DT: Autumn Term: Year 7 Unit 1: Health and Safety

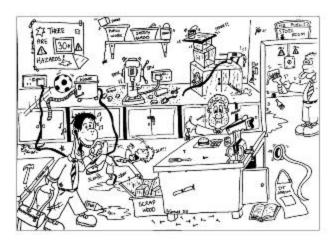


Glossary

Health and Safety

NOUN BRITISH

•regulations and procedures intended to prevent accident or injury in workplaces or public environments.



Why do you think workshop Safety Rules are important?

If everyone follows workshop rules, everyone will be safe and learn how to use tools and equipment properly and efficiently.

1. Always listen carefully to the teacher and follow instructions.

The instructions given by your teacher, will help you understand how to work in a workshop safely and efficiently.

2. Do not run / rush in the workshop.

You could 'bump' into another pupil and cause an accident. You could run into a machine or bench, which could cause a serious injury.

3. Know where the emergency stop buttons are positioned in the workshop.

If you see an accident at the other side of the workshop, you can use the emergency stop button to turn off all electrical power to the machines.

4. Always wear an apron.

It will protect your clothes and hold your tie in place.

5. Wear good strong shoes. Trainers are not suitable.

Tools and equipment can have sharp edges and are usually heavy. Good shoes prevent damage to your feet.

6. When attempting practical work, all stools should be put away.

If stools are left out in the workshop during a practical session, they will get in the way and inevitably become a trip haxard.

7. Bags should be stored away, during practical sessions in the workshop.

A person can easily trip over a bag left on the floor and accidentally push into someone using a machine.

8. When learning how to use a machine, listen very carefully to all the instructions given by the teacher. Ask questions, especially if you do not fully understand.

It is important to ask questions so you have a full understanding of its use to prevent an accident.

9. Do not use a machine, if you have not been shown how to operate it safely, by your teacher.

It is extremely dangerous (and illegal), to use a machine in the workshop, without having followed and understood, all the teacher instructions.

10. Always be patient, never rush practical work.

The most productive and efficient designers work patiently and never rush their work.

11. Always use guards, when operating machines.

The guard on a machine, protects the user, especially the users eyes, from dangerous 'debris' that is thrown out, often at high speed. The guards also ensure that hands and fingers, are not near moving parts.

12. Keep hands / hair and clothing away from moving/rotating parts of machinery.

Loose Clothing (e.g. a school tie) and long hair, can be caught in the moving parts of a machine. Long hair should be tied back.

13. Use hand tools carefully, keeping both hands behind the cutting edge.

Never place a hand in front of a cutting tool. There is always a possibility, of the tool slipping and the sharp edge slicing into the hand / fingers.

14. Report any damage / faults to machines/equipment. Damage or a faulty part, could cause an accident.

A broken or damaged tool can be dangerous.

15. Keep your workbench tidy. When you have finished with a tool / piece of equipment, return it to its storage cupboard / rack.

- A bench top, crowded with tools, will eventually lead to one or more, being knocked on to the floor, or on to feet.
- 16. Never distract another pupil, when they are working on a machine or using tools / equipment.

A distracted pupil could have an accident, as their focus and concentration is taken away from the work they are doing.

DT: Autumn Term: Year 7 Unit 2: Engineering - Spaghetti Bridges

Glossary

Engineering

... is the use of scientific principles to design and build machines, structures and other items, including bridges, tunnels, roads, vehicles and buildings.

Load

a weight or source of pressure borne by someone or something

Compression

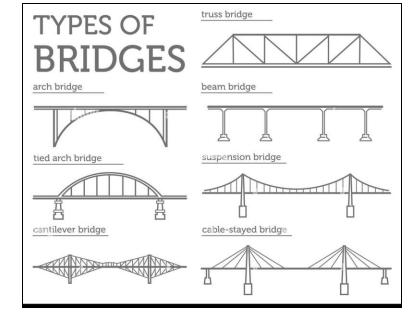
the action of compressing or being compressed. An external 'pushing' force applied to a structure

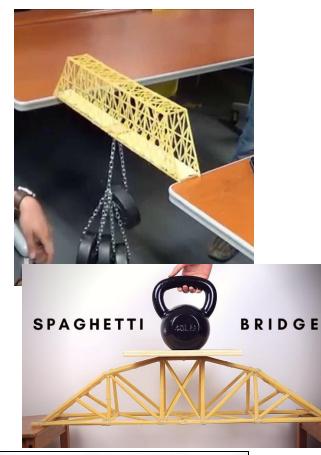
Tension

apply a force 'pulling' to (something) which tends to stretch it:











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Educational Activities for Kids: Spaghetti Bridges - Bing video

Golden Gate Bridge.

