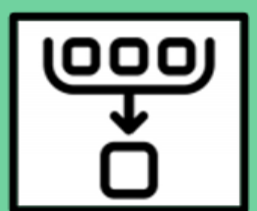
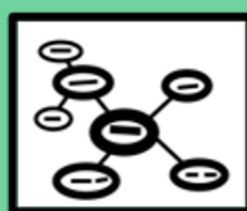


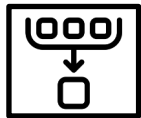
Year 7

Design and Technology HOMEWORK



1. Keywords spelling/definition test.

C.A.D	C.A.D stands for Computer Aided Design , this means that a design is drawn in either 2D or 3D using a computer program such as 2D design, AutoCAD, Onshape or any other software that allows you to create a drawing using a computer.
C.A.M	C.A.M stands for Computer Aided Manufacture . Computer aided manufacture (CAM) involves using computers to control machines to produce 3D parts or products. By using CAM, designs can be created using CAM machines such as laser cutters, 3D printers and milling machines.
C.N.C	Computer Numerical Control (CNC) machining is a manufacturing process in which pre-programmed computer software tells computer operated machinery what to do and what to cut or engrave. This means that the computer does all the work rather than a person. This can save time and money but takes skilled users to write the computer program. The process can be used to control a range of complex machinery, from grinders and lathes to mills and CNC routers.



2. Advantages and disadvantages of C.A.D



Advantages of CAD	Disadvantages of CAD
Ideas can be drawn and developed quickly	Expensive to set up
Designs can be viewed from all angles and with a range of materials	Needs a skilled workforce
Some testing and consumer feedback can be done before costly production takes place	Difficult to keep up with constantly changing technology



3. Advantages and disadvantages of C.A.M



Advantages of CAM	Disadvantages of CAM
Fast and accurate production	Expensive to set up
Machines can run constantly on repetitive tasks	Needs a skilled workforce of engineers
Good for producing on a mass/flow production line	Downtime required for maintenance
Less material wastage	Computers and machines can fail
Machines can run 24/7	Errors can happen if they are not monitored.

Challenge!

Nasa wants to use 3D printers to design and make houses on other planets – Design a house that could be 3D printed for families to live in on the moon. Colour and label your design.

4. The Laser Cutter



A laser cutter is a high-precision CAM machine that cuts a wide variety of materials using an extremely powerful laser beam directed onto the material using angled mirrors. The power setting can be varied - if the power is reduced or the speed is too high, then the laser beam will not cut completely through the material and will engrave it instead.

6. The CNC Router



A CNC router is a type of computer-controlled machine created for milling, drilling and cutting materials. The main functions of a CNC router are to cut, engrave and carve objects out of a work piece, such as Wood, plastic or metal.

5. The 3D Printer



3D printing, also known as additive manufacturing, is a method of creating a three-dimensional object which is made by adding layer-up on-layer of a specific material such as plastic. (PLA) using a computer created design. (CAD)



