
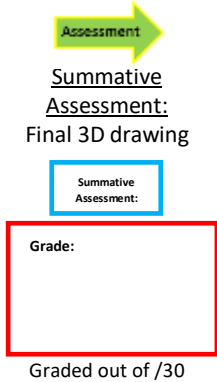
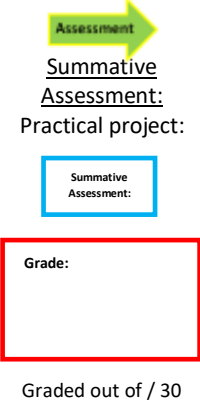


<p><b>This half term: Skills, Knowledge and Understanding to be developed:</b></p> <p><u>Students will design engineering outcomes in response to needs, wants or difficulties. Learners become enterprising problem-solvers who are well placed to contribute to society.</u></p> <ul style="list-style-type: none"> <li><b>SKILLS:</b> Each individual will be able to select and <u>safely</u> use appropriate <u>tools, materials and equipment</u> to methodically construct purposeful outcomes.</li> <li><b>KNOWLEDGE:</b> Students will apply their knowledge of the working properties of <u>materials</u> and associated <u>techniques</u> to support <u>prototyping</u> and <u>making</u>.</li> <li><b>UNDERSTANDING:</b> Students will show their understanding by <u>developing</u> and <u>improving design proposals</u>, through <u>questioning</u> and <u>evaluating</u> with peers.</li> </ul>		<p><b>Key Terms / Words:</b></p> <p>Brief, Circuit, Light Emitting Diode, Environment, Sustainability, Corporate identity, Design, Developing Ideas, Circuit Diagram, Product, Soldering, Resistor, Soldering Iron, Etching, Laser Cutter, Polarity, Bitmap and Vector images.</p>	
<p><b>Week 1 Learning Outcomes:</b></p> <p><b>1. Introduction to the course</b>  <i>Students will have opportunities for innovative designing that are beyond the constraints of their practical skills.</i>  <b>Students will be able to</b> understand the project Brief, course expectations and go through the Learning Programme.</p> <p><b>2. Students will be able to</b> know what the purpose of a Design Brief is and how to write it. They will be given the opportunity to discuss ideas (Class discussion) and write the design brief down in their own words. They will understand how to produce a spider diagram on possible themes, Clients, clients' needs and a location the product might be placed.</p>		<p><b>Success Criteria:</b></p> <ol style="list-style-type: none"> <li>Students will understand the task in hand.</li> <li>Students will be able to identify the possibilities for designing.</li> <li>Pupils will know how to generate their own Brief in detail</li> </ol>	<p><b>Homework W1</b></p> <p>Homework:</p>
<p><b>Week 2 Learning Outcomes:</b></p> <p><b>3. Design Specification</b>  <i>Students will consider the needs and wants of the end user and take into account of environmental and societal impacts.</i>  <b>Students will be able to</b> understand how to develop a detailed Specification in their workbooks commenting on Aesthetics, Safety, Cost, Size, Customer, Function, Environment, Materials and Manufacture. The students will discuss each point, draft their responses then re-write it in their workbooks. They will need to develop a detailed specification outlining their intentions using the correct terminology and number each statement in the order of importance.</p> <ul style="list-style-type: none"> <li>Students will write legibly and fluently a suitable design specification by using correct and relevant technical terms, language and expression. (7.WL2)</li> <li>Students will be able to discuss which specification points are the most important and why.</li> </ul>	<p style="text-align: center;">  <b>APP task: LP</b>          Design Specification.  <div style="border: 1px solid blue; padding: 2px; display: inline-block; margin: 5px;">APP</div>  <div style="border: 1px solid red; padding: 5px; width: 100px; height: 40px; display: inline-block; margin: 5px;">Grade:</div>          Graded out of /15</p>	<p><b>Success Criteria:</b></p> <ol style="list-style-type: none"> <li>Students will know and understand the importance and the need of a Design Specification</li> <li>Students will know how important it is to understand the client's needs</li> <li>Students will be able to reason why points are listed in hierarchy order.</li> <li>Students will be showing an understanding of who their client is, along with relevant technical details along with use of suitable vocabulary.</li> <li>Students will be able to reason what is the hierarchy of specification points. <b>APP</b></li> </ol>	<p><b>Homework W2</b></p> <p>Homework:  <b>Collect images based on themes they might consider on the mood board on Page 4.</b></p>
