GCSE Resistant Materials Revision – Year 11 Mock Exam

Tools and Equipment

Hand Saws		
Gentleman Saw		Used for cutting straight cuts. 20tpi.
Tenon Saw		Used for cutting straight lines, bigger than a gentleman saw. Good for half lap joints and butt joints. Often used with a bench hook.
Hard point Saw		Used for cutting straight lines, bigger than a tenon saw. No back to add support.
Coping Saw		Used for cutting curved lines. Blades are disposable.
Hack Saw		Used for cutting straight lines in steel. Disposable blade.
Power Tools		
Drill Driver		Used to drill holes in materials or put screws into materials.
Jigsaw		Very similar to a scroll saw but it is hand held. The blade can be changed to cut different materials (plastic, metal and all timber).
Hand Held Belt Sander		Same as the belt sander but hand held.

Think about comparing tools;

Pillar Drill Vs Drill Driver	How are they similar?
Coping Saw Vs Jigsaw	What can they both do?
Belt Sander Vs Hand Sander	Is one faster/more accurate than the other?
Tenon Saw Vs Gentleman Saw	Can blades/belts be replaced? Why is this important?

Adhesives (Glue)

Name	Use	Pro	Con
PVA (Polyvinyl Acetate)	Gluing wood to wood.	It is very strong. It has a relatively long 'slip' time. It is ready to use from the bottle. It is environmentally friendly. It dries clear. It is relatively inexpensive. Cost effective.	It takes a long time to dry. It is not waterproof. It can only glue wood based/porous materials.
Cyanocrylate (Super Glue)	Gluing any resistant material (wood, metal or plastic) to any other resistant material.	It dries very quickly. It is strong. It dries clear. It can be used to glue almost any resistant material together.	There is no 'slip' time. It is harmful to the environment. It is an irritant. It is harmful to humans. It is expensive.
Epoxy resin (VIDEO)	For joining metals and plastics.	It is waterproof.	Must be mixed up immediately before use.
Acrylic cement (Tensol)	For the joining of acrylic and some other types of plastics. The adhesive "melts" the surface of the plastic and fuses it together.	Very strong. Easy to use. Easy to store.	It's a solvent. Health and safety issues. No 'slip' time.

Health and Safety

Whilst using machines you need to consider health and safety. You take a precaution to prevent a hazard.

- Goggles – Prevents wood chippings/cutting from damaging your eyes.
- Clamps – Prevents material from spinning out of your hands.
- Apron – Prevents loose clothing from getting caught.
- Long hair should be tied back – Prevents hair getting caught in machines.
- Black/yellow safety zone – One person in the box to prevent distractions and knocks.
- Guards – Make sure guards are in place if they are on the machine.

Technology Push/ Market Pull

Designers identify the opportunity to develop new products based on technology push or market pull.

Technology push is when products are re-designed because of changes in materials or manufacturing methods. This might mean that new materials have become available, with improved properties; or that improvements in manufacturing processes mean a manufacturer can make the product cheaper or more efficiently, which reduces manufacturing costs.

Market pull is when product ideas are produced in response to market forces. Examples of market influences include:

- A demand from consumers for new or improved products.
- A competing product is launched by another manufacturer.
- A manufacturer wants to increase their share of the market.

Ergonomics and Anthropometric Data

Ergonomics is the relationship between people and the products which they use. Anthropometric data is used to help design products to meet ergonomic needs. Ergonomics also considers the force a person can apply, for example when using a tin opener, or the pedals of a car.

Anthropometrics is the study of the sizes of people in relation to products. For example, chairs used in schools need to be suitable for the average size of pupils in the schools.

Flow Charts

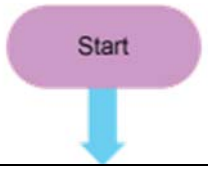
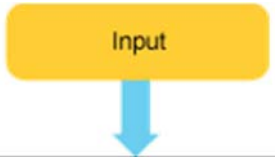
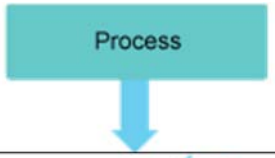
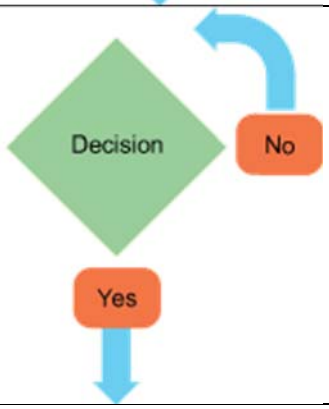
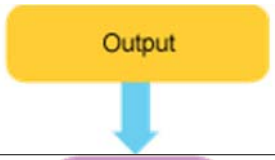
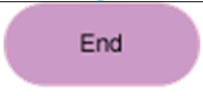
A flowchart shows the order in which a series of events is to be carried out. These are commonly used to program microcontrollers with instructions that control what the microcontroller will do.

Drawing flowcharts

There are several different types of event that might need to be included in a flowchart. Each of these is represented by a different symbol.

It is important that the blocks and symbols in a flowchart should be kept to a **uniform size** to avoid confusion. A complete set of symbols is listed in British Standard BS4058.

System flowchart symbols

	All flowcharts begin with the **start** symbol. This shape is called a terminator.
	**Inputs** to the system are represented by a parallelogram box.
	A **process box** is used when there is an **instruction** that must be carried out. This may be an action or it may be a command to tell the microcontroller to wait before continuing
	A diamond box is used when a **decision** needs to be made. This might include comparing the input states or comparing a count to a set limit. The outcome of the decision must be either yes or no. These can be in combination used to act as logic gates.
	**Outputs** to the system are represented by a parallelogram box.
	All flowcharts end with the **end** symbol. This shape is called a terminator.