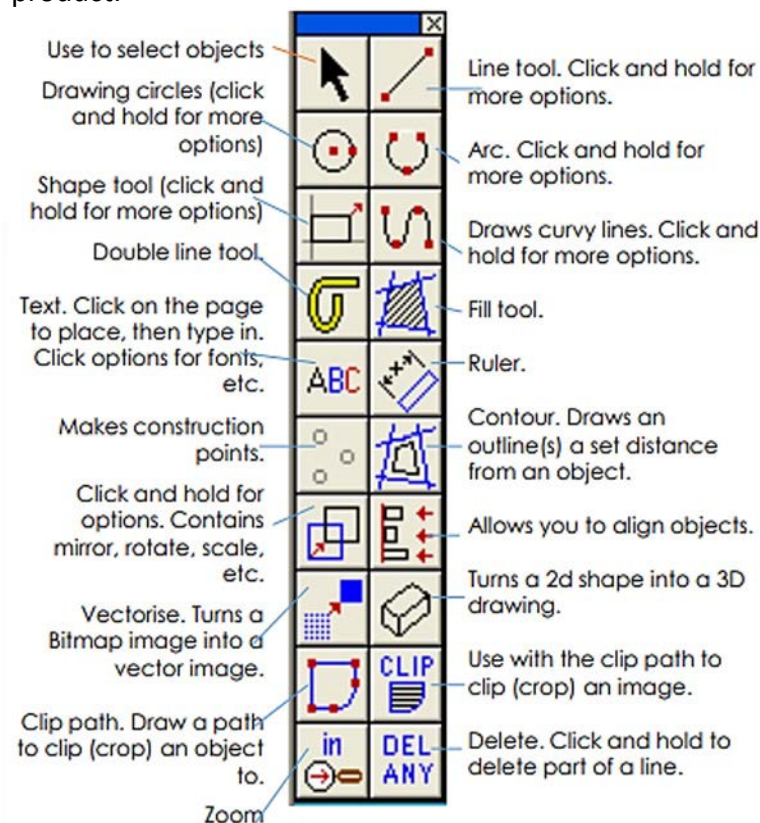
Challenge!

Research 5 things a 3D printer can make.

7. 2D Design – Computer Aided Design Software

The software that you will use to design and make your work in your Computer Aided Design and Manufacture lessons will be 2D Design (made by Techsoft)
This is an easy-to-use software that can produce drawings that can be cut using CAM equipment.

These are the drawing tools that will help you draw your product.

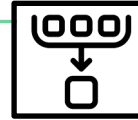


1. Keywords spelling/definition

Die cutter	A piece of machinery that can cut multiple copies of a piece of packaging. Like a cookie cutter.
Mood board	A page that shows colour/ images/ fonts/ logos etc of your chosen theme
Race and chase game	a style of board game where the winner is the first to the finish line.
Assemble	To put something together such as counters or packaging.
Net	A flattened piece of packaging that shows the cut lines, fold line and tabs.
Instructions	The step-by-step details on how to play the game.
Manufacture	How the product is made or put together to create the finished product.



2. Facts about Logos



A logo is a graphic mark, emblem, or symbol used to aid and promote public identification and recognition. It may be of an abstract or figurative design or include the text of the name it represents as in a wordmark.



These logos are examples of successful logos, they are clear, feature no more than 3 colours and stand out. You can recognise the brand without seeing the name of the brand. This makes them universal and can be understood across the world without needing to change the names into different languages.

Challenge!

Design a new logo for Design and Technology, think about the symbols and the colours that you will use.

3. Facts about Fonts

The word '**font**' refers to a set of printable or displayable typography or text characters in a specific style and size. Font styles are used in both print and digital text. It is the style of writing that you use either by hand or using a computer.

Font Types

Serif. Traditional, have feet. <i>Script.</i> Cursive, a bit more decorative.	Sans Serif. Modern, feet free. DISPLAY Decorative, good as a design focal point.
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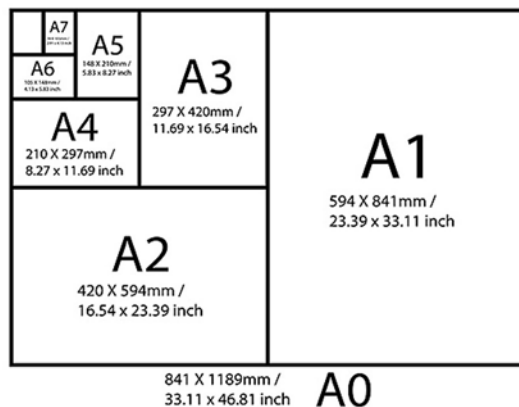
The most recognizable fonts used today on computers are

Arial	Tahoma
Times New Roman	Helvetica
Stylus	ONYX
Gothic	Revie
Courier	Nyala
<i>Script</i>	broadway
	CASTELLAR



4. Paper and Board Stock sizes and weights

Paper and board is available in sizes from A0 (biggest) to A7 (smallest). The most common size is A4. Each size is half the one before, e.g. A4 is half the size of A3.



