

Bottisham Village College

KNOWLEDGE ORGANISER

PRODUCT DESIGN

ALL YEAR



KNOWLEDGE ORGANISERS

At Bottisham Village College, we are striving to create a five-year curriculum plan that builds effective revision strategies into homework and lessons, to ensure that students are able to place powerful knowledge into their long-term memories. Additionally, we hope that this will help build effective learning strategies from early in their time here at the college.

Based on evidence, we know that regular recall activities are the best way of achieving this goal and committing powerful knowledge into the students' memories.

At the start of each term, we shall publish all the knowledge organisers that students will require for their studies in each curriculum area. These will cover a range of aspects: facts, dates, characters, quotes, precise definitions and important vocabulary. We are clear: if this fundamental knowledge is secured, students can then develop their higher-level skills of analysis and critical understanding with greater depth.

They will be given an electronic A4 Knowledge Organiser (KO) booklet for each term containing all of the knowledge required. In lessons, Bottisham staff will be regularly testing this fundamental knowledge, using short-quizzes or even more formal "Faculty Knowledge Tests".

The best way to use these organisers at home, is to follow a simple mantra:



So simple but so effective.

- **1.** Look at a certain aspects of a particular knowledge organiser
- 2. Cover up part of their knowledge organiser
- 3. Write it out from memory
- 4. Check and correct any spelling mistakes, missing bits or mistakes



1: Joining Methods

Wood joints can be either permanent of temporary depending on the type and if glue is used.

Permanent:	Temporary:	
When we do not want When we will, or might		
to take the pieces apart	need to take pieces	
again apart again		
Glues, welding, rivets	Screws, bolts, nails	



most materials.

ended production

4: Materials 4.1 Woods: Hardwoods: Softwoods: Beech Scots Pine Oak Cedar Ash Spruce 4.2 Engineered Boards Engineered boards are manmade materials usually made by mixing wood chips and glues to make wooden sheets. Examples: Medium Density Fibreboard (MDF) Chipboard, Plywood and Hardboard 4.3 Plastics Plastics are made of polymers, and are mostly refined from oil. There are 2 main categories: Thermoplastics Thermosetting plastics Urea Formaldehyde Acrylic Polypropylene (PP) Melamine Formaldehyde **High Impact Epoxy Resin** Polystyrene (HIPS) 4.4 Metals Metals are hard and usually shiny, containing one or more elements dug and refined from the ground Ferrous metals are any Non-Ferrous metals do metal that contains not contain iron and will iron and will rust not rust Alloys are metals made from a mix of 2 metals brass is made of copper and zinc. *Composite* materials are a mix of 2 different types of material to get the best qualities from each - eg: GRP (Glass Reinforced Plastic)



6: Surfac<mark>e Finis</mark>hes

Finishing is usually one of the last stages of making a project. It will usually involve sanding and applying a surface coating to protect your material and improve its visual appearance.

Some examples: Paint, Stain, Varnish, Oil, Danish Oil, Wax, Polish & Dip Coating.

7: KEY WORD FOCUS

You should be able to explain the meaning of each of these words by the end of this rotation.

CAD	Computer Aided Design	
CAM	Computer Aided Manufacture	
CNC	Computer Numerical Control	

1. Paper	
Туре	Description and uses
Layout paper	 lightweight, thin white paper used for initial ideas takes colour media well low cost
Tracing paper	 thin, translucent paper making copies of drawings high cost
Cartridge paper	 good quality white paper available in different weights general purpose work can be used to make simple models medium cost
Bleedproof paper	 smooth, hard paper used with water-based and spirit-based felt-tip pens medium cost
Grid paper	 printed square and isometric grids in different sizes a guide for quick sketches and working drawings low cost

2. Selection of materials or components

When selecting materials and components considering the factors listed below:

- Functionality: application of use, ease of working
- Aesthetics: surface finish, texture and colour.
- Environmental factors: recyclable or reused materials, product mileage.
- Availability: ease of sourcing and purchase.
- Cost: bulk buying.
- Social factors: social responsibility.
- Cultural factors: sensitive to cultural influences.
- Ethical factors: purchased from ethical sources such as FSC.

