



Denton Community College

Departmental Curriculum Plan

Subject: Product Design Technology

Year Group: 10



	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topics	CORE CONTENT	CORE CONTENT	CORE CONTENT	CORE CONTENT	SPECIALISM: TIMBERS / Paper and BOARD	SPECIALISM: TIMBERS / Paper and BOARD
What will students during this unit?	<p><u>Industry</u> Unemployment, Workforce skill set, Demographic movement, Science & Technology Park</p> <p><u>Enterprise</u> Privately owned business, crowd funding, government funding ,not for profit org.</p> <p><u>Sustainability</u> Transportation costs, pollution, demand on natural resources, waste generated</p> <p><u>Metals: Dog tag project</u></p> <p><u>People</u> Workforce, consumers, children, disabled, wage levels, highly skilled workforce, apprenticeships</p> <p><u>Culture</u> Population movement within EU, social segregation/clustering of ethnic minorities</p> <p><u>Society</u> Changes in working hours & shift patterns, Internet of things (IOT), remote working, video conference</p> <p><u>Environment</u> Pollution, waste disposal, material separation, transportation of goods globally, packaging</p> <p><u>Production techniques and systems</u> Standardised design and components, JIT, Lean</p>	<p>Investigate past and present designers research: - TESLA - Apple - Heatherwick studio - Alessi - Pixar - Raymond Loewy - Joe Casley Hayford - Zaha Hadid</p> <p>Form Function, client/user, performance, materials/components/systems, scale of production, cost, sustainability, marketability, consideration of innovation</p> <p>Evaluate new technologies that inform design decisions</p> <p>Budget and time, natural disasters, ethics and fair trade, carbon foot print and LCA</p> <p>Modern & SMART materials - SMA, nano, reactive glass, piezoelectric, temp. responsive polymers, conductive inks</p> <p><u>FESTIVE PRODUCT</u> Brief and Marketing task.</p>	<p><u>How energy is generated</u> Fossil fuels, biofuels, tidal, wind, solar, hydroelectric. Batteries, solar, mains, wind power</p> <p><u>Composites</u> Concrete, plywood, fibre/carbon/glass, reinforced polymers, robotic materials</p> <p><u>Technical Textiles</u> Agro, construction, geo, domestic, environmentally friendly, protective, sports</p> <p><u>Mechanical devices</u> Levers,(VR, MA & Efficiency) linkages, cams & followers, pulleys & belts (VR/input & output speeds) Gears (VR & RPM) Cranks & sliders, Rack & Pinion</p> <p><u>Electronic Systems</u> How they add functionality to a product. How they respond to inputs and produce outputs <u>Sensors</u> LDR, thermistor. <u>Control devices</u> switches, transistors, resistors <u>Outputs</u> Buzzers, LED's</p>	<p><u>Categorisation, structure and properties of materials</u></p> <p>Advantages and disadvantages when comparing materials and components.</p> <p>Justify choice of materials, components & manufacturing process</p> <p><u>Ferrous / non – ferrous –</u> malleability, ductility, hardness. <u>Paper/Board –</u> flexibility, printability, biodegradability <u>Thermoforming & Thermosets –</u> insulator of heat, electricity & toughness <u>Textiles</u> Natural, synthetic, woven, non-woven, synthetic – elasticity, resilience, durability <u>Timber -</u> Hardwoods, softwoods, manufactured timbers – hardness, toughness, durability.</p> <p>Environmental, social & economic challenges that might influence products <u>Respect</u> different social, ethnic & economic groups <u>Appreciate</u> environmental, social & economic issues <u>'Green'</u> designs</p>	<p><u>Analysing products past & present against Specification.</u> Form, Function, client/user, performance, materials/components/systems, scale of production, cost, sustainability, marketability, consideration of innovation</p> <p><u>Design Strategies</u></p> <p><u>Drawing techniques</u></p> <p>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</p> <p><u>MINI CAD project</u> 2D Design Product</p> <p>LAUNCH NEA 50% Investigation of 3 themes Researching selected theme Client / user focus</p>	<p>NEA FOCUS <u>Research and investigation focus</u></p> <p>Existing products</p> <p>Client Questionnaire</p> <p>Mood board</p> <p>Materials Research</p> <p>Specific Research</p> <p>Industrial manufacturing Methods</p> <p><u>Timbers Testing:</u></p> <p><u>Hard woods</u></p> <p><u>Soft woods</u></p> <p><u>Manufacturing methods</u></p>

	<p>manufacturing, batch, continuous, one off, mass.</p>	<p>Link with Community lead.</p> <p>Practical skills</p> <p>Design skills</p>	<p><u>Programmable Components</u> <u>How to make products do things!</u> FLOWCHARTs</p> <p>Flowcharts, Switch inputs on/off, process and respond to analogue inputs, simple delays with outputs, loops and counts,</p>	<p><u>Recycling & Reusing (how)</u> <u>Human Capability</u> <u>Cost of materials</u> <u>Manufacturing capability</u> <u>LCA</u></p>		
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<p>When will students be assessed?</p>	<p>2-3 weeks testing Verbal feedback during practical lessons</p>	<p>2-3 weeks testing Verbal feedback during practical lessons</p>	<p>2-3 weeks testing Verbal feedback during practical lessons</p>	<p>2-3 weeks testing Verbal feedback during practical lessons</p>	<p>2-3 weeks testing Verbal feedback during practical lessons</p>	<p>2-3 weeks testing Verbal feedback during practical lessons</p>