<p><b>Week 3 Learning Outcomes:</b></p> <p><b>4. Client Research</b>  <i>Students will consider the needs and wants of the end user.</i>  <b>Students will be able to write</b> a profile of their potential client, demonstrate important facts about their target market by studying, analysing and recording details about their potential customer. Students will discuss and explain a detailed account of their client's background history, interests and preferences ready to drive their ideas using paragraphing and organising text into sections.</p> <ul style="list-style-type: none"> <li>Students will write in detail about their client by using correct and relevant technical terms, language and expression. (7.WL2)</li> <li>Students will write legibly and fluently ensuring correct use of paragraphs to organise a profile of their client. (7.WS4)</li> </ul> <p><b>5. Initial Ideas.</b>  <i>Students will develop design proposals through questioning and evaluating with peers.</i>  <b>Students will be able to</b> demonstrate how to create detailed designs developing initial ideas for their LED night light. Students must draw the</p>		<p><b>Success Criteria:</b></p> <ol style="list-style-type: none"> <li>Students will create a range of high quality sketches.</li> <li>All proposals will be annotated clearly with the correct technical terminology.</li> <li>Students will be showing an understanding of who their client is, along with relevant technical details along with use of suitable vocabulary.</li> <li>Students will show their ability to use paragraphs and organise longer pieces of writing.</li> <li>Student will understand the importance of</li> </ol>	<p><b>Homework W3</b></p> <p>Homework:</p>

<p>enclosure for the circuit, the acrylic “add on”, with the Light emitting through the acrylic shape. They must create four initial designs, shade them in neatly and evaluate / peer assess their work.</p> <ul style="list-style-type: none"> <li>• Students will discuss the success or shortcomings of the product with their Peers. (7.OL3)</li> <li>• Students will listen to feedback for peers and record the opinions received. (7.OC2)</li> </ul>		<p>discussing their ideas with others.</p>	
<p><b>Week 4 Learning Outcomes:</b></p> <p><b>6. Initial Ideas.</b>  <i>Students will develop design proposals through questioning and evaluating with peers.</i>  <b>Students will be able to</b> know how to complete all the tasks from the previous lesson’s work. They will need to record their original intensions, their own opinions and the gain opinions of others (peer assessment). They will know how to create four initial designs to the expected standard.</p> <ul style="list-style-type: none"> <li>• Students will discuss the success or shortcomings of the product with their Peers. (7.OL3)</li> <li>• Students will listen to feedback for peers and record the opinions received. (7.OC2)</li> </ul>		<p><b>Success Criteria:</b></p> <ol style="list-style-type: none"> <li>1. Students must understand the design process of developing and improving proposals.</li> <li>2. Communicate facts clearly in a logical order.</li> <li>3. Students must consider their literacy skills within this task.</li> <li>4. Student will understand the importance of discussing their ideas with others.</li> </ol>	<p><b>Homework W4</b></p> <p>Homework:</p>
<p><b>Week 5 Learning Outcomes:</b></p> <p><b>7. Initial Ideas.</b>  <i>Students will develop design proposals through questioning and evaluating with peers.</i>  <b>Students will be able to</b> understand how to develop one idea to form their final idea of their product. They will need to draw their chosen design in a high quality sketch and include internal views of their proposed circuit. Detailed measurements are required for the product and detailed reasons for choice. They will also consider tools and equipment needed.</p> <ul style="list-style-type: none"> <li>• Students will discuss the success or shortcomings of the product with their Peers. (7.OL3)</li> <li>• Students will listen to feedback for peers and record the opinions received. (7.OC2)</li> </ul> <p><b>8. Practical Lesson.</b>  <i>Students will develop manual dexterity, accuracy, precision, and craftsmanship through the use of tools, utensils, equipment and appropriate materials.</i>  <b>Students will be able to</b> demonstrate their practical skills of the circuit enclosure by:-</p> <ol style="list-style-type: none"> <li>1. Selecting and cutting components.