**Key Stage 3 Curriculum Vision**

Our Design & Technology Key Stage 3 curriculum has been developed to provide students with a rich and broad range of projects that align with the UK National Curriculum and prepare our students for Key Stage 4 & 5. We blend skills based learning with knowledge and creativity to allow students to express themselves within a structure that scaffolds tasks without constraining autonomy and individual flair. Embedded within our KS3 curriculum are the core principles of **design, make, evaluate** utilising **technical knowledge** to create outcomes.

The curriculum is assessed across four key objectives being **research and investigation**, **initial ideas and observations**, **development and refinement** and **final outcomes**. Within each pillar we enable students to combine practical, technological and artistic skills with creative thinking to design and make products, graphics and systems that meet human needs and wants. Students gain experience in using tools and machinery, computer aided design, computer aided manufacture, electronics and graphics using specialist software from the Adobe Suite. We promote creativity, flair and originality and we encourage all students to take risks and push the boundaries using authentic design processes.

To maximise the use of machinery, equipment and IT suites we run a carousel system including all projects where students engage in 3 projects per academic year but in different terms.

The beginning of each year begins with a revisit to basic sketching skills and colour rendering as well as H&S in the workshop.

## Year 7 Overview

**Year 7 – Desktop Rollercoaster**

**Year 7 – Iconic**

**Year 7 – Doorhanger**

| Topic Title | Desktop Rollercoaster |
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| **Pupils will know** | ● To know health & safety rules in a workshop.<br>● To be able to identify hand tools (tenon saw, coping saw, file, try square).<br>● To be able to identify machinery (pillar drill, belt sander, hand drill, scroll saw, heat gun).<br>● To safely use machinery in line with health and safety regulations.<br>● To understand timber types: hardwoods, softwoods and manufactured boards<br>● To understand plastics: thermoplastics and thermosetting plasticses. |
| **Pupils will know how to (procedural knowledge)** | ● Know how to create inspirational research based on analysis of existing designers<br>● Know how to generate creative ideas inspired by research<br>● Know how to create scale templates for marking out to |

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| | increase accuracy<br>● Know how to mark out work accurately<br>● Know how to remove material using a range of saw and drills<br>● Know how to finish material using sanders and sand paper<br>● Know how to apply paint to man made boards<br>● Know how to manipulate acrylic using a heat gun<br>● Know how to show and present the design process in Google Slides |
| **Core knowledge to know and remember to progress to later learning (foundational knowledge)** | ● Core understanding of safe workshop practices (hair up, aprons, no loose clothing, goggles, guards, clamping)<br>● Core understanding of how to use hand tools to manipulate and finish materials<br>● Core understanding of how to use machinery to manipulate and finish materials<br>● Core understanding of the use of Google Slides to present a clear design process including research, design ideas, development and outcomes |
| **Prior knowledge** | The carousel system means that each student's prior knowledge will differ at different stages.<br><br>● Basic awareness of tools/materials from KS2 (varies significantly).<br>● Some students may have minimal experience of making.<br>● Some students may have some experience of sketching and rendering ideas.<br>● Some students may have minimal experience of using Google Suite. |
| **Future knowledge** | ● Preparation for future workshop practical lessons<br>● Preparation for documenting the design process in Google Slides |
| **Key vocabulary** | **Tools**<br>Template - Coping Saw - Belt Sander - Pillar Drill - Hand Drill - Files - Heat Gun - Bobbing Sander - Sand paper -<br><br>**H&S**<br>Aprons - Goggles - Guards - Clamping<br><br>**Materials**<br>MDF - Plywood - Acrylic - Aluminium |

| Topic Title | Iconic |
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| **Pupils will know** | ● To resource high quality images capable of being used to create professional outcomes<br>● To generate create layout ideas inspired by research<br>● To experiment with Adobe software to develop ideas graphically to produce professional outcomes |

