

Year 11 Half Term 2

Materials

Modern & Smart Materials			Papers & Boards		
1	<b>Smart Materials</b>	They change their properties in response to stimuli, e.g. temperature, light, stress, moisture or pH and return to their original state when the stimulus is taken away.	11	<b>Grid Paper</b>	Grid paper may have a square or isometric pattern printed on it.
2	<b>Shape Memory Alloys</b>	Alloys that 'remember' their original shape. They can be easily shaped when cool, but they return to their original shape when heated above a certain temperature.	12	<b>Bleed-Proof Paper</b>	Used by designers when drawing with felt-tips and marker pens. The ink doesn't spread out (bleed) — it stays put.
3	<b>Thermochromic Pigment</b>	Change colour reversibly in response to light.	13	<b>Layout Paper</b>	This paper is thin and translucent and is used for general design work — particularly sketching ideas.
4	<b>Photochromic Pigment</b>	They react to temperature so when the temperature changes, the product changes colour. The colour changes back when the object returns to its original temperature.	14	<b>Cartridge Paper</b>	This is high quality and has a textured surface. It is great for sketching with different drawing materials like pencils, crayons and inks.
5	<b>Modern Materials</b>	A modern material is a material that has been engineered to have improved properties.	15	<b>Tracing Paper</b>	This is semi-transparent and is used to copy images.
6	<b>Graphene</b>	A super-thin layer of graphite. It's incredibly light and strong and is a great conductor of heat and electricity.	16	<b>Foil Lined Board</b>	This board has an aluminium foil lining. It's often used to package food.
7	<b>Metal Foams</b>	A metal (e.g. aluminium) that contains many gas-filled spaces which make the material lightweight. They also keep some of the metal's properties too — they're stiff, tough, and strong under compression.	17	<b>Foam core board</b>	This is polystyrene foam between 2 thin layers of card. It's stiff, lightweight and the thin outer card layer can be scored.
8	<b>Titanium</b>	An extremely corrosion-resistant metal with a high strength-to-weight ratio.	18	<b>Duplex board</b>	This has a different colour and texture on each side. It's often used where only one surface is seen, so that only one side needs to be smooth for printing.
9	<b>Liquid Crystal Displays</b>	The liquid crystals used are made of a mixture of chemicals. When an electric current is applied, the crystal's shape is modified — this in turn changes the image seen on the screen. They are thin, lightweight and energy efficient.	19	<b>Corrugated card</b>	This is made up of a fluted inner core sandwiched between two outer layers (the liner), which can be printed on. The flutes add strength and rigidity.
10	<b>Composite Materials</b>	Composites are made from two or more different materials bonded together. They often have different (more useful) properties than those of the individual materials they're made from.	20	<b>Ink jet card</b>	This is a card used for ink jet printing. It's designed so that the ink doesn't bleed.

Metals			Electronic Systems		
21	<b>Ferrous Metals</b>	They contain iron and are magnetic. They are prone to rust and therefore require a protective finish, which is sometimes used to improve the aesthetics of the product it is used for as well.	32	<b>Block diagrams</b>	They are clear, simple diagrams showing all of the input, process and output elements that make up the system being designed.
22	<b>Non-Ferrous Metals</b>	They do not contain iron and are not magnetic. They do not rust.	33	<b>Flowcharts</b>	They are clear diagrams showing the individual steps that will take place in the process.
23	<b>Alloys</b>	They are mixtures of metal with an element to improve its properties or aesthetic. Non-ferrous metal may require a protective finish.	34	<b>Circuit diagrams</b>	Used simplified universal symbols to represent the electronic circuit and its components. A circuit diagram shows how the components are connected
<b>Plastics</b>			35	<b>Inputs</b>	Input devices take a signal from the physical or 'real world' and turn it into an electronic signal that processes the device.
24	<b>Thermoplastics</b>	They can be heated and shaped many times.	36	<b>Switches</b>	They allow current to flow through them when the contacts inside are joined together.
25	<b>Thermosetting Plastics</b>	They can only be heated and shaped once.	37	<b>Sensors</b>	They are used to detect changes in light level, temperature and pressure to turn a circuit on.
<b>Textiles</b>			38	<b>Process Device</b>	They take the signal from the input stage of a system and act on it by changing it in some way.
26	<b>Natural Fibres</b>	They come from plants, animals or insects. They are easily renewable and biodegradable.	39	<b>Semi-Conductors</b>	They control whether it is going to conduct.
27	<b>Synthetic Fibres</b>	They are made mainly from non-renewable coal and oil refined into monomers, which join together in a process called polymerisation. They do not degrade easily.	40	<b>Integrated circuits</b>	They are tiny chips that contain resistors, capacitors and transistors, which work together to complete the process they have been designed for, eg a timer, counter or microcontroller.
28	<b>Blended Fibres</b>	Blended fibres are mixtures of fibres that combine properties of two or more fibres.	41	<b>Microprocessors</b>	The main processor inside a computer is designed to be programmed to perform different functions.
29	<b>Woven Fabrics</b>	They are made by interlacing yarns on a loom. Fray easily when cut. Don't stretch much	42	<b>Outputs</b>	They allow a system to present information back into the 'real' world.
30	<b>Non Woven Fabrics</b>	They are made from fibres which have not been spun, weak, easily torn cheap to produce.eg. felt, interfacing.	43	<b>Light outputs</b>	When current flows through the filament it heats up and light is produced.
31	<b>Knitted Fabrics</b>	They are made from loops, stretches, loses shape, unravels easily, and are warm. Eg. Jersey, sweatshirting, fleece.	44	<b>Sound outputs</b>	Can be produced using buzzers or speakers.