Year 7 Design Technology Need to Know

1 Industry & Enterprise:


Coping saw


Hacksaw


Tenon Saw

Fairtrade is about better prices, decent working conditions and fair terms of trade for farmers and workers in less economically developed countries.

- Bananas
- Cocoa beans (chocolate)

2 Sustainability & People

We must take responsibility for how we dispose of our products. They could be recycled or end up in landfill.

Technological push is when a new technology is developed and then pushed into market creating new products.

Market Pull is when there is a problem identified by a consumer group driving new technology to be used to solve with a product.

3 Culture & Society

Products evolve over time due to:
New technology
Fashion/style
Consumer need
New materials
New manufacturing



Anthropometrics
Is the measurements and limitations of the body such as:

- Hand sizes
- Reach

Ergonomics
Is about how a product or environment interacts with a user.
Physical/mental/cognitive

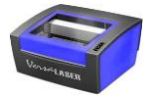
4 Environment, Production Techniques & Systems, Analysis

Designers and manufacturers must ensure they try to reduce the amount of pollution they produce by making products. Creating CO2, methane and other greenhouse gasses contributes towards global warming which raises the earths average temperature

CAD – Computer Aided Design

CAM – Computer Aided Manufacture


3D Printer

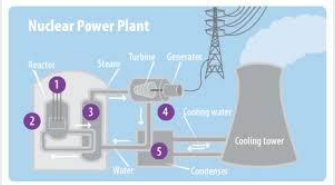

Laser cutter

5 Fossil Fuels & Nuclear Power

Fossil fuels are resources that cannot be replaced after we convert them into energy for fuel. They include:

- Gas
- Oil
- Coal

Nuclear power is a method of producing energy where a nuclear reaction is created inside a controlled vessel to produce vast amount of heat which generates power



6 Renewable Energy & Energy Storage Systems inc Batteries

Wind is a renewable source of energy that we can harvest by using the wind to rotate a turbine which converts this energy into power through a generator.

Kinetic energy is the energy involved in motion. Any object in motion has kinetic energy – a ball thrown, a person walking an object falling.

7 Modern Materials & Smart Materials

Modern materials are new materials or new ways of working with a material.

Corn starch polymers are biodegradable plastics made from corn or potato starch.
Uses: Disposable cutlery, food packaging, pens, 3d printing

Smart materials change their properties to react to a stimulus such as heat

Thermochromic inks change colour with a change of temperature.
Uses: Baby products, novelty mugs, packaging, strip thermometers

8 Composite Materials & Technical Textiles

Composite materials are a combination of materials to improve properties

Glass Reinforced plastic (GRP) glass fibres combined with a plastic resin which sets hard. Uses: oat hulls, car and truck body parts, seating, helmets.

Technical textiles are fabrics that have enhanced properties to withstand specific uses.

Kelvar is a material that has a high tensile strength to weight ratio. It can withstand heat and impact. Uses: Body armour: bullet proof vests, motorcycle clothing, extreme sports equipment.

9 Inputs, Processes & Outputs

For a system to be controlled it needs an input, this could be manually controlled or to sense an environment change such as light. Examples – toggle **switch**, push to make switch, push to break switch

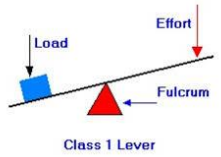

Output components are used to give off a stimulus such as heat, light sound

Light emitting diode (LED)

10 Types of Movement & Changing Magnitude and direction of Force

Linear motion is movement in one direction along a straight line. For example a train or a 100m sprint runner

A lever is a simple mechanism to gain mechanical advantage to help lift or move things easily.



11 Paper and Board & Natural and Manufactured Timbers

Bleed proof paper
Used for sketching and using marker pens

Corrugated cardboard
Used for packaging electronic or heavy items. Impact protection

Timer is available in 3 categories

- Hardwood (oak)
- Softwood (pine)
- Manufactured board (plywood)

12 Metals and Alloys, Polymers & Textiles

Ferrous metals contain iron.


Low carbon steel

Thermoplastics can be reshaped with heat


Polypropylene (PP)


Cotton

Plant based fabrics are made from plant fibres spun into yarn

13 Material Properties

Physical properties

Absorbency – the tendency to attract or take an element, usually liquid but could include light or heat

Mechanical properties

Strength – the ability of a material to withstand a force such as pressure or tension

Hardness – the ability to resist abrasive wear and indentation through impact

14 Selection of Materials and Components, Forces and Stresses & Ecological and Social Footprint

Compression occurs when a pushing force is applied to either end of a material

Carbon footprint refers to the amount of Co2 produced by a product, person or a company

15 Sources and Origins, Using and working with Materials & Stock Forms, types and sizes

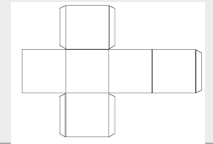
Forest stewardship council is a mark that means wood/paper has come from a sustainably harvested source

Paper comes in the following available stock forms:

- A0/A1/A2/A3/A4/A5 etc.
- Gsm weight
- Microns (thickness)
- Colours
- Ply (layers)

16 Scales of Production, Specialist Techniques and Processes & Surface Treatments and Finishes

Die cutting is a process where paper or card is cut into a shape or net. This can cut and score to fold the card into the desired shape such as a packaging net



Batch production is a scale of manufacturing where a certain number of identical products are required. This could be small or large numbers.