CHALLENGE 02

SPAGHETTI BRIDGES

enough to hold a bag of sugar?

Can you build a spaghetti bridge that's strong

Watch the video to see Dyson engineers attempt the challenge with their spaghetti replica of the

Year 7 Unit 3: Electronics - Simple Circuits

Glossary

Circuit

a complete and closed path around which a circulating electric current can flow:

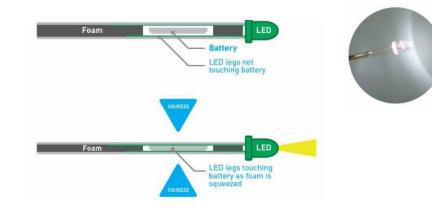
Coin cell

Also referred to as a button cell or watch battery, a coin cell battery is a battery which provides power to the system.

L.E.D (Light Emitting Diode)

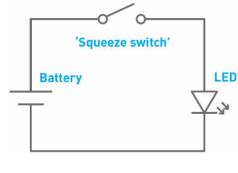
a light-emitting diode IS a semiconductor diode which glows when a voltage is applied. The torch works by powering a white LED from a coin cell battery. When the legs of the LED are touched against the terminals (faces) of the coin cell battery by squeezing the foam core, electricity flows from the battery through the LED, causing it to light up.

You can try this by placing the coin cell battery between the legs of the LED as shown in the picture to the right. It is important to connect the battery the correct way around otherwise it will not work. The longest leg of the LED should touch the side of the battery marked with the '+' sign.



Anode





CIRCUIT DIAGRAM

<u> Kitronik Squeezy Torch Kit – Kitronik Ltd</u>





Coin cells should be kept out of the reach of small children as they are very dangerous if swallowed, when immediate medical intervention is required.

Cathode

Anode

Long Lead

Flat Spot

Cathode

Short Lead

Build the torch by following these simple steps.

INSERT COIN CELL INTO FOAM

Insert the coin cell battery into the circular cut out in the neoprene foam core. The result should look like the picture shown.

PUT THE LED INTO PLACE

Now place the legs of the LED either side of the battery and foam layer as shown in the picture to the right. The result should look like the picture below, right. It is important that the LED is connected to the battery the correct way around otherwise the torch will not work.

The longest leg of the LED should be placed on the side of the battery marked with the '+' sign. You can check this by gently holding the legs against the battery. If the LEDs lights then everything is the correct way around.



ST TERESA

APPLY DOUBLE SIDED TAPE

The next step is to apply double sided tape to one side of each of the white PVC pieces.



ATTACH THE FIRST PVC PIECE

Take one of the pieces of PVC, remove the cover of the double sided tape and lay it over the foam inner layer.

Be careful to ensure that it is aligned with the foam centre. When you are happy, stick it in place.

ATTACH THE SECOND PVC PIECE

Now turn the torch over and stick the other piece of PVC to the other side of the foam by repeating the actions in step 4.



TEST THE CIRCUI

It's time to see if your torch works! Gently squeeze the two white sides of the torch together and the LED should come on.



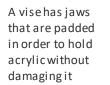
Year 7 Unit 4: Introduction to materials - Acrylic

ST TERESA of CALCUTTA

TABLE

There are two types of machine drill, the bench drill and the pillar drill. The bench drill is used for drilling holes through materials including a range of woods, plastics and metals. It is normally bolted to a bench so that it cannot be pushed over and that larger pieces of material can be drilled safely. The larger version of the machine drill is called the pillar drill. This has a long column which stands on the floor. This can do exactly the same work as the bench drill but because of its larger size it is capable of being used to drill larger pieces of materials and produce larger holes.

Wet and Dry paper used for the final finish on plastics and metal. This is used after filing has been completed.





Glossary Material(s)

the matter from which a thing is or can be made:

Acrylic

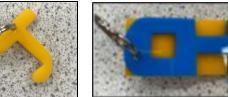
This plastic is often in sheet form as a lightweight or shatter-resistant alternative to glass.