What is the FSC? <u>http://www.fsc-uk.org/en-uk/about-</u> <u>fsc/what-is-fsc/fsc-principles</u>

3. Boards

Туре	Description and uses	
Corrugated card	 strong and lightweight used for packaging protection and point of sale stands available in different thicknesses 	
Duplex board	large foam-based board different finishes available including metallic and hologrammatic used for food packaging, e.g. take-away pizza boxes	
Foil lined board	 quality cardboard with a aluminium foil lining ideal for ready made meals or take away meal cartons The foil retains the heat and helps keep the food warm 	
Foam core board	 very light, very stiff and very flat. It has a white, rigid polystyrene foam centre, with smooth white paper laminated onto both faces. It is easy to cut with a knife, a mount cutter or on a wall cutter great for modelling 	
Ink jet card	 Has been treated so that it will give a high quality finish with inkjet ink available in matt and gloss 	
Solid white board	 top quality cardboard made from quality bleached wood pulp. used for hard backed books and more expensive items excellent print finish 	

5. Properties of paper and boards.

Туре	Weight or thickness	Uses	Relative cost (10= high)
Newsprint	50gsm	Newspapers	1
Layout Paper	60gsm	Sketches and tracing	3
Tracing Paper	70 gsm	Tracing	4
Sugar Paper	90gsm	Cheap mounting work	2
Inkjet/Photo paper	150- 230gsm	Photos/Pres entations	9
Board (Card)	230-750 microns	Model- making	5
Mount Board	230-1000 microns	Model- making, High picture quality mounting	9
Corrugated Card	3000-5000 microns	Packaging protection	5

4. Paper and Boards- 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,

eg 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.

A4

A5 A6



You should be able to explain the meaning of each of these words by the end of this rotation.

GSM	Grams per Square Metre	
Microns	Thickness of paper or card.	
	1000microns =1mm thickness	

1. Fabrics

Natural Fabrics

Cotton	Soft, good absorbency, prints well, machine washable, strong breathable	Origins from the Cotton Plant.	Uses: Jeans, towels, Shirts, dresses, underwear
Wool	High UV protection, flameproof, breathable, durable insulating	Origins from Sheep.	Uses: Jumpers, Coat, blankets
Silk	Smooth, Soft, Strong	Origins from the silk worm.	Uses: Wedding dresses, lingerie.
Linen	Strong, cool in hot weather	Origins from the flax plant	Uses: Trousers, tops.
Leather/Suede	Strong, hardwearing, durable.	Origins from the skin of animals, mainly cows.	Uses: Jackets, Trousers, Shoes.

Synthetic fabrics

Polyester	Durable, wrinkle resistant, stain resistant	Uses: Shirts, jackets. Also used in safety belts, conveyor belts and tyre reinforcement.
Polyamide (Nylon)	Durable, high abrasion resistance	Uses: Sportswear, carpets.
Elastane (Lycra)	Stretchy, durable, high stain resistance	Uses: Sportswear, Swimwear, tights.
Viscose	Soft, comfortable, absorbent, easily dyed.	Uses: Dresses, linings, shorts, shirts, coats, jackets and outerwear.
Acrylic	Absorbent, retains shape after washing, easily dyed, resistance to sunlight.	Uses: Jumpers, tracksuits, linings in boots.

