

Unit 1

1a - Core Skills

2D drawing techniques

 **Freehand Sketches** is drawing freely without a ruler.

 **Ghosting** is using 'join the dots' technique.

 **Ellipse** is drawing a circle using axis points in a square.

 **Isometric drawing** is presenting drawings in 3D.

 **Crating** is drawing 3D objects inside a crate/wireframe.

 **Rendering** is colouring a design to make it look realistic like a material.

 **Annotation** is adding written explanations to designs

 **Modelling** is making 3D mock ups to test how a product looks & performs.

1b - Maze Game

Key Concepts in Techsoft 2D Design

 **Line tool** - draw straight lines of various lengths and angles

 **Shape tools** - Create shapes like rectangles, circles, ellipses, squares

 **Text tool** - Add text to your design

 **Select and move tool** - select & move objects within your design. Use for rearranging elements.

 **Rotate and scale tool** - Rotate and resize precisely.

 **Mirror tool** - Create mirrored copies of objects, which is useful for symmetry in designs.

 **Grid tool** - The grid helps align objects, and the snap feature ensures objects snap to grid points for accuracy.

 **Zoom and pan** - These tools allow you to navigate and focus on specific parts of a design.

 **Dimensioning tools** - Add dimensions/measurements to objects, adding precise information about the design.

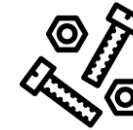
Advantages of MDF

- Affordability
- Versatility
- Consistency
- Machinability
- Accepts finishes



Disadvantages of MDF

- Durability
- Weight
- Moisture sensitivity
- Limited outdoor use
- Not for structural use.



Standard components are the same shape and size, so they can easily fit together & work in different products. E.g. screws, nuts and bolts.

1c - Jewellery

 **Design Specification** is a list of criteria a product needs to address. If the criteria are measurable, it makes it easier to later test how effective the design ideas are.

 **The work of others** also known as Designer/s research; is where you analyse and evaluate the work of the past and present to help inform your designing.

 **Evaluation** Is where designers evaluate their finished prototypes in order to test if they work well and if the design can be improved. Designs are also evaluated against the specification.



Using CAD/CAM

Advantages	Disadvantages
-Consistent -Accurate -Easy to edit & share	-Training needed -Expensive to buy -Expensive to repair

Metal Categories



Ferrous metals contain iron and are magnetic. They are prone to rust.



Non-ferrous metals do not contain iron and are not magnetic. They do not rust.



Alloys are mixtures of metal with an element to improve its properties or aesthetic.



Pewter Casting Process before casting a mould is made. Moulds are secured together & then molten pewter is poured in to take shape of the mould design.

1d - Eco Design



Eco design is a way of looking at design with a focus on the environmental impacts of the product during its whole **lifecycle**.



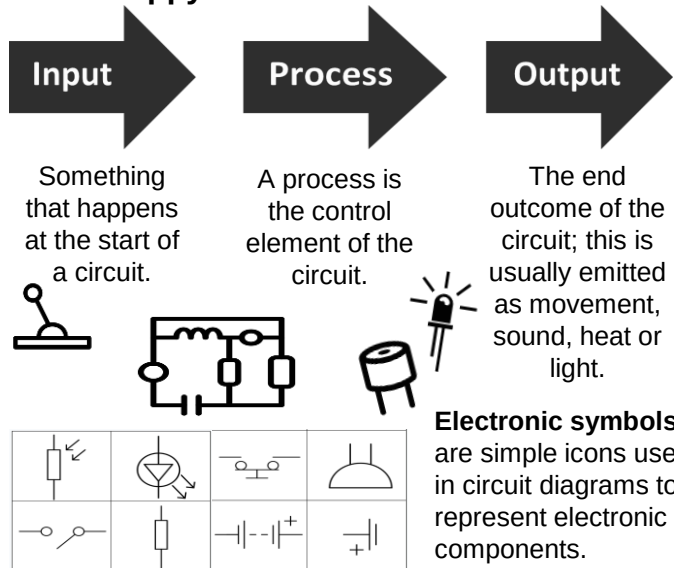
'Cradle to Grave' is a products life cycle & its impact on the environment. Looking at the product from the original material sourcing to the end of its life.



The Six R's of sustainability are: **Reuse, Recycle, Reduce, Refuse, Repair, Rethink**. These summarise approaches that can be taken by the consumer, the designer, the manufacturer & the retailer to be more environmentally friendly.

Unit 2

2a - Scrappy Circuits



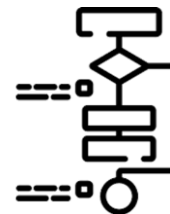
2b - Robotics - Crumble

An **algorithm** is a list of rules to follow in order to complete a task or solve a problem

Coding in D&T involves giving your computer step-by-step instructions to control machines and software to perform specific functions.

Programming blocks are like jigsaw pieces with a specific action written on them. You put these pieces together to give instructions to a computer and create a program.

Crumble is a simple electronic device that helps you control lights, motors and other components.