Thermosetting

Thermosetting plastics once heated and formed to a shape, cannot be reheated and reformed. Consequently, they tend to be difficult to recycle.

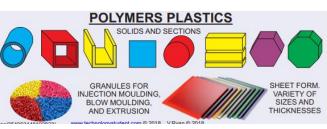
Thermoplastics

Thermoplastics once heated and formed to a shape, can be reheated and reshaped. Every time they are reshaped, the quality of the thermoplastic tends to be reduced. They are recyclable.



Research - Plastics (technologystudent.com)

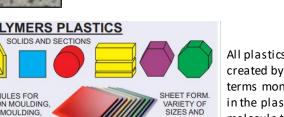












and curves. To use them accurately is a test of skill. HANDLE COLLET SAFE EDGE (NO TEETH ON THIS EDGE)

Coping saws are used for

cutting a range of woods or

acrylicinto unusual shapes

A hand file is used to smooth rough edges. They are made from high carbon steel and are heat treated to make them stronger than the materials they are applied to.

How to use...

Tools and

Equipment

ON/OFF

GUARD

ADJUSTMEN1

LEVER

of jewellery.

All plastics are based on polymers and they are created by bonding molecules together. The terms monomer and polymer are very important in the plastics industry. A monomer is a small molecule that can chemically bond to other monomers, forming a polymer. Remember all plastics are polymers.

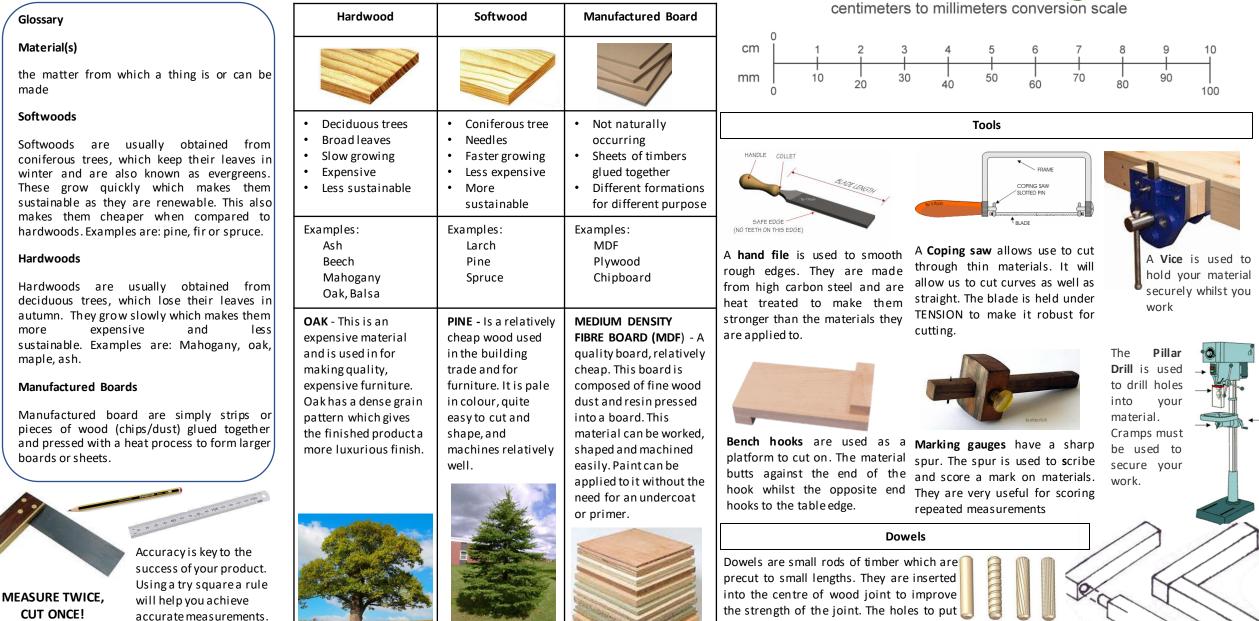
Hand files are normally held in both hands. The file Needle files – used to file down small sections of a design. Used a lot in the making

is held flat against the surface it is to cut / smooth. The file is then pushed forward and it cuts on the forward stroke. It is then lifted away from the plastic and returned to the starting point for the next push forward. This is called 'through filing'. Through filing is normally the first stage in smoothing a piece of metal or plastic. If the surface produced by through filing is not good enough - the next stage is 'draw filing'. The file is held in both hands by the blade and pushed forwards and backwards along the material. The final stage of filing / smoothing a piece of metal / plastic is to use wet and dry paper. The paper is held onto the blade of the file.

