
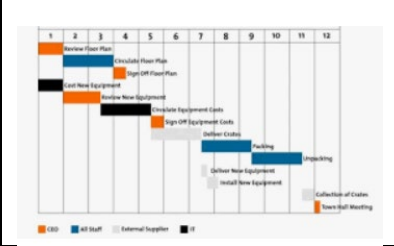
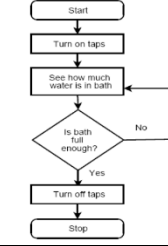
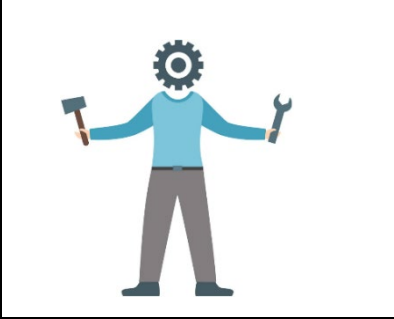



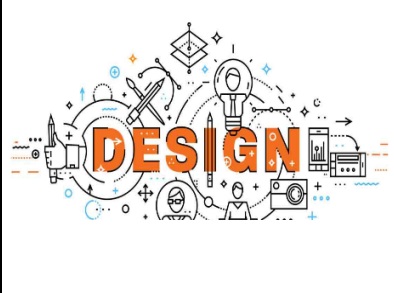


Year 11 Knowledge Organiser – Engineering Design - Creating a prototype

To understand the benefits of making a prototype.
Understand how the analysis of a prototype is an essential part of improving a design or process

Subject Area	Required Knowledge		Links																
	<p>Materials knowledge:</p> <ul style="list-style-type: none"> • Compile a selection of suitable materials. • Describe the properties of the material • Select the most suitable material. 	<ul style="list-style-type: none"> • Hardness • Toughness • Malleability • Strength • Ductility • Density <p>Material properties have specific names. These can be used to compare or select materials for an application</p> <ul style="list-style-type: none"> • Corrosion resistance • Elasticity • Thermal Conductivity • Electrical Conductivity • Absorbency 	<p>BBC Bitesize Click here</p>																
	<p>Planning and preparing:</p> <ul style="list-style-type: none"> • Analyse a Specification • GANNT chart to communicate the time frame of the project • Create a flowchart to determine the order and process involved • Risk assessments of machines and equipment to be used. 	 <pre> graph TD Start([Start]) --> TurnOn[Turn on taps] TurnOn --> CheckWater{See how much water is in bath} CheckWater -- No --> TurnOn CheckWater -- Yes --> TurnOff[Turn off taps] TurnOff --> Stop([Stop]) </pre>	<p>Specification Click here Gannt chart Click here Flowchart Click here</p>																
	<p>Practical skills:</p> <ul style="list-style-type: none"> • Following a process • Safely using equipment • Using Hand tools and machines to produce a product • Recording and writing a ‘make diary’ 	<p>Lesson 1 Equipment: [metal vice], [second-cut file], [rule], [engineering blue ink], [odd legged callipers].</p>  <p>I collected three pieces of bright drawn metal steel measuring 150mm each. 5 mins</p> <p>These metal pieces had burrs on the end from being cut. I clamped each piece individually into the metal vice and use a second-cut file to remove the burr so the edges were smooth and safe. 10 mins</p> <p>I then cleaned the metal of all the oils with a paper towel so I could then paint over each one with engineering blue.</p> 																	
	<p>Analysis and Evaluation of the design process:</p> <ul style="list-style-type: none"> • Evaluate own performance against plan • Evaluate the design against the specification • Identify possible improvements to own performance • Identify possible improvements to design/product • Effective communication of analysis and improvements 	<table border="0"> <tr> <td>A is for Aesthetics</td> <td> Aesthetics means what does the product look like? What is the Colour? Shape? Texture? Material? Appearance? Size? Weight? Style?</td> </tr> <tr> <td>C is for Cost</td> <td> Cost means how much does the product cost to buy? How much does it Cost to buy? Cost to make? How much do the different materials cost? Is it good value?</td> </tr> <tr> <td>C is for Customer</td> <td> Customer means who will buy or use your product? Who will buy your product? Who will use your product? What are their Needs? Expectations? Preferences? What are their Likes? Dislikes? Needs? Preferences?</td> </tr> <tr> <td>E is for Environment</td> <td> Environment means will the product affect the environment? Is the product Recyclable? Reusable? Repairable? Sustainable? Environmentally friendly? Bad for the environment? 4R's of Design: Reduce / Reuse / Repair / Refuse / Reuse / Refuse</td> </tr> <tr> <td>S is for Size</td> <td> Size means how big or small is the product? What is the size of the product in millimeters? Is it the same size as similar products? Is it comfortable to use? Does it fit? Would it be improved if was larger or smaller?</td> </tr> <tr> <td>S is for Safety</td> <td> Safety means how safe is the product when it is used? Will it be safe for the customer to use? Could they get damaged? What is the correct and safest way to use the product? What are the risks?</td> </tr> <tr> <td>F is for Function</td> <td> Function means how does the product work? What is the products job and role? What is it needed for? How well does it work? How could it be improved? What is it used for and why?</td> </tr> <tr> <td>M is for Material</td> <td> Material means what is the product made out of? What materials is the product made from? Why were these materials used? Would a different material be better? How was the product made? What manufacturing techniques were used?</td> </tr> </table>	A is for Aesthetics	Aesthetics means what does the product look like? What is the Colour? Shape? Texture? Material? Appearance? Size? Weight? Style?	C is for Cost	Cost means how much does the product cost to buy? How much does it Cost to buy? Cost to make? How much do the different materials cost? Is it good value?	C is for Customer	Customer means who will buy or use your product? Who will buy your product? Who will use your product? What are their Needs? Expectations? Preferences? What are their Likes? Dislikes? Needs? Preferences?	E is for Environment	Environment means will the product affect the environment? Is the product Recyclable? Reusable? Repairable? Sustainable? Environmentally friendly? Bad for the environment? 4R's of Design: Reduce / Reuse / Repair / Refuse / Reuse / Refuse	S is for Size	Size means how big or small is the product? What is the size of the product in millimeters? Is it the same size as similar products? Is it comfortable to use? Does it fit? Would it be improved if was larger or smaller?	S is for Safety	Safety means how safe is the product when it is used? Will it be safe for the customer to use? Could they get damaged? What is the correct and safest way to use the product? What are the risks?	F is for Function	Function means how does the product work? What is the products job and role? What is it needed for? How well does it work? How could it be improved? What is it used for and why?	M is for Material	Material means what is the product made out of? What materials is the product made from? Why were these materials used? Would a different material be better? How was the product made? What manufacturing techniques were used?	<p>Evaluation Click here</p>
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