They are also sold by weight: GSM – grams per square metre. Card thickness or calliper is traditionally measured in Microns. 1000 Microns = 1mm, so the higher the value, the thicker the card or paper



5. What is a Net?

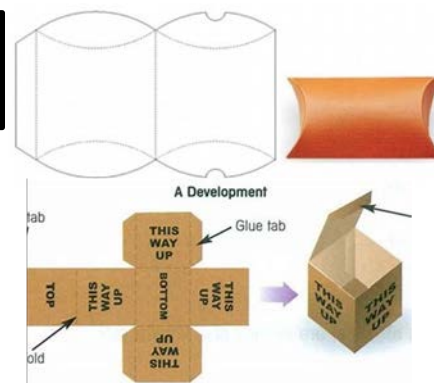
A NET is a two-dimensional (2-D) shape, which when scored, folded and glued together, makes a three-dimensional (3-D) package, box or carton.

NETs must be made ACURATELY so that all the sides fit together perfectly.

The design must be printed the correct way up so that when the box is constructed, everything is the right way up.

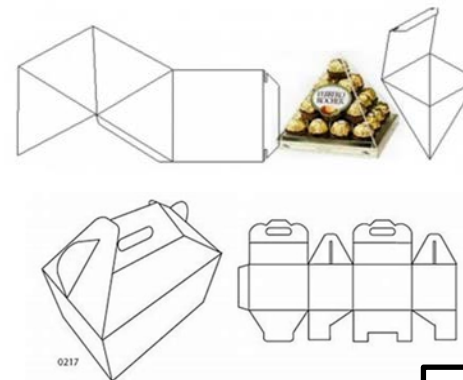
A standard set of line types are used to draw NETS, these help the nets be cut and scored and folded in the correct places.. Nets are sometimes also called DEVELOPMENT nets

PILLOW PACK



6. Examples of Nets

PYRAMID BOX

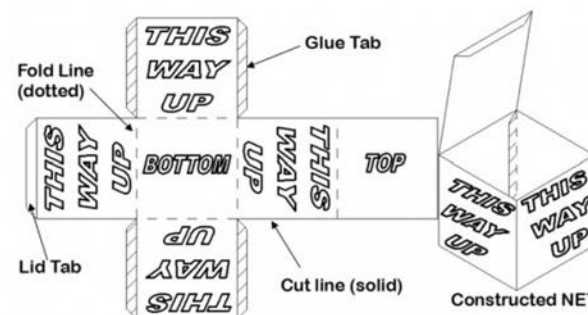


7. Net construction lines

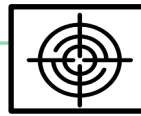
A NET needs different types of lines to turn the 2D shape into a 3D shape.

Cut lines are seen as solid lines

Fold lines are seen as dashed lines



1. Key vocabulary and definitions



Pine: an evergreen coniferous tree which has clusters of long needle-shaped leaves. Many kinds are grown for the soft timber, which is widely used for furniture

Tenon Saw: A Tenon saw has a relatively short blade with a reinforced back providing stability. It has hard point teeth and creates a fine finish so is ideal for carpentry as it makes a straight, precise cut

Scroll saw: A scroll saw is a small electric saw used to cut intricate curves in wood, metal, or other materials.

Try square: A try square or try-square is a woodworking tool used for marking and checking 90° angles on pieces of wood.

Dowel: A dowel is a cylindrical shape made of wood, plastic, or metal. In its original manufactured form, a dowel is long and called a dowel rod.

2. Product Analysis

A: Aesthetics – This is where you would look closely at the way the product looks, thinking about areas you consider successful and areas you would change.

C: Cost – How much is the product being sold for? Is it a suitable price?

C: Client – All products are created with a specific user in mind – has the designer been successful?

E: Environment – Has the product been made with the environment in mind? Can it be repaired? Recycled? Reused? Etc.

