

**CAD CAM: D&T DEPARTMENT CURRICULUM MAP 2022-2023**

Year 7 (One term)		Year 8 (One term)		Year 9 (7 weeks)	
THEORY	PRACTICAL SKILLS	THEORY	PRACTICAL SKILLS	THEORY	PRACTICAL SKILLS
<p><b>Knowledge &amp; Understanding</b> Coordinates, Measurements, Use of grids and step-spacing to produce accurate drawings.</p> <p>Production of drawings for output via computer-controlled machinery.</p> <p>Links between CAD and CAM, examples of different CAM machines such as Laser Cutter, 3d Printer, CNC Router, Computer-controlled embroidery machine and vinyl-cutter.</p> <p><b>Researching</b> Use of a mood-board to inspire creative designing</p> <p>Use of repeat pattern tool (or duplicate tool) to emulate the work of Orla Keily.</p> <p><b>Design development</b> Taking inspiration from other designers. Emulating their work with the software and on paper. Translating pencil / cardboard modelling ideas onto CAD.</p>	<p><b>Drawstring Bag project</b> Drawing lines – on grid, free and also using the step spacing. Multiple lines – grouping, deleting complete lines / entities. Deleting parts of line (up to nearest intersection).</p> <p>Use of the Bezier-spline (or path) tool for smooth curves. Circles, ovals. Construction of complex shapes from overlapping shapes, deleting the remaining parts.</p> <p>Resizing the workspace to the correct size.</p> <p>Saving work correctly.</p> <p>Export of the file to DXF format.</p> <p><b>Health and Safety</b> Preparing a file for laser cutting.</p> <p>Occasional supervised setting up and operation of the machine.</p> <p>Not staring into the beam. Checking all guards are intact and in the correct position.</p> <p>Cutting fabrics – requirements f or LEV to remove fumes from cutting or organic / inorganic / synthetic fabrics. Watching for fire hazards. Access to fire extinguishers, knowing where the stop for the LEV is so that enhanced airflow can be removed, limiting the spread of fire.</p>	<p><b>Knowledge &amp; Understanding</b> More processes requiring CAD/CAM. Open choice of processes to include Computer-controlled embroidery and vinyl-cutter for stencils.</p>	<p>Computer-controlled embroidery: Setting up the hoop, conversion using the Janome customiser software and transfer to the embroidery machine.</p> <p>Preparation of a CAD file to be cut using the CAMM-1 or Roland Stika vinyl-cutter for stencils. Weeding of vinyl stencils. Stencilling process.</p> <p><b>New 2-leg walker project</b> Introduction to CAD (Necessary for those who haven't completed the Year 7 project due to COVID)</p> <p>Drawing lines – on grid, free and also using the step spacing. Multiple lines – grouping, deleting complete lines / entities. Deleting parts of line (up to nearest intersection).</p> <p>Use of the Bezier-spline (or path) tool for smooth curves. Circles, ovals. Construction of complex shapes from overlapping shapes, deleting the remaining parts.</p> <p>Resizing the workspace to the correct size.</p> <p>Saving work correctly.</p> <p>Creation of leg/arm patterns using the Leg/Arm templates.</p> <p>Export of the file to DXF format.</p> <p><b>Health and Safety</b> Preparing a file for laser cutting.</p> <p>Occasional supervised setting up and operation of the machine.</p> <p>Not staring into the beam. Checking all guards are intact and in the correct position.</p> <p>Cutting fabrics – requirements f or LEV to remove fumes from cutting or organic / inorganic / synthetic fabrics. Watching for fire hazards. Access to fire extinguishers, knowing where the stop for the LEV is so that enhanced airflow can be removed, limiting the spread of fire.</p>	<p><b>Knowledge &amp; Understanding</b> Solidworks as CAD software. Links to local and international business. The world of work. Looking forward to work experience and careers.</p> <p>3d CAD as a tool for communicating – an alternative to hand-sketching. Sizing, measuring, units and scale.</p> <p>3d CAD as a preparation for rapid-prototype production. Looking at areas that might prevent a satisfactory print. Rafting and support material.</p> <p>Onsite and offsite third-party manufacture. Different materials.</p> <p>Packaging requirements, CE marking and official standards. Commerce / stock control with barcodes. Marketing. Analysis of existing packaging.</p> <p>Packaging nets – linking to Maths, covering 2d to 3d conversion.</p>	<p><b>3d CAD/CAM</b> Solidworks tools: Sketching of 2d shapes, extrusion to become 3d forms.</p> <p>Cutting/Subtraction. Filleting, chamfering.</p> <p>Additional sketches becoming additional extrusions.</p> <p>Turning a model into a 2-dimensional orthographic drawing with plan views, side views and front views.</p> <p>Saving the file in a format suitable for 3d printing.</p> <p>Colouring, rendering, communicating ideas effectively.</p> <p>Production of a piece of packaging using a template. Correct placement of key information. Assembly of the packaging / paper bag as an extension.</p> <p>Getting the final product 3d printed.</p>
<p>Link to GCSE: H&amp;S, Computer-controlled embroidery and vinyl-cutter for stencils.</p>	<p>Link to GCSE: Scale, full-size working. Knowledge of technical terms, manufacturing processes including CAD/CAM processes.</p>	<p>Link to GCSE: Further understanding of the CAD/CAM processes.</p>	<p>Link to GCSE: An ability to draw on the knowledge gained when deciding on appropriate processes for practical work.</p>	<p>Link to GCSE: Very specifically setting up the knowledge and understanding necessary to produce designs. An additional form of communication. Development of a product from sketches. Maths – size, volume, units, nets / developments. Spatial awareness of a 2d shape becoming a 3d product. Awareness of target client/user/market. Meeting the needs of a specification.</p>	<p>Link to GCSE: Using the processes to create a product for 3d printing as a part-prototype for the NEA. An awareness of how to design for manufacture.</p>
<p><b>ASSESSMENT</b> Assessed on the cover of the booklets – 8 common assessment criteria</p>	<p><b>ASSESSMENT</b> Verbal feedback to correct technique. Overall assessment on the cover of the booklets (planning and making)</p>	<p><b>ASSESSMENT</b> Assessed on the cover of the booklets – 8 common assessment criteria</p>	<p><b>ASSESSMENT</b> Verbal feedback to correct technique. Overall assessment on the cover of the booklets (planning and making)</p>	<p><b>ASSESSMENT</b> Assessed on the cover of the booklets – 8 common assessment criteria</p>	<p><b>ASSESSMENT</b> Verbal feedback to correct technique. Overall assessment on the cover of the booklets (planning and making)</p>