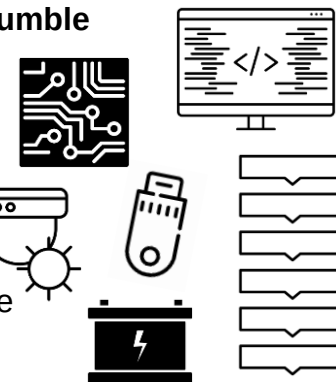


In digital electronics, inputs and outputs are represented as **0** for off and **1** for on.

In crumble this is represented as **HI** (on or +) and **LO** (off or -). HI is the equivalent to 4.5-5.5 volts and LO is 0 volts, it is used to turn inputs and outputs **on** (HI) or **off** (LO)

Setting Up The Crumble

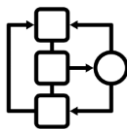
- Crumble Board
- Switch
- Buzzer
- Light Sensor
- Battery Pack
- Sparkle
- Micro USB Cable
- Croc Leads



2c - Jitterbug

A **plan of manufacture** or production plan outlines the step by step process of how to make a final product.

This should include:
Process. Tools. Materials
Quality Control Checks
What to do if a check fails



Soldering is a process in which two or more metal items are joined together by melting and then flowing a filler metal into the joint - the filler metal having a relatively low melting point.

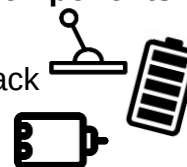
- Soldering is used to form a **permanent connection** between **electronic components**.
- The metal to be soldered is heated with a **soldering iron** and then solder is melted into the connection.
- Only the solder melts, not the parts that are being soldered.
- Solder is a metallic "glue" that holds the parts together and forms a connection that allows electrical current to flow.

Manufacturing Process

A **vacuum former** is used by created a mould, this is what the plastic will form around. Moulds can be made from a variety of materials. The mould is placed into the vacuum former with the plastic above it. The plastic is then heated. The mould is moved towards the plastic and the vacuum is switched on, withdrawing the air from around it which shapes the plastic.

Electronic Components

- Switch
- Battery Pack
- Motor



2d - Music Player

During the last 40 years the way we store and listen to music has changed beyond recognition, from vinyl to chip.

Reel to Reel

The technology of recording onto tape originated in 1886 with the first product patented in 1909.

Product Evolution

Magnetic Tape
Compact Cassettes
Cassette Players

Iterative Design: Apple releases large, innovative products into the world, and then makes small iterations on them, again and again, so they get better and better.

Music Evolution



Unit 3

3a - Practical Skills Building



Kitchen Hazards refers to dangers which occur in the kitchen that could lead to an accident or an injury.



Personal Hygiene is how you care for your body ensuring you are clean and ready to prepare food.



Food Poisoning is an illness caused by pathogenic microbes in food.

Safety Cutting Techniques

Claw Bridge



The 4 C's of Food Safety

-Cooking -Cross Contamination
-Cleaning -Chilling



3b - Catering For Needs



Function of food: Food provides the body with energy and these basic life processes account for the 75% of the energy we use each day. Insufficient intake of energy can lead to malnutrition. Having too much of something is in excess or not enough is deficiency.



PAL - Physical Activity Level: Different people have different activity levels. PAL is a measure of how active you are or how much exercise you get. If you are more active, e.g. a gymnast, you will have a higher PAL than some with a sedentary lifestyle.



Food intolerance: is caused by your body not being able to digest a certain food or an ingredient in food. Some common food intolerances are to Lactose (sugar in milk) and Gluten sensitivity – Coeliac disease (protein in wheat)



Food Allergies: is where your body reacts to certain foods. It's often mild, but can be very serious for some people. People with allergies can have allergic reactions to certain foods and can go into anaphylactic shock which can be fatal.



Common allergens: substances that can cause allergic reaction. Some listed below:
Mollusc, egg, fish, lupin, soya, milk, mushroom, gluten, crustaceans, mustard, nuts, sesame, celery

3c - Design For Health

Factor

A circumstance, fact, or influence that contributes to a result e.g price could be a factor

Market Research

Gathering information about consumers' needs and preferences.

Success Criteria - Meals For a Teenager

The following criteria are to be used when planning your meal for a teenager:

- Use at least two portions of vegetables
- Use ingredients from meat, fish, eggs, beans or other non dairy source of protein
- Use ingredients from the bread, rice, potatoes, pasta & other starchy food group
- Cost less than £1.00 to make
- Appeal to teenagers
- Able to be made in an hour



Factors Affecting Food Choice

- Likes & dislikes
- Cooking skills
- Food Availability
- Money to buy ingredients
- Time to make meals
- Choice in shops
- Family Traditions
- Temptations
- Emotions

Nutrients

Good nutrition fuels the body.

- Carbohydrates
- Proteins
- Fats
- Vitamins
- Minerals
- Water



3d - Future Food



Global warming; the long-term heating of the Earth's surface due to human activities, primarily fossil fuel burning, which increases heat trapping greenhouse gas levels in Earth's atmosphere which in turn increases the temperatures on Earth with devastating impacts.



Environmental Impact; food production impacts the environment by its transportation, industrialisation, deforestation, electricity use and factory farming.



Food miles; a way of measuring how far food has travelled before it reaches the consumer. It is a good way of looking at the environmental impact of foods & their ingredients.