

Year 7 Ideate Knowledge organiser



Headphone buddy

Pewter project

Knowledge organiser tools and equipment

Vernier gauge

Used to measure thickness of materials and diameters



Fret Saw

1. Wear goggles
2. Tie back long hair
3. Do not touch fret saw blade
4. One person on saw.
5. Ensure guard is on machine
6. Check blade tension and wear and tear
7. Turn off machine after use
8. Check for obstructions around machine



Chuck key

Pillar drill

1. Wear goggles
2. Wear apron
3. Tie hair back
4. No loose clothing
5. Clamp work in machine vice
6. Do not leave chuck key in chuck

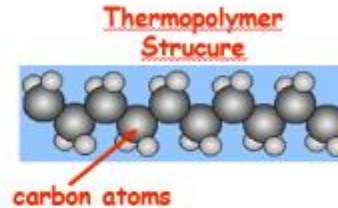


Knowledge organiser polymers

Types of polymers

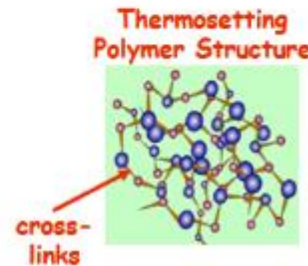
Thermopolymer:

- soften when heated;
- can be easily shaped and moulded with heat;
- when reheated they will **return to their original shape**, they have a **plastic memory**.



Thermosetting polymer:

- once moulded they **cannot be remoulded** even if heat is applied;
- come as either sheets or as liquid resins which can be made to set;
- they can withstand high temperatures.



Acrylic is a **thermo-polymer** which means it can be easily bent when heated. It comes in lots of different colours and has a smooth shiny surface. It is rigid but can shatter when put under too much pressure.



Impact of polymers on the environment

- Threat to marine life and birds
- Most are not recycled causing pollution
- Use fossil fuels which cause global warming
- Pollution of microplastics in what we eat, drink and breath



Knowledge organiser tools and equipment

Tools and equipment



Junior Hack saw
metal



Coping saw
wood and plastic



G Clamp



File



Needle files

Pewter Casting Process

Your mould is sandwiched between two pieces of MDF and held tightly in a vice

1. The pewter is heated in the ladle until molten and carefully poured into the void in the mould
2. Then left a couple of minutes to cool down and solidify



Pewter surface finishing and edge finishing

1. Use a junior hacksaw to cut off sprue and shape cast
2. Use Pillar drill to drill hole for key ring
3. Use course flat file to begin surface smoothing
4. Use smooth grade file to continue smoothing process
5. Use wet and dry paper
6. Use polishing wheel



<https://www.youtube.com/watch?v=NVoOxjB-2d4>
<https://www.youtube.com/watch?feature=endscreen>

Pewter Cast Project



Knowledge organiser metals

Where do metals come from?

Metals are found combined with other elements as **compounds** in **ore**. The ore is mined and then the metal is **extracted**.

Key words

- ore
- compound
- extraction

How does mining affect the environment?

Mining is damaging to the environment and causes:

- Soil erosion
- Contamination of soil and water
- Disturbance of wildlife habitats



What is an alloy?

An **alloy** is a mixture of metal with one or more other element/s which can be metals or non-metals.

Key words

- alloy
- pewter

What is pewter made from?

Pewter is a metal alloy made from 85–99% **tin**, mixed with approximately 5-10% **antimony** and 2% **copper**. It has a low melting point making it easy to cast.



Types of metals

There are two types of metals

Ferrous:

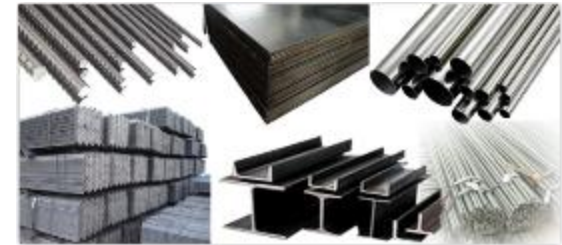
- Contain iron
- Corrode (rust)
- High tensile strength
- Magnetic

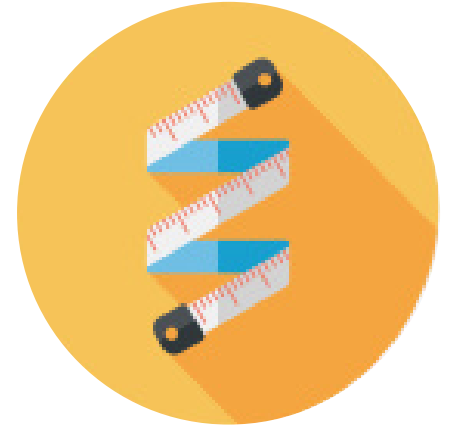
Key words

- ferrous
- non-ferrous

Non-Ferrous:

- Do not contain iron
- Do not corrode
- Low tensile strength
- Lighter weight than ferrous metals





Year 7 Made to Measure Knowledge Organiser

Wedge it

Trebuchet team challenge

Light sensor circuit

Knowledge organiser for door wedge

Tools and equipment



Try square



Bench hook



Tenon saw



G Clamp



Fretsaw



Disc sander

Measuring and marking out

Check where **0 measurement** starts on ruler and measure from that point.