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| **Pupils will know how to (procedural knowledge)** | • Know how to generate creative 2D sketching<br>• Know how to create new files and sketches in Onshape<br>• Know how to extrude in Onshape both adding and removing material<br>• Know how to insert images and trace in Onshape<br>• Know how to mirror in Onshape<br>• Know how to assemble in Onshape<br>• Know how to export files as DXF's to send to the lasercutter<br>• Know how to laminate and apply a paint finish to lasercut outcomes<br>• Know how to show and present the design process in Google Slides |
| **Core knowledge to know and remember to progress to later learning (foundational knowledge)** | • Core understanding of the process to develop sketches in to 3D CAD<br>• Core understanding of preparing files for lasercutting and CAM<br>• Core understanding of presenting the design process in Google slides |
| **Prior knowledge** | The carousel system means that each student's prior knowledge will differ at different stages.<br><br>• Basic awareness of tools/materials from KS2 (varies significantly).<br>• Some students may have minimal experience of making.<br>• Some students may have some experience of sketching and rendering ideas.<br>• Some students may have minimal experience of using Google Suite. |
| **Future knowledge** | • Preparation for future Adobe projects (A Night at the Movies) |
| **Key vocabulary** | Eraser - Paintbrush - Bucket - Overlay - Glow - Filters - Special Effects - Layers |

| **Topic Title** | **Doorhanger** |
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| **Pupils will know** | • To know health & safety rules in a workshop.<br>• To be able to identify Electronic Components (battery clip, tilt switch, LED's, resistors).<br>• To be able to identify machinery (pillar drill)<br>• To safely use machinery in line with health and safety regulations.<br>• To understand the soldering process and how to do this safely and identify the tools + equipment (soldering Iron, solder, bulldog clip, cleaner, wire strippers, snips)<br>• To understand electronic circuits and how they work. s. |

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| **Pupils will know how to (procedural knowledge)** | ● Know how to create a successful electronics circuit<br>● Know how to generate creative ideas inspired by research<br>● Know how to solder accurately and correctly<br>● Know how to mark out work accurately using templates<br>● Know how to drill holes using the pillar drill<br>● Know how to apply paint to man made boards<br>● Know how to record their skills and manufacturing process<br>● Know how to show and present the design process in Google Slides |
| **Core knowledge to know and remember to progress to later learning (foundational knowledge)** | ● Core understanding of safe workshop practices (hair up, aprons, no loose clothing, goggles, guards, clamping)<br>● Core understanding of how to use hand tools to solder a circuit safely<br>● Core understanding of electronics and how circuits work<br>● Core understanding of how to use the pillar drill safely<br>● Core understanding of the use of Google Slides to present a clear design process including research, design ideas, development and outcomes |
| **Prior knowledge** | The carousel system means that each student's prior knowledge will differ at different stages.<br><br>● Basic awareness of tools/materials from KS2 (varies significantly).<br>● Some students may have minimal experience of making.<br>● Some students may have some experience of sketching and rendering ideas.<br>● Some students may have minimal experience of using Google Suite. |
| **Future knowledge** | ● Preparation for future workshop practical lessons<br>● Preparation for documenting the design process in Google Slides |
| **Key vocabulary** | **Tools**<br>Template - circuit boards - soldering iron - Pillar Drill - marker - velcro - solder<br><br>**H&S**<br>Aprons - Glasses - Guards - Goggles - Hair tied back - Stools away - clips to hold work<br><br>**Materials**<br>MDF - Circuit boards - Solder - tilt switch - LED - Batter holder - Resistor |