1. Fabrics

Blended and mixed Fabrics

These fabrics take on the positive characteristics of their combinations

3. Care

Labels

			Washing
Cotton/Polyester	Easy care and crease resistant	Uses: School shirts.	Label- will
L		· · · · · · · · · · · · · · · · · · ·	usually
			have a
2. Fabric Constr	wation		max.
	Mayon		temp
	woven		number
Plain Weave	Extremely strong and hard wearing		included
			Hand
			Wash
	Extremely high		only
	strength and abrasion		
	resistant.		Do not
			wring
			out
	Knitted		Tumble
Knitted fabrics	Stretchy, soft and comfortable.	89.369090	Dry
			Iron on
			low
			heat.
	Non-Woven		The
Rondod Fabrics	These are webs of		more
BUILLEU FADILLS	fibres held together		dots the
	by glue or stitches.		higher
			the
Felted Fabrics	Felt is made by		neat
	moisture and hear to	and a subscription	setting
	interlock a mat of		
	wool fibres.		🖌 🖌 Do not
			bleach
			l ,



4. Key Terminology

Pattern

This is the term given to a paper template to aid in the cutting out of fabric for accurate



Seam Allowance

This is usually a 1cm 'boarder' around your pattern to allow for construction to be the correct size.



Right Side

Wrong Side

wish to see.

This is the side of the

fabric that you do not

This is the 'correct' side of the fabric that you wish to see.



Pressing

This is the term given when ironing your product; e.g. press your seams open, would refer to when an open seam is sewn and they need to pressed outwards to give a flat finish.

1. CAD – Computer Aided Design		
Advantages of CAD	Disadvantages of CAD	
Designs can be created,	CAD software is complex to	
saved and edited easily,	learn	
saving time		
Designs or parts of designs	Software can be very	
can be easily copied or	expensive	
repeated		
Designs can be worked on	Compatibility issues with	
by remote teams	software	
simultaneously		
Designs can be rendered to	Security issues - Risk of data	
look photo-realistic to	being corrupted or hacked	
gather public opinion in a		
range of finishes	<u> </u>	
CAD is very accurate	SolidWorks DESIGN	
CAD software can process		
complex stress testing	CAD Software	

2. CAM - Computer Aided Manufacturing

Advantages of CAM	Disadvantages of CAM
Quick – Speed of	Training is required to
production can be	operate CAM.
increased.	
Consistency – All parts	High initial outlay for
manufactures are all the	machines.
same.	
Accuracy – Accuracy can be	Production stoppage – If the
greatly improved using	machines break down, the
CAM.	production would stop.
Less Mistakes – There is no	Social issues . Areas can
human error unless pre	decline as human jobs are
programmed.	taken.
Cost Savings – Workforce	
can be reduced.	

Robots



Laser Cutter

AGV - Automated Barcode Scanner Guided Vehicle

3: Production Techniques

3.1 Flexible Manufacturing Systems (FMS) : involves an assembly of automated machines commonly used on short-run batch production lines where the products frequently change.

3.2 Lean Manufacturing: It aims to manufacture products just before they are required to eliminate areas of waste including:

- Overproduction
- Waiting
- Transportation
- Inappropriate processing
- **Excessive** inventory
- Unnecessary motion
- Defects

3.3 Just In Time (JIT) : Items are created as they are demanded. No surplus stock of raw material, component or finished parts are kept.

Advantages of JIT	Disadvantages of JIT
No warehousing costs	Reliant on a high quality supply chain
Ordered secured before outlay on parts is required	Stock is not available immediately off-the- shelf
Stock does not become obsolete, damaged or deteriorated	Fewer benefits from bulk purchasing

4. Scales of Production

One off: when you make a unique item Batch: when you make a few/set amount Mass: when you make thousands Continuous: open ended production

5: Informing Design Decisions

5.1 Planned obsolescence - Planned

obsolescence is when a product is deliberately designed to have a specific life span. This is usually a shortened life span.

5.2 Design for maintenance - Products are often designed to be thrown away when they fail... This can be achieved by designing products that can be repaired and maintained.

5.3 Disposability – Some products are designed to be disposable.

5.4 Product Lifecycle -





7: KEY WORD FOCUS

You should be able to explain the meaning of each of these words by the end of this rotation.

