

| Meden School Curriculum Planning | | | | | | | |
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| Subject | D&T | Year Group | 9 | Sequence No. | 1&2 | Topic | Lamp 1 & 2 |

| Retrieval | Core Knowledge | Student Thinking |
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| What do teachers need retrieve from students before they start teaching new content ? | What specific ambitious knowledge do teachers need teach students in this sequence of learning? | What real life examples can be applied to this sequence of learning to development of our students thinking, encouraging them to see the inequalities around them and 'do something about them!' |
| <p><input type="checkbox"/> The work done in the Y8 Graphics module regarding drawing in 3D, (Isometric and Perspective) and the use of 'crating' to improve sketches. Also the use of thick and thin line techniques and two specific rendering techniques.</p> <p><input type="checkbox"/> The work done in the Y8 Train module relating to technical (orthographic) drawing. Although the students will not be 'drawing in orthographic' here that module covered concepts including drawing to scale, the types of lines to use to show centre lines, hidden detail etc.</p> <p><input type="checkbox"/> Reference should be made back to the mechanisms module done in Y7 where the students made card automata and had to be VERY precise and accurate. Explain that similar is required here. Also the "Developing Design Ideas"</p> | <p>The following ambitious knowledge needs to be taught:</p> <p><input type="checkbox"/> What is meant by the term 'design constraints' and how these will impact on design work.</p> <p><input type="checkbox"/> The features of the 'Meden House Style' design page and the elements that particularly apply to this design activity, (Main sketch in 3d, Detail sketched possibly in 2D, detailed annotation, material choices, manufacture method, explanation of the compliance with the constraints).</p> <p><input type="checkbox"/> The reason for modelling a design – how it might help the designer and the client.</p> <p><input type="checkbox"/> The use of blue foam as a modelling material, and how to minimise waste when using the blue foam.</p> <p><input type="checkbox"/> The difference between physical modelling and virtual modelling and the advantages/disadvantages of virtual modelling.</p> <p><input type="checkbox"/> How injection moulding works and is done, and what over-moulding is and where it is used that students would already be familiar with.</p> <p><input type="checkbox"/> What composites are, with examples of (including glass reinforced plastic) and how concrete is an example of a composite.</p> <p><input type="checkbox"/> Mixing proportions for concrete.</p> <p><input type="checkbox"/> Casting of concrete (which is typically more of a construction process) and how this relates to other forms of casting more frequently seen within D&T.</p> <p><input type="checkbox"/> Sand casting of aluminium, (demonstrated from video) the process and names of each of the key tools/materials.</p> | <p><input type="checkbox"/> The reasons for minimising waste, and strategies used by manufacturing companies to achieve this including "Just in Time" manufacturing.</p> <p><input type="checkbox"/> Students consider how a design could be altered to meet the needs of consumers with a variety of additional needs – e.g. the switching on and off of the lamp for those with limited hand/finger function due to rheumatoid arthritis or impaired fine motor skills.</p> <p><input type="checkbox"/> Consider the environmental impact of concrete – see the article at this link where it is described as "The most destructive material on earth". https://www.theguardian.com/cities/2019/feb/25/concrete-the-most-destructive-material-on-earth</p> <p><input type="checkbox"/> Acknowledge that using concrete in a lamp is an unusual application of the material. Set an extension activity to encourage the development of student thinking to identify other products where a material is used outside of its usual applications and context.</p> <p><input type="checkbox"/> When carrying out a practical process we always teach or review safety procedures and provide safety equipment. Within the workplace within the UK there is the Health & Safety at Work Act 1974 – which sets out the obligations on</p> |