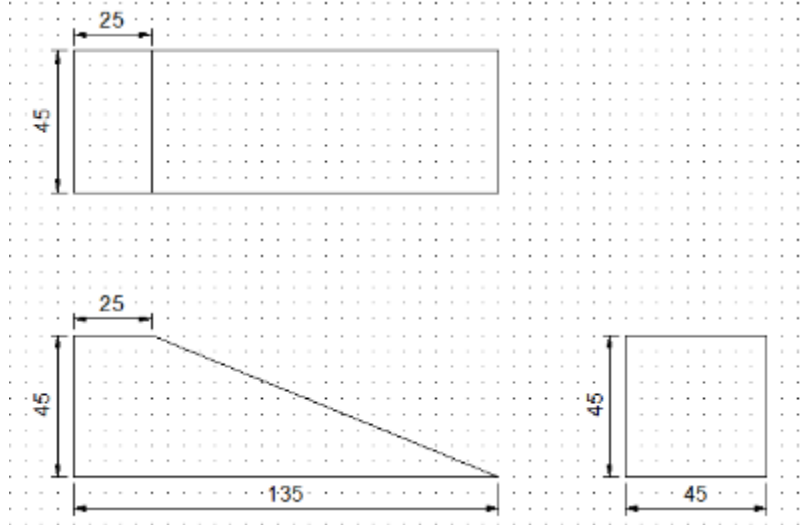
All measurements are done in **millimetres (mm)**. There are 10mm to 1 cm.

Use a **pencil** for all marking out

Mark out **waste** (the wood you do not want to keep) with diagonal pencil lines

Orthographic drawing

Side view drawn bottom left. Plan (birds eye view) view draw directly above side view. End view drawn in line with side view on right hand side. Guide lines used to line up views. Arrows running full length of lines show measurements which are all in mm



Wedge it

Knowledge organiser for wood

Hardwood

Hardwood comes from broadleaved trees. Most of these trees are **deciduous**; they lose their leaves in the winter.



Hardwoods are generally far more resistant to decay than softwoods when used for exterior work.

They are generally slow growing which tends to make them more expensive.

In the past, tropical hardwoods were easily available but the supply is now restricted because of the concern about the **conservation** of tropical forests.

Softwood

Softwood comes mainly from evergreen, **coniferous** trees which keep their foliage all the year.



These are trees like **pine** and fir trees that are typical of cooler parts of the world.

Softwoods grow faster than hardwoods so are cheaper.

Softwood is easy to work and has a huge range of uses such as building, furniture, doors and windows, it is also used in the production of paper.

Environmental impact of unsustainable logging

- Increase in CO2 emissions
- Global warming
- Flooding and soil erosion
- Poverty for forest dwelling people
- Loss of habitat for wildlife



Forest
Stewardship
Council™

The **FSC** is an independent, non-governmental, not for profit organization established to promote the responsible management of the world's forests.

It does this by setting standards and certifying and labelling forest products.



Wedge it

Knowledge organiser for tools and equipment

Working from the cutting list

All measurements are in **mm**. If it says **2 @** this is the **number of pieces** you need e.g. Base sides 2 @ 300mm this means you need to cut 2 pieces 300mm long

Glue Gun Safety

1. Wear goggles
2. Do not touch nozzle of glue gun
3. Only glue your work
4. Do not apply too much glue
5. Do not touch glue until you are sure it is set and cool
6. If glue gun not working turn it off and tell your teacher
7. Only glue in gluing area
8. Only 1 person using 1 glue gun at a time
9. If you burn yourself run it under cold water and tell your teacher