CNC	Computer Numerical Control
EPOS	Electronic Point Of Sale (Barcodes)





4: How to work out a levers distance of travel





3: Mechanical Devices - Linkages

Reverse motion linkage	The reverse motion linkage changes the direction of the input motion so that the output travels in the opposite direction. If the input is pulled the output pushes and vice versa. It uses a central bar held in position with a fixed pivot (fulcrum) that forces the change in direction and two moving pivots which are connected to the input and output bars.	Moving Pivot Fixed Pivot Woving Pivot
Parallel motion or push/ pull linkage	The push/pull linkage maintains the direction of the input motion so that the output travels in the same direction. If the input is pulled the output is pulled and so on. It uses three linking bars, four moving pivots and two fixed pivots.	Moving Pivot
Bell crank linkage	The bell crank linkage changes the direction of the input motion through 90 degrees. It can be used to change horizontal motion into vertical motion or vice versa. It uses a fixed pivot and two moving pivots.	Moving Pivot
Crank and slider	The crank and slider linkage changes rotary motion into reciprocating motion or vice versa. It uses a crank which is held with a fixed pivot. A connecting rod uses two moving pivots to push and pull a slider along a set path.	
Treadle linkage	The treadle linkage changes rotary motion into oscillating motion or vice versa. It uses a crank which is held with a fixed pivot. A connecting rod uses two moving pivots and a further fixed pivot to create a windscreen wiper motion.	

1: Forces and Stresses

Force	Description	A fair test for each	How a material /	Examples
		force/stress.	object can be	
			adapted to	
			resist	
Tension	Forces pulling in opposite directions.	Apply the same weight to each material and suspended in the same manner.	Concrete can have steel bars inserted to reinforce.	
Compression	Forces that are trying to crush or shorten.	Insert materials into a vice/clamp and apply the same amount of twists to the handle.	Composite panels can have a honeycomb structure sandwiched in the middle to resist.	
Bending	Flexing force	Apply the same weight to the material.	Steel beams have an l profile to resist bending.	
Torsion	Twisting force.	Use clamps & stands to hold the materials and turn in opposite directions at the same angle.	The diagonals on a tower crane help the structure against torsion.	
Shear	A strain produced when an object is	Place the material between a tool that	Bolts are hardened and have unthreaded	
	subjected to	works in opposite	shanks to help stop	C.
	opposing forces.	airections. e.g. Shears	snearing.	

2. Improving functionality of materials

Process	Description	Result	Example	Visual
				Example
Lamination	Layering of thin materials	Depending on the direction of lamination it can make boards stiffer or actually more flexible	Plywood: Laminations at 90 degrees to each other - Rigid Flexi-ply: laminations all the same direction - Bendy	
Bending / Folding	Folding a 90 degree edge on sheet metal / plastic	Makes the panel more rigid	Body panels on cars	-
Webbing	Modern polymer fabrics woven together	Extremely strong and durable fabric	Seat belts	
Fabric interfacing	A strengthening material added to the unseen face of a fabric	Adds strength / shape	Shirt collars	

1: The Modification of properties for specific purposes	Process	Material	Purpose	Timber being seasoned in a kiln
	Seasoning	Timber	Removes the moisture content so that the timber will not shrink, warp and twist	
	Annealing (heating)	Copper	Softens the copper to make it more malleable	Copper bowl being annealed
	Addition of Stabilisers	PVC	Stops plastic become brittle with exposure to the sun	Metal compounds (stabilisers) are added to PVC for UV protection



In a thermal power station fuel such as coal, oil or gas is burned in a furnace to produce heat - chemical to heat energy.

- this heat is used to change water into steam in the boiler.
- the steam drives the turbine heat to kinetic energy
- this drives the generator to produce electricity kinetic to electrical energy.

Some experts believe that fossil fuels will run out in our lifetime.