</li> <li>2. Assemble all component parts to form a box to house the circuit.</li> </ol> <p>After a demonstration: Students will understand how to:-</p> <ul style="list-style-type: none"> <li>* assemble the frame of the box with PVA</li> <li>* attach the plywood enclosure to the assembled frame.</li> <li>* to clamp the work together.</li> </ul>	 <p>Assessment</p> <p><u>Summative Assessment:</u> Final 3D drawing</p> <p>Summative Assessment:</p> <p>Grade:</p> <p>Graded out of /30</p>	<p><b>Success Criteria:</b></p> <ol style="list-style-type: none"> <li>1. Students will be able to work in a safe environment to create their circuit enclosure.</li> <li>2. Student will understand the importance of discussing their ideas with others.</li> <li>3. SA</li> </ol>	<p><b>Homework W5</b></p> <p>Homework:</p> <p><b>Resistor Colour code factsheet.</b></p>
<p><b>Week 6 Learning Outcomes:</b></p> <p><b>9. Practical Lesson.</b>  <i>Students will develop manual dexterity, accuracy, precision, and craftsmanship through the use of tools, utensils, equipment and appropriate materials.</i>  <b>Students will be able to</b> demonstrate their ICT CAD/CAM skills by designing the Acrylic frieze on Techsoft 2D design software. After a demonstration: Students will understand how to.....</p> <ul style="list-style-type: none"> <li>* use the final logo and format the image so that it can be etched.</li> <li>* adjust the colour properties and convert them to a monochrome image.</li> <li>* add a contour to the acrylic frieze.</li> <li>* change the colour properties to define cutting and etching on the laser cutter (red and black lines / colours)</li> </ul> <ul style="list-style-type: none"> <li>• Students will learn how to track changes of a document and restore a previous version from their directory. The students will have to take account of image size and type, and will use many features of the TECHSOFT software to refine and adapt a JPEG image to make it useable on the Laser Cutter. (DL 2.3)</li> <li>• Students will learn by using TECHSOFT that they can use the tools to create and enhance text and images. They will learn also how to combine the components along with contouring to design the Acrylic frieze for their product. (DL 3.2)</li> </ul>		<p><b>Success Criteria:</b></p> <ol style="list-style-type: none"> <li>1. Students will fully understand the meaning of CAD/CAM along with its advantages and disadvantages.</li> <li>2. Students will be able track changes of a document and restore a previous version. The students will be able to take account of image size and type, and will use many features of the TECHSOFT software to refine and adapt a JPEG.</li> <li>3. Students will be able to use TECHSOFT to create, enhance, text and images along with contouring to design the Acrylic frieze.</li> </ol>	<p><b>Homework W6</b></p> <p>Homework:</p>

<p><b>Week 7 Learning Outcomes:</b></p> <p><b>10. Practical Lesson.</b>  <i>Students will develop manual dexterity, accuracy, precision, and craftsmanship through the use of tools, utensils, equipment and appropriate materials.</i>  <b>Students will be able to</b> demonstrate their practical skills by preparing the enclosure for the circuit and solder a series circuit by:</p> <ol style="list-style-type: none"> <li>1. Drilling appropriate holes for the LEDs</li> <li>2. Selecting electronic components.</li> <li>3. Assembling all component parts to form a circuit.</li> </ol> <p>After a demonstration: Students will understand how to:-</p> <ul style="list-style-type: none"> <li>* assemble and drill 3 equally spaced holes for LEDs with appropriate measuring and marking tools.</li> <li>* solder the LEDs, Resistor and Switch in to a functioning series circuit <ul style="list-style-type: none"> <li>• Students will learn how to mark and measure the locations of the 3 equally spaced holes to the nearest millimetre. (7.M1)</li> <li>• Students will listen to series of instructions of processes and sequences and will use these to plan their production stages. (OL.3)</li> </ul> </li> </ul> <p><b>11. Students will be able to</b> demonstrate their practical skills by preparing the enclosure for the circuit and solder a series circuit: They will need to assemble all component parts to form a circuit. The students will understand how CAD/CAM works with a demonstration on how the laser cutter is used. They will also understand about use correct settings for Speed and Power of the Laser.</p>		<p><b>Success Criteria:</b></p> <ol style="list-style-type: none"> <li>1. Students will be able to understand how to solder a Series circuit and appreciate the need for correct polarity.</li> <li>2. Students will be able to mark out accurately using millimetres the locations of their holes to receive the LEDs.</li> <li>3. They will be able to follow verbal instructions to plan their work.</li> </ol>	<p><b>Homework W7</b> Homework:</p>