Hand Files / Engineers Files - 1 (technologystudent.com)

Year 7 Unit 5: Introduction to materials - Wood





the dowels in are made by a drill.

Year 7 Unit 6: Graphics - Infographic



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Glossary

Material(s)



Landlines: you call people from them. Usually one per household, maybe two but use the same line.



First mobiles: Text VEID' expensive messaging: and VERY big. you can keep You can cell from in touch by them on the go. sending text.



Ficture Message: You can now send black and white poselated images.



Colour: you have a Cameras develop: tiny colour screen. Better quality images and you can and cameras are send them to each starting to be other.

used.

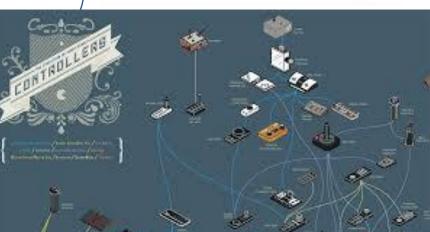


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Year 7 Unit 7: Textiles – Make do and mend



Glossary	
Material(s)	

Year 7 Unit 8: Programming - Tinkercad



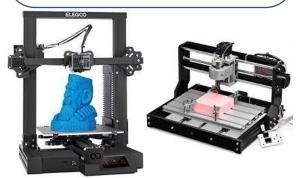
Glossary

C.A.D

Computer Aided Design is the use of computer software to communicate design solutions. This may take the format of technical drawing, electronic simulations or 3D modelling. The major benefit of CAD is the time saving and ease of changes. Any changes would have taken a traditional draughtsman hours to make whereas CAD software allows immediate changes. Several drawings can also be linked so that changes on one drawing will appear on multiple, again a huge time saving on traditional methods.

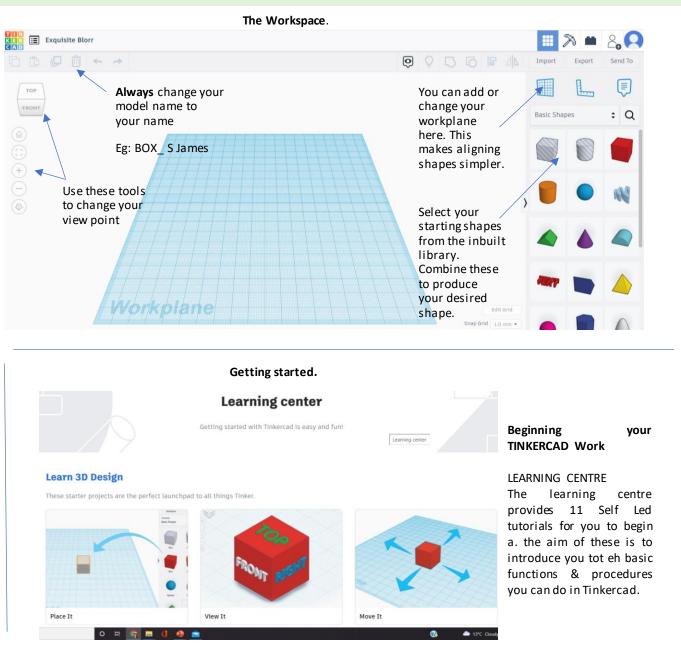
C.A.M

Computer Aided Manufacture used CAD files to programme computerised manufacturing equipment such as 3D Printers, laser cutters, CNC Machines, routers and milling machines. They operate using code which the software feeds to it from the drawing. Some CAM machines work by adding material, and some work by removing material.

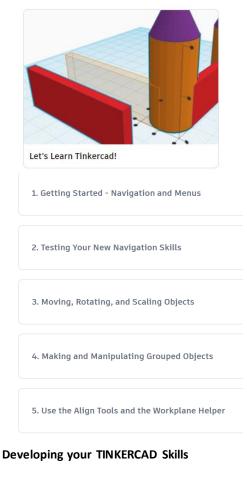


3D Printers **ADD** material to produce the product.

Millingmachines**REMOVE**materialtoproduce the product.



Developing your skillset.



The five 'lesson' here will take approximately 2 hours to complete. You can stop and continue as you please- your progress will be recorded ready for the next time you log in.