Energy Types 2. Biomass Energy –Renewable Energy



Biomass is an industry term for getting energy by burning wood, and other organic matter. Burning biomass releases carbon emissions, but has been classed as a renewable energy source in the EU and UN legal frameworks, because plant stocks can be replaced with new growth.

Energy Types

3. Nuclear Energy – Renewable

energy



The main nuclear fuels

are **uranium** and **plutonium**. In a nuclear power station nuclear fuel undergoes a controlled chain reaction in the reactor to produce heat - nuclear to heat energy.

- heat is used to change water into steam in the boiler.
- the steam drives the turbine (heat to kinetic energy)
- this drives the generator to produce electricity kinetic to electrical energy.

Energy Types 8.Batteries

every charge.

8.Batteries Alkaline batteries are the most common type of domestic

batteries, they are disposable but contain chemicals that are bad for the environment. Fortunately more and more battery recycling banks are appearing now where most of the battery can be reused. **Rechargeable batteries** are better for the environment and more economical in the long run (High initial purchase price). Their lifespan decreases with

6. Tidal Energy – Renewable Energy



7. Hydroelectricity – Renewable Energy



 In a hydroelectric power station water is stored behind a dam in a reservoir. This water has gravitational potential energy.

- The water runs down pipes (potential to kinetic energy) to turn the turbine
- The turbine is connected to a generator to produce electricity (kinetic to electrical energy).



4. Wind Energy – Renewable Energy

Redragende talender Redragende talender<

5. Solar Energy – Renewable Energy



The 6 R's

The 6 Rs are an important checklist. They are used by designers to reduce the environmental impact of products. They can also be used to evaluate the environmental impact of other products.

The **hierarchy of sustainability** places the strategies that are best for the planet about those that have a greater negative impact on the environment.



1. Refuse

The first stage in the process is to ask whether the proposed product, part, purchase or even journey is required at all. Asking the question 'Is it really necessary?' can play a major role in reducing the demand on materials. Simply not using something saves 100% of what you have chosen not to use. Example include:

- Using your own carrier bag rather than purchasing a new one.
- Walking or cycling to school instead of being driven.
- Not using products such as some pesticides that are known to be harmful to the environment.
- Not eating (or using) products that are overfarmed, over-fished or on the endangered list.

7. Sustainability

Our planet has to provide all of our basic human needs, such as food, shelter and warmth.

Designers now have a much better understanding of which materials are sustainable and which are not. The general principle is that resources fall into two categories: **Finite resources** – are ones which are in limited supply or cannot be reproduced.

Non-finite resources – are ones which are in abundant supply and are unlikely to be exhausted.

2. Rethink

Consumers have a growing number of choices to make about where and on what they spend their income. Greener and more sustainable options are not always the cheapest or the best, but making informed decision and rethinking ones spending power can play a huge part in conserving resources.

Deciding on the design of a product, e.g. the materials being used in its production, will directly affect its sustainability. The types of questions designers need to ask are:

- Are the materials locally sourced?
- Are they sustainably produced?
- Is it essential to use this material, of which there is a finite supply?

By rethinking how the product is likely to be made, the product can often be redesigned in a more responsible way.

3. Reduce

Reduction is often the result of having re-thought a design or action. Materials and energy are saved due to efficient manufacturing practices and the use of clever design, incorporating sustainable materials.

- Modern materials that are lighter and stronger than traditional ones have contributed to the miniaturisation of products, saving material and energy in manufacture and use.
- Reducing the complexity or number of parts a product uses and reducing the number of different materials in a product makes recycling easier.
- In factories, schools and hotels, fitting motion sensitive lighting and smart heating systems can significantly reduce energy usage.
- Many large companies employ staff to conduct 'energy walks' to turn off unused appliances and lights and to ensure windows and doors are shut to conserve heat.