<p><b>Week 8 Learning Outcomes:</b></p> <p><b>12. Practical Lesson.</b>  <i>Students will safely use appropriate tools, materials, and equipment, to methodically construct purposeful outcomes.</i>  <b>Students will be able to</b> demonstrate their practical skills by assembling and gluing the acrylic frieze in position:- They will need to...</p> <ol style="list-style-type: none"> <li>1. attach the acrylic supports for the frieze.</li> <li>2. attach the frieze in between acrylic supports.</li> <li>3. sand and apply a finish (oil) to the wooden enclosure.</li> </ol> <p>After a demonstration: Students will understand how to.....</p> <ul style="list-style-type: none"> <li>* glue the acrylic supports for the frieze after shaping on the sander.</li> <li>* sand the box in the direction of the grain after removing construction lines.</li> <li>* apply an oiled finish to the enclosure. <ul style="list-style-type: none"> <li>• Students will listen to series of instructions of processes and sequences and will use these to plan their production stages. (OL.3)</li> </ul> </li> </ul>		<p><b>Success Criteria:</b></p> <ol style="list-style-type: none"> <li>1. Students will be able to work in a safe environment to create a lid for their Circuit enclosure.</li> <li>2. Students will have learnt how to apply a finish and apply a good quality finish.</li> <li>3. They will be able to follow verbal instructions to plan their work.</li> </ol>	<p><b>Homework W8</b> Homework:</p>
<p><b>Week 9 Learning Outcomes:</b></p> <p><b>13 &amp; 14. Practical Lesson.</b>  <i>Students will safely use appropriate tools, materials, and equipment, to methodically construct purposeful outcomes.</i>  <b>Students will be able to</b> demonstrate their constructional skills by attaching a lid to the enclosure.</p> <p>After a demonstration: Students will understand how to:-</p> <ul style="list-style-type: none"> <li>* attach the supporting structure for pivot arrangement.</li> <li>* mark out the location of pivot points.</li> </ul> <p>The students will also undertake a numeracy task and the mathematical reasoning task to record the locations of holes.</p> <ul style="list-style-type: none"> <li>• Students will listen to series of instructions of processes and sequences and will use these to plan their production stages. (OL.3)</li> </ul>	<p><u>APP task:</u> Circuit design and Numeracy Task</p> <div style="border: 1px solid blue; padding: 2px; width: fit-content; margin: 5px auto;">APP</div> <div style="border: 1px solid red; padding: 2px; width: fit-content; margin: 5px auto;">Grade:</div> <p>Graded out of /15</p>	<ol style="list-style-type: none"> <li>1. Students will work in a safe environment to create a lid for their Circuit enclosure.</li> <li>2. Students will learn how to apply a finish and apply a good quality finish.</li> <li>3. <b>APP</b></li> <li>4. They will be able to follow verbal instructions to plan their work.</li> </ol>	<p><b>Homework W9</b> Homework:</p>
<p><b>Week 10 Learning Outcomes:</b></p> <p><b>15. Manufacturing Process.</b>  <i>Students will use prototyping as a link between designing and making.</i>  <b>Students will be able to</b> demonstrate their understanding of the practical activities by recording all stages of the manufacturing process in detail. The students will complete the Production Flowchart pages within their folder. They will be listing the manufacturing stages and the equipment needed and referring to quality control issues.</p>		<p><b>Success Criteria:</b></p> <ol style="list-style-type: none"> <li>1. Students will be able to record each manufacturing stage in detail considering timings, skills and quality control issues.</li> </ol>	<p>Homework:</p> <p><b>Health and safety soldering poster.</b></p>