Year 8 Unit 1: Health and Safety





Health and Safety

NOUN BRITISH

•regulations and procedures intended to prevent accident or injury in workplaces or public environments.



Why do you think workshop Safety Rules are important? If everyone follows workshop rules, everyone will be safe and learn how to use tools and equipment properly and

efficiently.

The right attitude for a workshop Safety Declaration read understood and signed WHEN USING ALL LOOSE CLOTHING TUCKED IN SAFELY. E G TIE

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Year 8 Unit 2: Graphics - Iconic Product Design

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Glossary

Iconic Design

An iconic design is usually a design that is 'ground breaking' and one that sets new standards in its field. It is a design that other designers and manufacturers follow, as it becomes a bench mark for other similar products. Furthermore, an iconic design is one that stands up to the test of time, remaining a good design, despite the passing of years, decades and even centuries.

What makes a brand iconic?

But for a brand to be trulviconic, it needs to reach out to its audience on multiple levels. The product or service needs a good tone of voice, tell a gripping story, evoke emotion, and be memorable. Some of the most successful and globally perceived brands have become iconic for positive reasons.

Iconic Designers

- 1. Jonathan Ive, UK
- 2. James Dyson, UK
- Charles and Ray Eames, USA 3.
- Deiter Rams, Germany 4.
- 5. Achille Castiglioni, Italy
- 6. Marc Newson, Australia
- Arne Jacobsen, Denmark 7.
- 8. Marcel Breuer, Hungary
- Giorgetto Giugiaro, Italy 9.
- 10. Philippe Starck, France
- 11. Karim Rashid, USA
- 12. Zaha Hadid, Iraq
- 13. Frank Lloyd Wright, USA
- 14. Noto Fukasawa, Japan



Deiter Rams





Achille Castiglioni







Philippe Starck

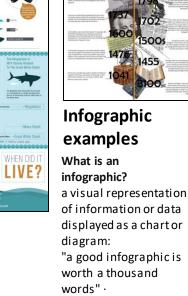
10 most influential Product Designers of all time - RTF | Rethinking The Future (re-thinkingthefuture.com)

Who are the 10 most influential Product Designers of all time?: DesignWanted

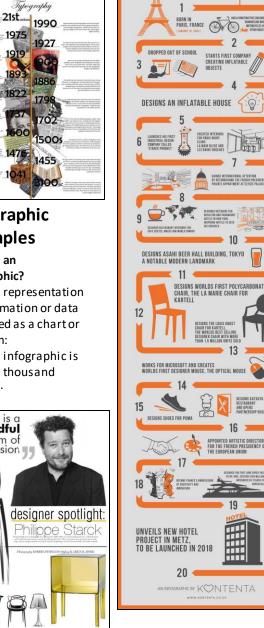




Learn something r







Year 8 Unit 3: Biomimicry, smart & modern materials



Glossary

BIOMIMICRY

Biomimicry is the art of mimicking nature. This means using naturally occurring features of plants and animals to inspire a material or product.

SMART MATERIALS

To be dassed as a 'smart material' they need to exhibit a physical change in response to some external stimuli. Such as stress, moisture, electric or magnetic fields, light, temperature, pH, or chemical compounds. The change should be reversible.

MODERN MATERIALS

Modern materials are materials which have been modified and developed to improve their properties. This may include the method which the material is made to produce lighter materials with the same strength properties or coasting the material in a nanomaterial (very thin) to improve it's performance.



Using a Kingfisher's head and bill profile as inspiration, the redesigned Japanese bullet train created less drag and friction when travelling and didn't create a sonic boom on exiting tunnels.



The bone structure of a woodpecker is used as an inspiration for an ice pick.



Burrs have very tiny hooks on them. The Burrs stick to fur and clothing by hooking themselves onto the fibres. These tiny hooks are the inspiration behind Velcro.

SMART MATERIALS

Polymorph is a thermoplastic material that can be shaped and reshaped any number of times. it is normally supplied as granules that look like small plastic beads. In the classroom it can be heated in hot water and when it reaches 62 degrees centigrade the granules form a mass of 'clear' material. When removed from the hot water it can be shaped into almost any form and on cooling it becomes as solid as a material such as nylon. Although expensive, polymorph is suitable for 3D modelling as it can be shaped by hand or pressed into a shape through the use of a mould.