S: Size - How big in the product? Is this size suitable?

S: Safety – Is the product safe to use?

F: Function – What has the product been designed to do? Does it do this successfully?

M: Materials – What has the product been made from? Is it a suitable material? Are there alternatives that would be better?



3. Health and safety



Everybody is responsible for health and safety.

It is your job to make sure you are following the rules and working as safely as you can. This protects both yourself and others around you.

1. Always listen carefully to instructions
2. Walk calmly around the room
3. Do not shout or raise your voice, a quiet room is a safe room
4. Do not touch any equipment you have not been given permission to use
5. Keep your work area tidy
6. Keep bags on the shelf
7. Hang coats and blazers on pegs
8. Pile stools up out of the way
9. Always wear long hair up when completing practical work
10. Always wear the correct PPE – apron, safety glasses

4. Annotation

Annotation: a short explanation or note added to a text or image.

When we design a product, the drawings alone cannot give enough information for others to understand our ideas. It is essential we explain them through annotation.

The purpose of annotation is not to put into words what the viewer can see, but a method used to give more information about the idea.



The robot has a green face



The robot has a green face because it eats the leaves of the matcha plant. The strong green dye contained within makes his face turn green.

5. Timber theory



Softwood is a term used to describe timber sourced from coniferous or needle-leaved trees. Hardwood is sourced from deciduous and evergreen broad-leaved trees.

CEDAR

The most common type of cedar is western red. As this name implies, it is pinky, red in colour. It is relatively soft but straight grained and is mostly used for outdoors for furniture, deck handrails, wall cladding and window frames because it resists rotting in moist environments. Relatively inexpensive.

ASH

Ash is a white-to-pale brown-coloured wood with a straight, attractive grain. Easy to work, it is commonly used in furniture production where it is a good substitute for white oak.

OAK

Used for centuries throughout Europe, particularly in England, oak is still one of the most sought-after woods for furniture. Available in red and white, the latter is preferred because it has a more attractive figure than American red oak and is resistant to moisture, which allows it to be used for outdoor furniture. English oak is regarded as superior to American white oak.

6. Type of motion

Linear motion moves something in a straight line, eg a train moving down a track:



Rotary motion is where something moves around an axis or pivot point, eg a wheel:



Reciprocating motion has a repeated up and down motion or back-and-forth motion, eg a piston or pump:



Oscillating motion has a curved backwards and forwards movement that swings on an axis or pivot point, eg a swing or a clock pendulum:



7. Pine

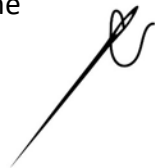


Advantages of Pine	Disadvantages of Pine
Inexpensive – Costs less than most other wood types.	Defects – Common lumber frequently has structural or visual flaws.
Self-reliant – Strong enough that it does not require reinforcement.	Knots & Flaws – Contains imperfections that can hurt appearance and strength.
Lightweight – Easy to handle, cut, and work with.	Soft Surface – Easily damaged; highly susceptible to scratches and dents.
Stable – Naturally resists shrinking and swelling.	Low Durability – Significantly less durable than hardwoods.
Elastic – Offers good natural flexibility and elasticity.	Warping – Prone to twisting and warping if not properly dried and cured.

1. Equipment you will use

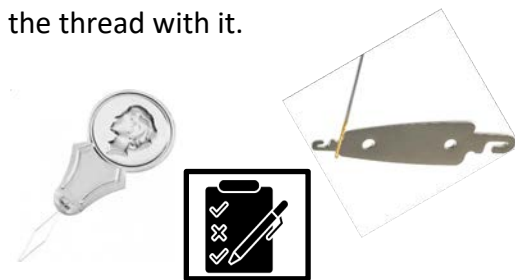
Needle:

A tool used for hand-sewing, it is a long slender tool with a pointed tip at one end and a hole (or eye) to hold the sewing thread.



Needle threader:

Used to help you to thread the needle. Lots of different types but they all work the same way. The threader is pushed through the eye of the needle first then the thread is attached to a hook or wire loop. These are then pulled back through the eye of the needle pulling the thread with it.