8. Recyclable materials

Once all useful and recyclable materials are removed, the majority of the remaining waste is organic matter and can be processed in one of two ways; **'Recover'** or **'Rot'**. Food waste and garden waste can be processed at a high temperature and turned into compost. The waste can also be buried in **landfill** sites where the resulting methane gas from the rotting matter is collected and burned and used to generate heat or electricity in the same way.

4. Reuse

Reusing products multiple times for the same purpose is also known as **primary recycling.** Reusing a product in a different way from the one it was designed for is known as **secondary recycling.** The classic glass milk bottle is reused many times before it reaches the end of its useful life, as which point it is recycled. A plastic milk bottle, however, is intended to be used only one, although it can have many different subsequent uses.

Donating to and buying from charity shops extends the life of products and in recent years there has been a resurgence of in products having second lives, thanks to websites such as eBay, Freecycle or Gum tree.

freecycle

ebay



It is also becoming popular for furniture and other household items to be **upcycled** with a coat of paint and some minor repairs or adaptations, extending their useful life by many years.

5. Repair

Being able to repair a product when it is broken or worn is a way of extending its life and delaying the purchase of a new one. Repairing is a positive option over replacement as it means that only some parts of the product are replaced. This creates jobs for skilled people who conduct repairs and stimulates a spare parts market. Unfortunately, repairing products has become harder over years. Growing number of products are not design to be repaired. There are a number of reasons why items may be designed this way, but it is usually because they are cheaper to replace than repair. Some products, especially modern electronic products, are designed to last only a few years as technology dates quickly and older products will be superseded by newer, faster, more efficient models. This is called **planned obsolescence.**

6. Recycle

Tertiary recycling, although a very important stage, is lower down the hierarchy of preferred options because most materials that are recycled this way tend to be of lower quality than the original material. It takes a lot of energy to recycle materials.

This form of recycling requires the reprocessing of the material and in many cases involves chemicals and/or heat to recover the recycled materials. In an ideal world, tertiary recycling would remove all recyclable materials from our household waste so that only biodegradable materials would be left. Only very few parts of the world are set up to cope with this level of processing.

Knowledge Organiser AQA Design & Technology 8552				Designer Name	Facts	Logo	Examples
Designer Name	Facts	Logo	Examples	Marcel	Marcel Lajos Breuer (22 May 1902 – 1 July 1981) was a Hungarian-born	and	
Coco Chanel	Gabrielle Bonheur "Coco" Chanel (19 August 1883 – 10 January 1971) was a French fashion designer and businesswoman. She was the	CHANEL		bicuci	modernist, architect, and furniture designer. Breuer extended the sculptural vocabulary he had developed in the carpentry shop at the Bauhaus into a personal architecture	A A A A A A A A A A A A A A A A A A A	
	founder and namesake of the Chanel brand.			Sir Alec	Sir Alexander Arnold Constantine Issigonis; 18 November 1906 – 2		
Alexander McQueen	Lee Alexander McQueen, CBE (17 March 1969 – 11 February 2010), known professionally as Alexander McQueen, was a British fashion designer and couturier. He is known for			1331501113	October 1988) was a British-Greek designer of cars, widely noted for the ground-breaking and influential development of the Mini, launched by the British Motor Corporation (BMC) in 1959.		
	having worked as chief designer at Givenchy from 1996 to 2001 and for founding his own Alexander McQueen label.			William Morris	William Morris (24 March 1834 – 3 October 1896) was an English textile designer, poet, novelist, translator, and socialist activist. Associated with the	MORIE	
Vivienne Westwood	Vivienne Vestwood April 1941) is a British fashion designer and businesswoman,	Vitionna	terne twood		British Arts and Crafts Movement, he was a major contributor to the revival of traditional British textile arts and methods of production.	280°	
largely responsible for bringing modern punk and new wave fashions into the mainstream.	largely responsible for bringing modern punk and new wave fashions into the mainstream.	Westwood		Mary Quant	Dame Barbara Mary Quant, Mrs Plunket Greene, (born 11 February 1934) is a Welsh fashion designer and		
Harry Beck	Henry Charles Beck (4 June 1902 – 18 September 1974), known as Harry Beck, was an English technical draughtsman	<pre>< (4 June ier 1974), ck, was an raughtsman</pre>			British fashion icon She became an instrumental figure in the 1960s London-based Mod and youth fashion movements.	MARY QUANT	
	best known for creating the present London Underground Tube map in 1931.	was born here		Louis Comfort	Louis Comfort Tiffany (February 18, 1848 – January 17, 1933) was an American artist and designer who		
Norman	Norman Robert Foster, Baron Foster of Thames Bank. OM.	004400		Tiffany	worked in the decorative arts. He is best known for his work in stained glass.		
ruster	HonFREng (born 1 June 1935) is a British architect whose company, Foster + Partners, maintains an international design practice famous for high- tech architecture.	NORMAN FOSTER		Philippe Starck	Philippe Starck (born January 18, 1949) is a French designer known since the start of his career in the 1980s for his interior, product, industrial and architectural design including furniture	SXARCK	