PVA

Adhesive used to join wood to wood



Pillar drill

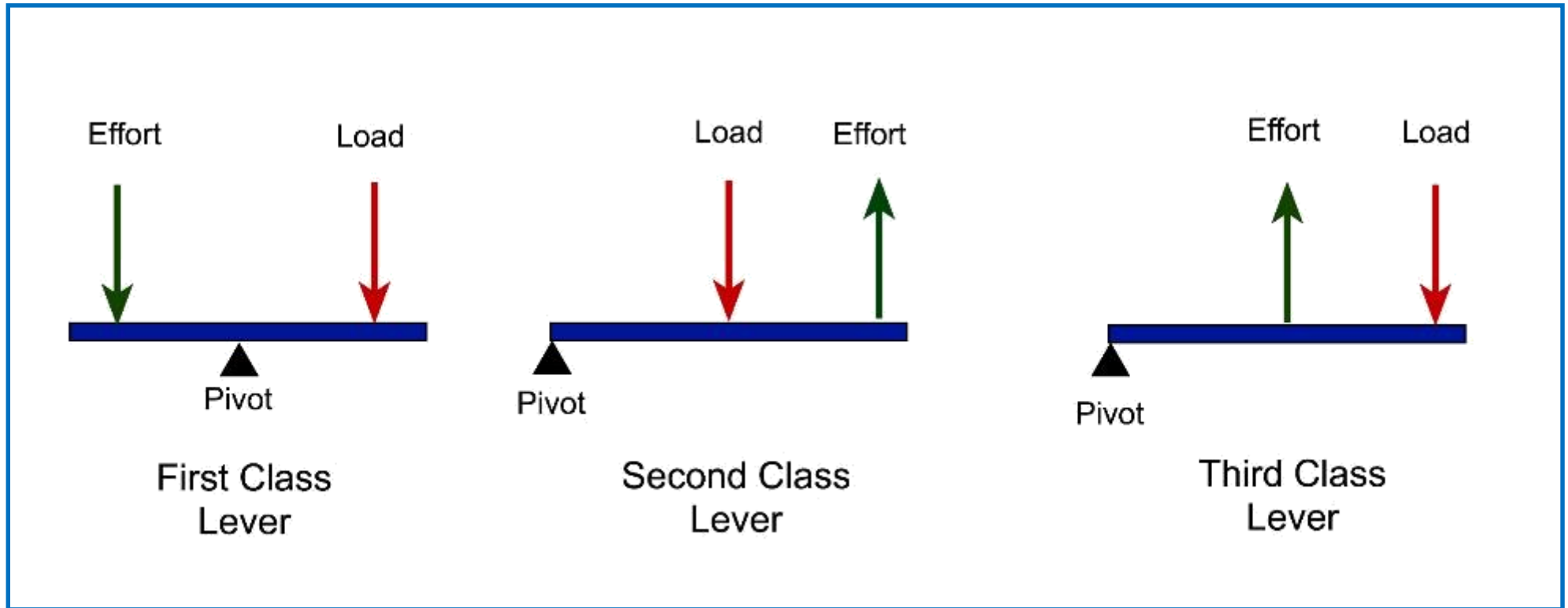
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Chuck key

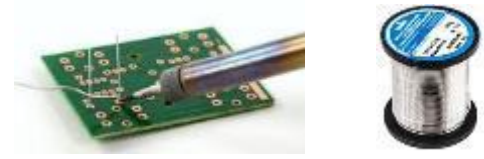






Knowledge organiser for levers



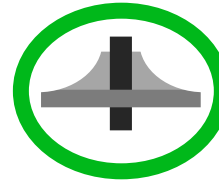
Knowledge organiser for electronics

The **green board** is referred to as a **Printed Circuit Board**. This is where all of the components are soldered in place. **PCB's** have silver tracks on them to allow the electricity to flow from one place to another. Components are attached using **solder**.



Component	What does it do?	Other Facts
Fixed/Variable Resistor 	It limits current in a circuit and protects some components.	Resistance is measured in Ohms . The colours on a fixed resistor show the value .
Transistor 	It acts as an amplifier It also can be used as an electronic switch .	It has three legs called the base, collector and emitter . It is polarised which means it has to go in the right way around.
Light Emitting Diode (LED) 	They produce light when a current is passed through them.	It is polarised which means it has to go in the right way around. (Long leg positive short negative!)
Light Dependent Resistor (LDR) 	An LDR is a resistor which detects light levels.	An LDR's resistance changes depending on the level of light coming into it. It can be set up to detect light or dark.

Soldering



A good soldered joint.
Connection to the copper track and to the component.



Bad soldered joints
Not enough solder or too much solder causing a dry joint. This makes a bad connection.

Soldering health and safety :

- Wear **apron** and **goggles**
- Use the **soldering iron stand, circuit board holder** and **soldering board** at all times.
- Only hold the soldering iron by the **yellow handle**.
- Check the **flex** of the soldering iron before starting.
- Think you have a problem? **Ask!**
- **Only solder the joints** on your circuit board
- If you **burn yourself** run it under **cold water** and **tell the teacher**