2. Materials and techniques

Thread:

A fine length of twisted fibres used to join fabric together. Comes in different colours. Need to use a needle threader to pass the thread through the eye of the needle.

Embroidery:

Embroidery is the craft of decorating fabric or other materials using a needle to apply thread or yarn.



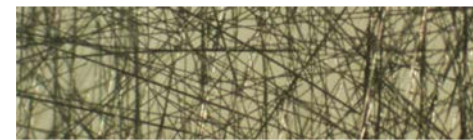
Applique:

Appliqué is a decorative technique in which pieces of fabric in different shapes and patterns are sewn onto a larger piece to form a picture or pattern.



3. Fun Felt Facts!

Felt is the oldest known fabric and is known as a non-woven fabric. Fibres run in all directions.



Most types of fleece, such as those taken from the alpaca or the Merino sheep, can be put through the wet felting process.

You may also use mohair (goat), angora (rabbit), or hair from rodents such as beavers and muskrats.



Felt was involved in the phrase 'As Mad as a Hatter' because mercury used in the hat making process caused insanity. Mercury was banned in 1941.

Modern felts are often synthetic made using petroleum-based acrylic or acrylonitrile or wood pulp-based rayon.

4. Woven fabrics

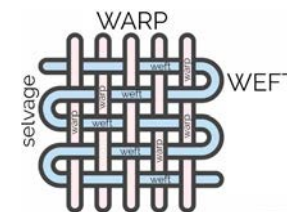
Woven fabrics are made up of Warp and weft threads.

Warp threads, also known as surface threads or ends, are stretched vertically on the loom and are therefore made of stronger, coarser fibres than the weft threads.

The term comes from the Old Norse word "varp", meaning "the cast of a net".

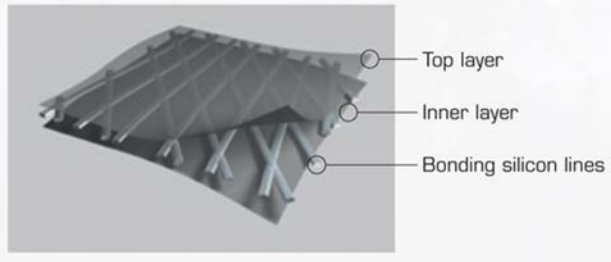
Weft, are the threads woven horizontally. The threads go over and under the warp. They usually run from selvage to selvage.

Selvage, is a "self-finished" edge of a piece of fabric which keeps it from unravelling and fraying.



5. Bonded fabrics

Bonded fabrics are made of two or more already-constructed fabrics held together by wet adhesives or thin polyurethane foam.



Bonding gives stability to lightweight, loosely woven fabrics.

Thanks to the bonding process by which this material is obtained, the adhesion between the components is very resistant, avoiding tears and breakages.

Bonded fabrics can mix textiles with other materials like rubber, plastic, or metal.

They are also used in many industrial applications such as automotive components, insulation products, and packaging.



6. The running stitch



The Running Stitch, also referred to as Straight Stitch, is one of the basic hand sewing and embroidery technique on which most other forms of stitching and embroidery are based.

The length of each stitch may vary depending on the purpose it is used for, but generally the thread is more visible on the right side (Front) of the fabric compared to the wrong side (Back).

It is one of the most popular stitches used for a wide range of purposes starting from garment making to embroidering various articles.

It is also used for appliqué making.

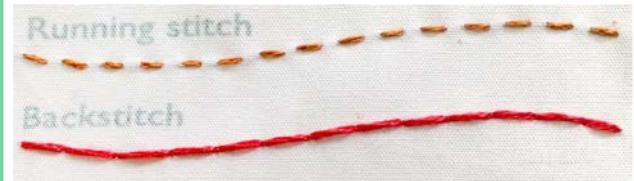


7. The back stitch

Back Stitch is made by taking the thread backward, rather than the conventional forward motion, and thus the name.