Knowledge Organiser AQA Design & Technology 8552			Company Facts Name	Facts	Logo	Examples	
Designer Name	Facts	Logo	Examples	Alessi	Alessi is a housewares and kitchen utensil company in Italy, producing everyday items from plastic and	ALESSI	🦛 🖗
Raymond Templier	RAYMOND TEMPLIER (1891 - 1968) like many of his contemporaries in jewelry, was born to a family with a long tradition as jewelers.	PARS DUD		Apple	metal, created by famous designers. Apple Inc. is an American multinational technology company headquartered in Cupertino, California that designs, develops, and		
Gerrit Rietveld	Gerrit Thomas Rietveld ; 24 June 1888 – 25 June 1964) was a Dutch furniture designer and architect	Gennit Hielveld			sells consumer electronics, computer software, and online services.		
	One of the principal members of the Dutch artistic movement called De Stijl, Rietveld is famous for his Red and Blue Chair.			Braun	Braun GmbH formerly Braun AG , is a German consumer products company based in Kronberg. From 1984 until 2007, Braun was a wholly owned subsidiary of The Gillette Company, which had purchased a controlling interest in the company in 1967.	BRAUN	
Charles C Rennie	Charles Rennie Mackintosh (7 June 1868 – 10 December 1928)	33.					
Macintosh	water colourist and artist. His artistic approach had much in common with European Symbolism. His work was influential on European design movements such as Art Nouveau	ACAIN TIOS H		Dyson	Dyson Ltd. is a British technology company established by James Dyson in 1987. It designs and manufactures household appliances such as vacuum cleaners, hand dryers, bladeless fans, heaters and hair dryers.	dyson	
Aldo Rossi	Aldo Rossi (3 May 1931 – 4 September 1997) was an Italian architect and designer who			GAP	The Gap, Inc. commonly known as Gap Inc. or Gap, (stylized as GAP) is an American worldwide clothing and accessories retailer.	GAP	GAP CONTRACTOR
	achieved international recognition in four distinct areas: theory, drawing, architecture and product design. He was the first Italian to receive the Pritzker Prize for architecture.	ALDO ROSSI		Primark	Primark known as Penneys in the Republic of Ireland) is an Irish clothing and accessories company which is a subsidiary of AB Foods, and is headquartered in Dublin.	PRIMARK*	
Ettore Sottsass	Ettore Sottsass (14 September 1917 – 31 December 2007) was an Italian architect and designer during the 20th contum. His work			Under Armour	Under Armour, Inc. is an American company that manufactures footwear, sports and casual apparel.		A A A A
	included furniture, jewellery, glass, lighting, home objects and office machine design, as well as many buildings and interiors.	SA SS		Zara	Zara is a Spanish clothing and accessories retailer based in Arteixo, Galicia. It is the main brand of the Inditex group, the world's largest apparel retailer.	ZARA	RAN PIPE