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3.1.1 New and emerging Technologies

Industry: The impact of new and emerging technologies on the design and organisation of the workplace.			
Industry: Automation and the use of robotics			
Industry: Buildings and the place of work			
Industry: Tools and equipment			
Enterprise: Virtual Marketing and retail			
Enterprise: Co-operatives			
Enterprise: Fairtrade			
Enterprise: Crowdfunding			
Sustainability: Finite and non-finite resources.			
Sustainability: disposal of waste			
Sustainability: The ecological and social footprint of materials.			
Sustainability: The impact of resource consumption on the planet			
People: Technology push and market pull.			
People: Changing job roles due to the emergence of new ways of working driven by technological change.			
Culture: Changes in fashion and trends in relation to new and emergent technologies.			
Culture: Respecting people of different faiths and beliefs.			
Society: How products are designed and made to avoid having a negative impact on others			
Society: Design for disabled			
Society: The elderly			
Society: Different religious groups			
Environment: Positive and negative impacts new products have on the environment			
Environment: Continuous improvement			
Environment: Efficient working			
Environment: Pollution			
Environment: Global warming			
Product Techniques and systems: The contemporary and potential use of automation			
Product Techniques and systems: The contemporary and potential use of Computer aided design (CAD)			
Product Techniques and systems: The contemporary and potential use of Computer aided manufacture (CAM)			
Product Techniques and systems: The contemporary and potential use of Flexible manufacturing systems (FMS)			
Product Techniques and systems: The contemporary and potential use of Just in Time (JIT)			
Product Techniques and systems: The contemporary and potential use of Lean manufacturing			
Critical evaluation: Planned obsolescence			
Critical evaluation: Design for maintenance			
Critical evaluation: Ethics			
Critical evaluation: The environment			
Critical evaluation: Product life cycles			

3.1.2 Energy generation and storage	Fossil fuels: how power is generated from coal			
	Fossil fuels: how power is generated from Gas			
	Fossil fuels: how power is generated from Oil			
	Fossil fuels: Arguments for and against the selection of fossil fuels			
	Fossil fuels: how energy is stored			
	Fossil fuels: how this is used as the basis for the selection of products and power systems.			
	Nuclear power: How nuclear power is generated			
	Nuclear power: Arguments for and against the selection of nuclear power			
	Renewable energy: How power is generated from Wind			
	Renewable energy: How power is generated from solar			
	Renewable energy: How power is generated from Tidal			
	Renewable energy: How power is generated from Hydro-electrical			
	Renewable energy: How power is generated from Biomass			
	Energy storage: Kinetic pumped storage systems			
	Energy storage: Alkaline and re-chargeable batteries.			

3.1.3 Developments in new materials	Modern materials: Developments made through the invention of new or improved processes eg Graphene, Metal foams and Titanium.			
	Modern materials: Alterations to perform a particular function eg Coated metals, Liquid Crystal Displays (LCDs) and Nanomaterials			
	Modern materials: Classification of the types of properties of a range of materials.			
	Modern materials: Extracting information from technical specifications.			
	Smart materials: That materials can have one or more properties that can be significantly changed in a controlled fashion by external stimuli, such as stress, temperature, moisture, or PH.			
	Smart materials: shape memory alloys			
	Smart materials: thermochromic pigments			
	Smart materials: photochromic pigments			
	Technical textiles: How fibres can be spun to make enhanced fabrics			
	Technical textiles: Conductive fabrics			
	Technical textiles: Fire resistant fabrics			
	Technical textiles: Kevlar			
	Technical textiles: Microfibres incorporating micro encapsulation.			

3.1.4 systems approach to designing	Inputs: The use of light sensors			
	Inputs: The use of temperature sensors			
	Inputs: The use of Pressure sensors			
	Inputs: The use of switches			
	Processes: The use of programming microcontrollers as counters			
	Processes: The use of programming microcontrollers as timers			
	Processes: The use of programming microcontrollers for decision making			
	Processes: The use of programming to provide functionality to products and processes.			
	Outputs: The use of buzzers to provide functionality to products and processes.			
	Outputs: The use of Speakers to provide functionality to products and processes.			
	Outputs: The use of lamps to provide functionality to products and processes.			

3.1.5 Mechanical Devices	The functions of mechanical devices to produce linear, rotary, reciprocating and oscillating movements.			
	Visualise and represent 2D and 3D objects including 2D diagrams of mechanisms/mechanical movement.			
	Lever: first order			
	Lever: second order			
	Lever: third order			
	Linkages: Bell cranks			
	Linkages: Push/pull			
	Rotary systems: CAMs and followers			
	Rotary systems: Simple gear trains			
	Rotary systems: Pulleys and belts			
	The action of forces and how levers and gears transmit and transform the effects of forces.			
	Arithmetic and numerical computation eg use ratios.			
	Use angular measures in degrees, visualise and represent 2D and 3D objects including 2D diagrams of mechanisms/ mechanical movement.			
	Knowledge of the function of mechanical devices to produce different sorts of movement, changing the magnitude and direction of forces.			

3.1.6 Materials and their working properties (paper and boards)	bleed proof			
	cartridge paper			
	grid			
	layout paper			
	tracing paper			
	corrugated card			
	duplex board			
	foil lined board			
	foam core board			
	ink jet card			
	solid white board			

3.1.6 Materials and their working properties (Natural and Manufactured Timbers)	Hardwood: Ash			
	Hardwood: Beech			
	Hardwood: Mahogany			
	Hardwood: Oak			
	Hardwood: Balsa			
	Softwood: Larch			
	Softwood: Pine			
	Softwood : Spruce			
	Manufactured boards: Medium Density Fibre Board (MDF)			
	Manufactured boards: Plywood			
	Manufactured boards : Chipboard			

3.1.6 Materials and their working properties (Metals and alloys)	Ferrous: Low carbon steel			
	Ferrous: Cast Iron			
	Ferrous: High carbon/tool steel			
	Non-ferrous: Aluminium			
	Non-ferrous: Copper			
	Non-Ferrous: Tin			
	Non-Ferrous: Zinc			
	Alloys: Brass			
	Manufactured boards: Medium Density Fibre Board (MDF)			
	Manufactured boards: Plywood			
	Manufactured boards : Chipboard			