It can take curves well.

There are no spaces between each stitch, giving it a continuous appearance.



Like the **Running Stitch**, the Back Stitch also lays a foundation for many variations over it.

It is much stronger than the regular Running Stitch, though it uses more thread.

The Back Stitch looks beautiful when it uses small stitches and maintains consistency in the lengths.



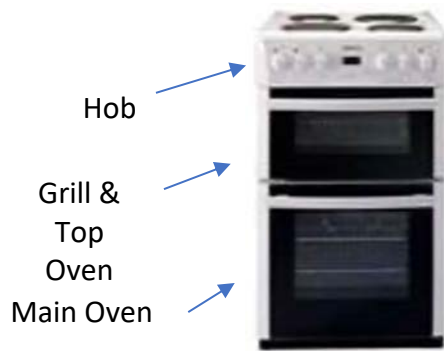
1. Key Words



Eatwell Guide – the guide which helps us eat the right sort of foods in the correct quantities.

Consistency – how thick or runny a sauce is in cooking (add liquid to make it runnier, boil longer or add something like corn-flour to thicken)

3. Parts of a cooker



5. The Rubbing-In Method

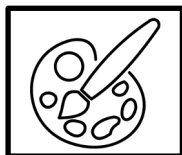
We used this method for the topping on our Fruit Crumble AND for making Scones. We will also use it in Y8 to make pastry.



Cover butter / margarine in flour - rub it between fingers and thumbs until it's 'breadcrumb' sized pieces.



2. Knife grips



Bridge hold



Claw grip

Use the correct coloured chopping board. Hold the ingredient flat against the board so it does not wobble. Cut with either the claw or bridge grip carefully. Push slightly forward and down with the knife.

4. 4 C's for Food Hygiene

Avoiding food Poisoning – it is important to follow the 4C's of food hygiene.

Raw meat is a **high-risk food** – this means it is more likely to give you food poisoning. This is because all living things contain bacteria that can be harmful in large numbers

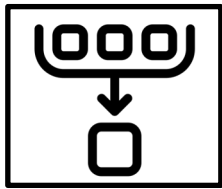
Clean: Wash your hands before cooking, make sure worktops and equipment are clean.

Cook: Cook food properly to kill germs. **Chill:** Some foods (like meat, fish and dairy) need to be kept in the fridge to slow the growth of bacteria.

Cross-contamination: Keep raw foods away from cooked foods otherwise bacteria will spread. Use separate chopping boards (**RED** for raw meat, **WHITE** for everything else) and equipment and wash them well after use.



6. The Eatwell Guide



The Eatwell Guide was produced by scientists for the UK government to help explain to the public what a healthy diet should be. You do not need to achieve this balance with every meal but try to get the balance right over a day or even a week.

Fruit & Vegetables: should make up just over a third of the food we eat each day. Aim for 5 portions & a wide variety. Choose from fresh, frozen, tinned, dried or juiced. Fruit juice and smoothies should be limited to 150ml a day. Good source of vitamins, minerals and fibre.

Starchy Carbohydrates: should make up a third of the food we eat. Choose higher fibre or wholegrain varieties, such as wholewheat pasta & bread, brown rice, or leave the skins on potatoes. Good source of energy and the main source of a range of nutrients in our diet.

Protein: Pulses, such as beans, peas and lentils, are good alternatives to meat because they're low in fat and they're a good source of fibre and protein, too. Choose lean cuts of meat and eat less red and processed meat (bacon, ham and sausages). Aim for at least 2 portions of fish every week, 1 of which should be oily (salmon, sardines or mackerel).

Dairy & alternatives: Good sources of protein, vitamins & calcium, for bones. Choose lower-fat and lower-sugar where possible.

Fats: High in energy and should be eaten in small amounts, unsaturated are healthier.

7. Utensils and Equipment



Sieve – to sieve flour



Saucepan – to cook on the hob



weighing scales



palette knife



baking tray

Design and Technology Notes and Reminders Page