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| <p>Knowledge Organiser from the Y7 Engineering Challenges module which looked at a variety of accurate modelling methods and materials.</p> <p><input type="checkbox"/> Students will be familiar with products from real life that have used over-moulding, (e.g. toothbrush) and so links to these products should be made when discussing injection moulding.</p> <p><input type="checkbox"/> Reference should be made back to the Y7 Passive amp and the Y8 Train projects where the safe and correct use of the sander, pillar drill, fretsaw, hand saws and templates were considered.</p> <p><input type="checkbox"/> Retrieval in relation to knowledge regarding manufactured boards and plywood in particular should be made as students covered this material area during the passive amp project in Y7.</p> <p><input type="checkbox"/> Students will be familiar with the laminating of paper/card with a plastic sheet – reference this when introducing the lamination of timber.</p> <p><input type="checkbox"/> Retrieval in relation to knowledge regarding Vacuum</p> | <p><input type="checkbox"/> The meaning of the term ‘laminating’ in relation to timber and how it relates to forms of laminating students are already familiar with.</p> <p><input type="checkbox"/> Understand the process of laminating from viewing the video, looking at existing products and teacher demonstration – before carrying out for themselves.</p> <p><input type="checkbox"/> The correct, skilful and safe use of the vertical sander to make edges smooth and product pieces accurate, specifically including:</p> <ul style="list-style-type: none"> - Wearing an apron and visor/goggles. - The location of start/stop buttons and emergency stops. - The need to tie back long hair, ensure ties/lanyards are tucked away. - The fact that it is a one-person machine and only one person is allowed in/over the box area marked on the floor. - The fact that the machine is only used to remove SMALL amounts of material and that if there are larger areas of waste these should be cut off before the last one or two mm are sanded away. - That the workpiece MUST ALWAYS be sat, flat on the table & that holding pieces up against the belt is not done. Also how to achieve this when sanding a curved piece. <p><input type="checkbox"/> Understand the process of laminating from viewing the video, looking at existing products and teacher demonstration – before carrying out a brief ‘experience’ individual activity for themselves.</p> <p><input type="checkbox"/> The correct, knowledge based, skilful use of the vacuum former and gerbil to make the vacuum formed cone including:</p> <ul style="list-style-type: none"> - What draft angles are and why they are essential. - The different parts and functions of the machine. - The steps in the vac from process. - Where to position the mould(s) to maximise success. - How to secure the HIPS sheet. - How to remove the mould once formed. - How to use the gerbil, holding the surrounding sheet down onto the table during the cutting process to achieve a smoother finished edge and avoid steps or spiralling. | <p>both employer and employee in or to maintain safety in the workplace (review key contents). A lot of the products we buy though were not made in the UK. Consider:</p> <ul style="list-style-type: none"> - How might the working conditions been different for the manufacture of some of the product we buy? - What could the impact of these conditions be? - How could we as consumers act in order to try and reduce these issues? |
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| <p>forming and the use of the gerbil should be made. These processes have been encountered in the Y7 Mini-monster blister pack and the Y8 frisbee modules.</p> <p><input type="checkbox"/> Retrieval in relation to knowledge regarding electronics and the manufacture of a circuit board should be made as these processes have been encountered in the Y8 nightlight/frisbee module.</p> <p><input type="checkbox"/> Retrieval of knowledge regarding the terms Thermoplastics and Thermoset plastics should be made. These terms have been encountered in the Y8 nightlight module.</p> <p><input type="checkbox"/> Retrieval in relation to knowledge regarding Line bending and the use of the hot wire strip heater should be made. These processes have been encountered in the Y8 nightlight module.</p> | <p><input type="checkbox"/> What masking is in relation to spray painting, why/how it is done.</p> <p><input type="checkbox"/> Steps taken to achieve higher quality and safe spray paintings, specifically to include:</p> <ul style="list-style-type: none"> - Creating a 'key' on a smooth surface. - Use of a primer. - Working within a spray booth. - Techniques to achieve an even, smooth and drip/run free surface including constant movement, range, and building up thin layers. <p><input type="checkbox"/> The function and use of each of the parts and components within the circuit elements specifically including:</p> <ul style="list-style-type: none"> - What strip board is and how it is used. - Why the toggle switch has three contacts, and how those contacts relate to the 'Single Pole, Double Throw' circuit diagram. - The details of the LED's and the fact that the intentionally shorter leg and slight flat side indicate polarity. <p><input type="checkbox"/> The correct, knowledge based, skilful use of the soldering iron to build the circuit specifically including:</p> <ul style="list-style-type: none"> - Safety precautions in relation to their use. - Cleaning and 'tinning' the soldering iron tips. - Heating the leg and copper strip prior to introducing the solder. - The use of crocodile clips as a heat sink. - Using wire and wire strippers. - Using side cutters. <p><input type="checkbox"/> The correct, knowledge based, skilful use of the hot wire strip heater/line bender to shape plastic specifically including:</p> <ul style="list-style-type: none"> - Thermoplastics and Thermosets and their differences/application. - How the strip heater is used. - Positioning the acrylic piece. - Timing and getting an accurate bend angle. | |
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