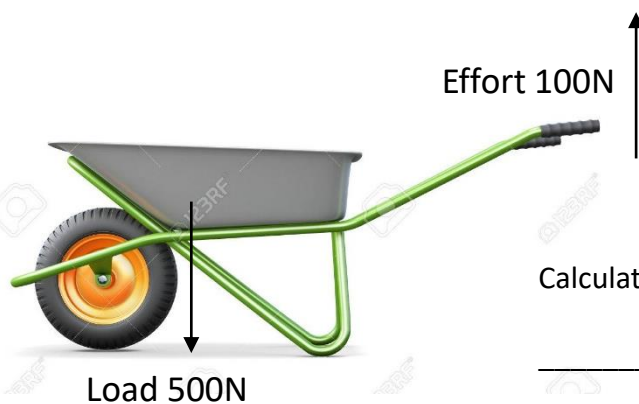
FEL

over

Give 3 examples of each type of lever

-
-
-
-
-
-

Describe the term Mechanical advantage _____



$$\text{Mechanical advantage} = \frac{\text{Load}}{\text{Effort}}$$

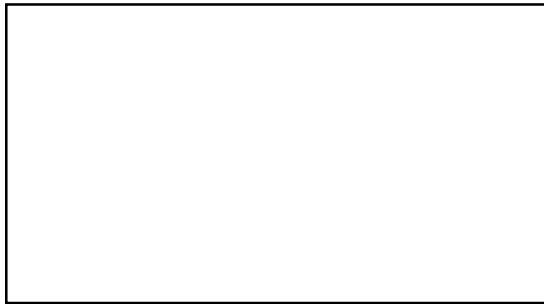
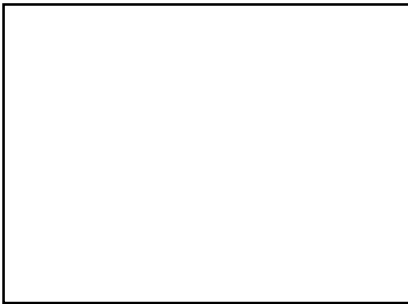
Calculate the mechanical advantage of the wheel barrow

Complete the formula:

Efficiency =

Explain the purpose of a linkage, give an example in your answer _____

Sketch a bell crank

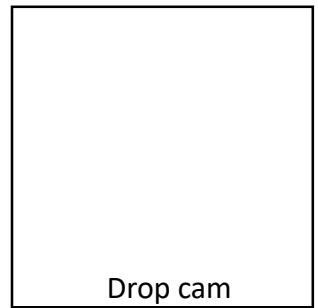
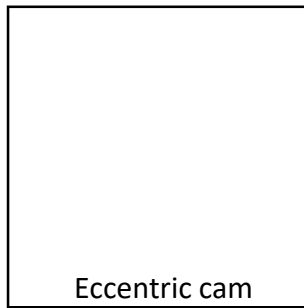


Sketch a reverse motion linkage that transfers rotary motion to reciprocal motion

Give an example of where one can be found _____

Cams transfer _____ motion into _____ motion.

Sketch the following:



Sketch and label a simple gear train

Sketch a rack and pinion

1.6 Electronic Systems

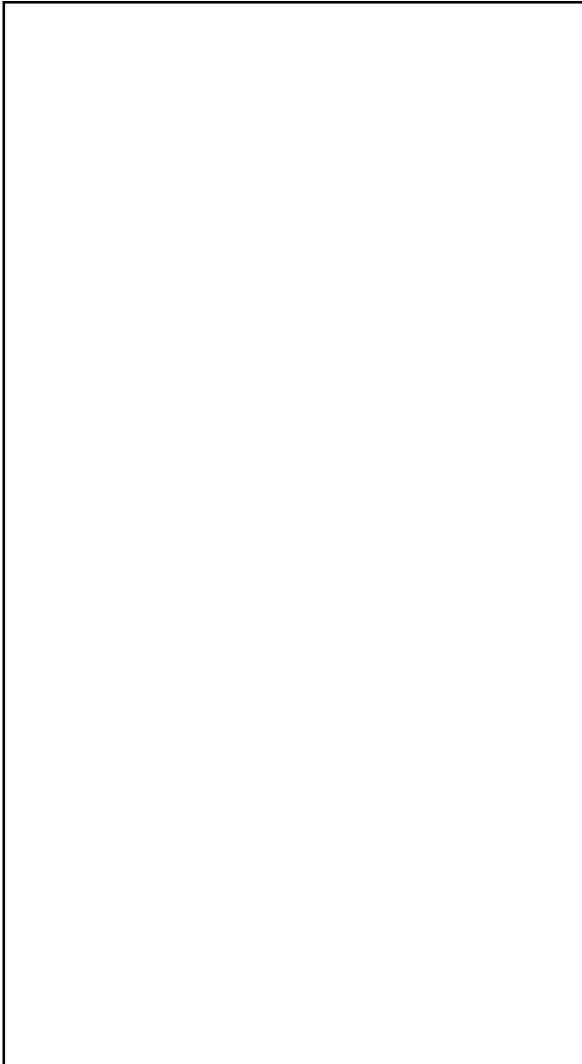
Sketch the following circuit symbols

Buzzer

Transistor

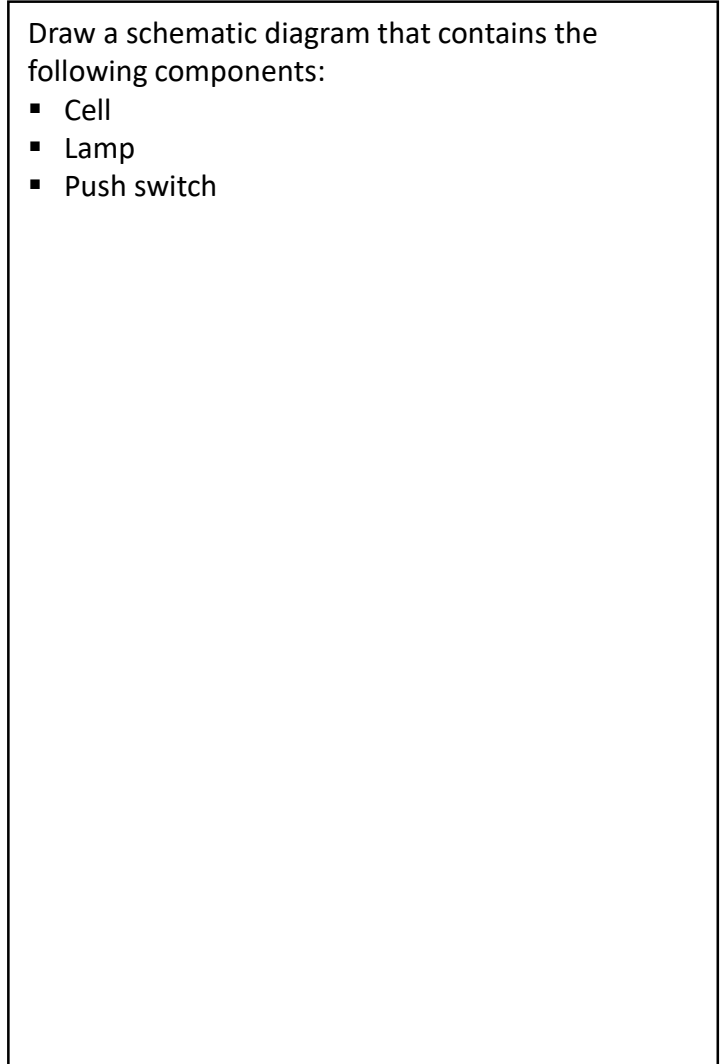
Motor

Light dependent
resistor



Draw a schematic diagram that contains the following components:

- Cell
- Lamp
- Push switch



1.8 Ferrous and non-ferrous metals

Ferrous metals are _____

Type	Properties	Composition	Examples of use
Mild Steel			
Stainless Steel			
Cast Iron			

Non-ferrous metals are _____

Type	Properties	Composition	Examples of use
Aluminium			
Copper			
Brass			

An alloy is _____

Give 2 types of alloy _____

Give suitable materials for the products below



Explain why you have chosen the material for the ladder _____

Explain why you have chosen the material for the piping _____

Ductility is the _____

A ductile metal is _____

Malleability is the _____

A malleable metal is _____

Hardness is the _____

A hard metal is _____