Denton Community College 2019/20

Departmental Curriculum Map Template

Subject: Product Design Technology Multi Materials Year Group: 10

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topics	**MULTI MATERIALS** CORE CONTENT	**MULTI MATERIALS** CORE CONTENT	**MULTI MATERIALS** CORE CONTENT	**MULTI MATERIALS** CORE CONTENT	**MULTI MATERIALS** TIMBERS	**MULTI MATERIALS** TIMBERS
What will students during this unit?	Industry Unemployment, Workforce skill set, Demographic movement, Science & Technology Park Enterprise Privately owned business, crowd funding, government funding ,not for profit org. Sustainability Transportation costs, pollution, demand on natural resources, waste generated Metals: Dog tag project People Workforce, consumers, children, disabled, wage levels, highly skilled workforce, apprenticeships Culture Population movement within EU, social segregation/clustering of ethnic minorities Society	Investigate past and present designers research: - TESLA - Apple - Heatherwick studio - Alessi - Pixar - Raymond Loewy - Joe Casley Hayford - Zaha Hadid Form Function, client/user, performance, materials/components /systems, scale of production, cost, sustainability, marketability, consideration of innovation Evaluate new technologies that inform design decisions Budget and time, natural disasters, ethics and fair trade,	How energy is generated Fossil fuels, biofuels, tidal, wind, solar, hydroelectric. Batteries, solar, mains, wind power Composites Concrete, plywood, fibre/carbon/glass, reinforced polymers, robotic materials Technical Textiles Agro, construction, geo, domestic, environmentally friendly, protective, sports Mechanical devices Levers,(VR, MA & Efficiency) linkages, cams & followers, pulleys & belts (VR/input & output speeds) Gears (VR & RPM) Cranks & sliders, Rack & Pinion	Categorisation, structure and properties of materials Advantages and disadvantages when comparing materials and components. Justify choice of materials, components & manufacturing process Ferrous / non – ferrous – malleability, ductility, hardness. Paper/Board – flexibility, printability, biodegradability Thermoforming & Thermosets – insulator of heat, electricity & toughness Textiles Natural, synthetic, woven, non-woven, synthetic – elasticity, resilience, durability Timber - Hardwoods, softwoods, manufactured timbers	Analysing products past & present against Specification. Form, Function, client/user, performance, materials/components /systems, scale of production, cost, sustainability, marketability, consideration of innovation Design Strategies Drawing techniques Collaboration (team) User Centred design (survey, interview, focus group) systems thinking (Input, process, output) All the techniques for the NEA & why they would be chosen – eg isometric, orthographic, CAD MINI CAD project	**NEA FOCUS** Research and investigation focus Existing products Client Questionnaire Mood board Materials Research Specific Research Industrial manufacturing Methods Timbers Testing: Hard woods Soft woods Manufacturing methods

	Changes in working hours & shift patterns, Internet of things (IOT), remote working, video conference Environment Pollution, waste disposal, material separation, transportation of goods globally, packaging Production techniques and systems Standardised design and components, JIT, Lean manufacturing, batch, continuous, one off, mass.	carbon foot print and LCA Modern & SMART materials - SMA, nano, reactive glass, piezoelectric, temp. responsive polymers, conductive inks FESTIVE PRODUCT Brief and Marketing task. Link with Community lead. Practical skills Design skills	Electronic Systems How they add functionality to a product. How they respond to inputs and produce outputs Sensors LDR, thermistor. Control devices switches, transistors, resistors Outputs Buzzers, LED's Programmable Components How to make products do things! FLOWCHARTs Flowcharts, Switch inputs on/off, process and respond to analogue inputs, simple delays with outputs, loops and counts,	– hardness, toughness, durability. Environmental, social & economic challenges that might influence products Respect different social, ethnic & economic groups Appreciate environmental, social & economic issues 'Green' designs Recycling & Reusing (how) Human Capability Cost of materials Manufacturing capability LCA	2D Design Product **LAUNCH NEA 50%** Investigation of 3 themes Researching selected theme Client / user focus	

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	goods globally, packaging <u>Production techniques and systems</u> Standardised design and components, JIT, Lean manufacturing, batch, continuous, one off, mass.		<u>Programmable Components How to make products do things! FLOWCHARTs</u> Flowcharts, Switch inputs on/off, process and respond to analogue inputs, simple delays with outputs, loops and counts,			
When will students be assessed?	2-3 weeks testing Verbal feedback during practical lessons	2-3 weeks testing Verbal feedback during practical lessons	2-3 weeks testing Verbal feedback during practical lessons	2-3 weeks testing Verbal feedback during practical lessons	2-3 weeks testing Verbal feedback during practical lessons	2-3 weeks testing Verbal feedback during practical lessons

How will students be assessed?	Testing Book:	Testing Book:	Testing Book:	Testing Book:	Testing Book:	Testing Book:
Key Vocabulary	As underlined above	As underlined above	As underlined above	As underlined above	As underlined above	As underlined above
Homework opportunities to broaden or deepen student knowledge	Revision for testing using GCSE Pod bbc.bitesize technologystudent.com	Revision for testing using GCSE Pod bbc.bitesize technologystudent.com	Revision for testing using GCSE Pod bbc.bitesize technologystudent.com	Revision for testing using GCSE Pod bbc.bitesize technologystudent.com	Revision for testing using GCSE Pod bbc.bitesize technologystudent.com	Revision for testing using GCSE Pod bbc.bitesize technologystudent.com
Links to the National Curriculum	Full relation to Core content Edexcel Specification in line with NC	Full relation to Core content Edexcel Specification in line with NC	Full relation to Core content Edexcel Specification in line with NC	Full relation to Core content Edexcel Specification in line with NC	Full relation to Core content Edexcel Specification in line with NC	Full relation to Core content Edexcel Specification in line with NC