<p><b>Week 11 Learning Outcomes:</b></p> <p><b>16 &amp; 17. Manufacturing Process.</b>  <i>Students will use prototyping as a link between designing and making.</i>  <b>Students will be able to</b> demonstrate their understanding of the project by completing numeracy and mathematical reasoning tasks on problem solving to record the locations of the holes for the LED's.</p> <ul style="list-style-type: none"> <li>Students will learn how to mark and measure the locations of the 3 equally spaced holes to the nearest millimetre. (7.M1)</li> <li>Students will learn how to work out perimeter of their enclosure. (7.M2)</li> </ul>		<p><b>Success Criteria:</b></p> <ol style="list-style-type: none"> <li>Students will have used problem solving and used lateral thinking to solve a numeracy task.</li> <li>Students will be able to mark out accurately using millimetres the locations of their holes.</li> <li>Students will be able to work out perimeter of their enclosure.</li> </ol>	<p><b>Homework W11</b></p> <p>Homework:</p>
<p><b>Week 12 Learning Outcomes:</b></p> <p><b>18. Final Design and Production Costs.</b>  <i>Students will justify design decisions based on factors.</i>  <b>Students will be able to</b> demonstrate their understanding of electronics by creating a detailed circuit drawing of their final outcome. They will need to label / annotate them clearly and draw a technical drawing outlining all the measurements and components used. The students will also know how to calculate the production costs of manufacturing their product.</p>		<p><b>Success Criteria:</b></p> <ol style="list-style-type: none"> <li>The students will be able to draw a high quality final design drawing is needed which is clearly annotated using the key technical terminology</li> <li>SA</li> </ol>	<p><b>Homework W12</b></p> <p>Homework:</p> <p>Parental Evaluation.</p> <p>Students will ask their parents for their opinions. Students are responsible for recording their findings.</p>
<p><b>Week 13 Learning Outcomes</b></p> <p><b>19 &amp; 20 Evaluate their products.</b>  <i>Students will apply creativity and imagination to understand there is often more than one solution.</i>  <b>Students will be able to</b> demonstrate their literacy skills by evaluating the product against the original specification outlined within the folder. They will know how to evaluate the final outcome, their progress, and the suitability of the item. They will also gain the opinions of peers (2 friends) and consider the production cost of the item. They need to evaluate the project against the comments made on the Design Specification task based on: Aesthetics, Size, Safety, Customer, Materials, and Environment. All questions need to be answered fully and honestly. They will also evaluate their own progress using 2 seren a chwestiwn - recording 2 things that went well and 1 that could have been improved. They will glue a photo of the final outcome on this page.</p> <ul style="list-style-type: none"> <li>Students will learn what is an evaluation and how it relates to the Specification.</li> <li>Students will discuss with peers the successes and shortcomings of the Product.</li> <li>Students will evaluate in detail about successes and failures of their by using correct and relevant technical terms, language and expression. (7.WL2)</li> <li>Students will write legibly and fluently ensuring correct use of paragraphs to organise their evaluative comments. (7.WS4)</li> </ul>		<p><b>Success Criteria:</b></p> <ol style="list-style-type: none"> <li>Students will understand what is an Evaluation and that it is linked to the Specification to judge success and failure.</li> <li>Students will be able to write a detailed evaluation using relevant technical details along with use of suitable vocabulary.</li> <li>Students will be able to suggest both in written form and drawing modifications and improvements to the product.</li> <li>SA</li> </ol>	<p><b>Homework W13</b></p> <p>Homework:</p> <p>Suggested improvements.</p> <p>Evaluation suggestion and sketches of improvements.</p>
<p><b>Week 14 Learning Outcomes:</b></p> <p><b>Students will be able to</b> demonstrate how to review, revisit and refine previous work to ensure quality.</p>		<p><b>Success Criteria:</b></p> <ol style="list-style-type: none"> <li>Students must write in a clear, accurate and logical manner. This piece of extended writing must be communicated clearly and in detail.</li> <li>Students will suggest modifications and improvements</li> </ol>	<p><b>Homework W14</b></p>

**This programme is subject to change.**