MODERN MATERIALS

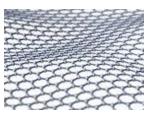
Cornstarch Polymers- an alternative to fossil fuel-based polymers. Cornstarch polymers are biodegradable and becoming more and more popular with manufacturers for their packaging. They are not recyclable but they are biodegradable.





Flexible MDF is made in a similar way to standard MDF except grooves are cut across the board. This process allows the MDF to be bent yet still regains it's strength. Very popular to create more 'organic' shapes.

Graphene, discovered and developed at the University of Manchester, is the thinnest, strongest and most conductive material known. It is ultra thin layer of graphite just one atom thick.





Nanomaterials are exceptionally thin materials. The are used in electronics to improve conductivity and allow the production small of verv components. In the textiles industry they can add protective coatings to improve water resistance, UV protection and improve anti-bacterial protection in footwear.

Smart materials - Developments in new materials - AQA - GCSE Design and Technology Revision - AQA - BBC Bitesize

Year 8 Unit 4: Revisit Materials - Wood and Plastics

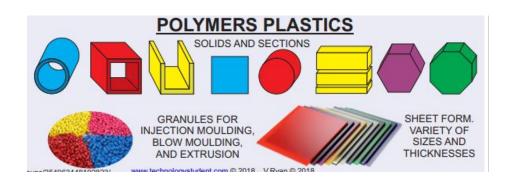


Glossary

Health and Safety







Year 9 Unit 1: Health and Safety



Glossary



Health and Safety

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Year 9 Unit 2: Sustainability and the 6R's



Sustainability

Is the avoidance of the depletion of natural resources in order to maintain an ecological balance: Eg: if a tree is cut down for paper, another tree is planted in its place.

6 R's Rethink Refuse Repair Reduce Re-use Re-cyle

Impact on sustainability

Greater consideration is now given to ensuring that the materials and energy we use are **sustainable**. This includes where the resources come from and how they are disposed of at the end of their life.

Finite resources

Finite resources are **non-renewable** and will eventually run out. Metals, plastics and **fossil fuels** (coal, natural gas and oil) are all examples of finite resources. Finite resources are popular as they are easily accessible due to strong supply chains and often have benefits for manufacturing particular products or for energy supplies. Companies have become more careful in their use of finite resources, and they now consider the **ecological footprint** caused by using such materials.

Non-finite resources

Non-finite resources are found naturally and can be replaced. Examples include wood, cotton and **renewable energy** sources such as solar and wind. Where trees are cut down for wood or hibiscus plants **harvested** for cotton, new ones can be planted in their



Plastics challenge - Practical Action

6Rs - Practical Action

Waste disposal

How materials and resources are disposed of is carefully monitored and managed by local councils. Households are encouraged to recycle waste items where possible, including products made from various materials such as hard plastics, paper and steel. Natural garden waste can also be recycled. In 2016, the UK recycled 25 per cent of household waste, with the target of 50 per cent in 2020. All other waste goes to **landfill sites**, which release harmful gases that pollute the surrounding air and soil.



ST TERESA of CALCUTTA

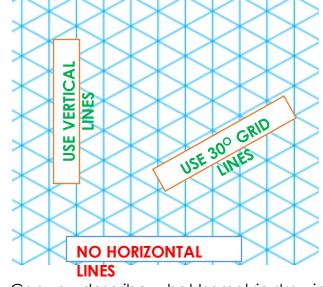


Year 9 Unit 3: Technical Drawing





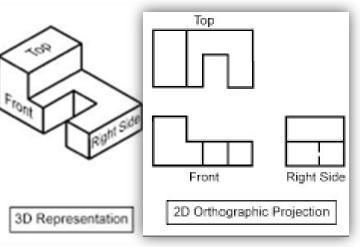
ISOMETRIC



Can you describe what Isometric drawing is?

What are the rules you need to follow to create a realistic 3D design in Isometric format?

ORTHOGRAPHIC



Can you describe what Orthographic drawing is?

What are the rules you ned to follow to create an accurate TOP, FRONT & SIDE view?

Year 9 Unit 4: Architecture

Glossary Health and Safety

Specialist buildings Smart technology has improved the efficiency of buildings, with many factories using **renewable** energy sources to try to minimise environmental impact. Modular buildings can be erected quickly and at a low cost, and improvements in stock control mean less storage space is needed.







Year 9 Unit 5: Crazy Contraptions



Glossary

Health and Safety