## Year 8 Overview

**Year 8 – Onshape 3D CAD**

**Year 8 – Ocean**

**Year 8 – Wacky Racer**

| Topic Title | Onshape 3D CAD |
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| **Pupils will know** | • To know the meaning of CAD / CAM<br>• To know how to generate 2D sketch ideas and convert to 3D Onshape<br>• To know how to prepare files ready for lasercutting<br>• To know how to laminate layers of MDF to create 3D objects and apply a painted finish |
| **Pupils will know how to (procedural knowledge)** | • Know how to generate creative 2D sketching<br>• Know how to create new files and sketches in Onshape<br>• Know how to extrude in Onshape both adding and removing material<br>• Know how to insert images and trace in Onshape<br>• Know how to mirror in Onshape<br>• Know how to assemble in Onshape<br>• Know how to export files as DXF's to send to the lasercutter<br>• Know how to laminate and apply a paint finish to lasercut outcomes<br>• Know how to show and present the design process in Google Slides |
| **Core knowledge to know and remember to progress to later learning (foundational knowledge)** | • Core understanding of the process to develop sketches in to 3D CAD<br>• Core understanding of preparing files for lasercutting and CAM<br>• Core understanding of presenting the design process in Google slides |
| **Prior knowledge** | The carousel system means that each student's prior knowledge will differ at different stages.<br><br>• Good awareness of tools/materials from Y7<br>• Good experience of making and painting outcomes and physical products from Y7<br>• Good experience of sketching 2D from Y7<br>• Good experience of using Google suite and documenting the design process. |
| **Future knowledge** | • Preparation for future workshop practical lessons<br>• Preparation for documenting the design process in Google Slides |
| **Key vocabulary** | CAD - CAM - Sketch - Extrude - Plane - Mirror - Lasercutting |

| Topic Title | Lantern |
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| **Pupils will know** | • To know health & safety rules in a workshop.<br>• To be able to identify hand tools (coping saw, file, try square).<br>• To be able to identify machinery (pillar drill, belt sander)<br>• To safely use machinery in line with health and safety |

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| | regulations.<br>● To gain knowledge of a designer and analyse their work looking into 3D Form and thor inspiration<br>● Use inspiration from their research to create their own creative designs in the same style |
| **Pupils will know how to (procedural knowledge)** | ● Know how to create inspirational research based on analysis of existing designer using descriptive wording<br>● Know how to generate creative well drawn ideas in the style of their artist<br>● Know how to mark out work accurately using templates<br>● Know how to remove material accurately using a range of saw and drills<br>● Know how to finish material using sanders and sand paper<br>● Know how to create a complex wood joint accurately<br>● Know how to show and present the design process in Google Slides in a creative way graphically |
| **Core knowledge to know and remember to progress to later learning (foundational knowledge)** | ● Core understanding of safe workshop practices (hair up, aprons, no loose clothing, goggles, guards, clamping)<br>● Core understanding of how to use hand tools to manipulate and finish materials<br>● Core understanding of how to use machinery to manipulate and finish materials<br>● Core understanding of the use of Google Slides to present a clear design process including research, design ideas, diary of making, development and outcomes |
| **Prior knowledge** | The carousel system means that each student's prior knowledge will differ at different stages.<br><br>● Basic awareness of tools/materials from KS2 (varies significantly).<br>● Some students may have minimal experience of making.<br>● Some students may have some experience of sketching and rendering ideas.<br>● Some students may have minimal experience of using Google Suite. |
| **Future knowledge** | ● Preparation for future workshop practical lessons<br>● Preparation for documenting the design process in Google Slides |
| **Key vocabulary** | **Tools**<br>Template - Coping Saw - Belt Sander - Pillar Drill - Hole saw - files - sand paper - try square - glue gun<br><br>**H&S**<br>Aprons - Goggles - Guards - Clamping<br><br>**Materials**<br>MDF - Plywood - Tracing paper |

| Topic Title | Wacky Racer |
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| **Pupils will know** | • To know how to generate 2D sketch ideas from their research<br>• To know how to generate a 3D foam outcome from their ideas and finish it correctly<br>• To know health & safety rules in a workshop.<br>• To know how to recognise more complex Electronic Components (battery clip, capacitor, thyristor, toggle switch, motor, resistors)<br>• To be able to identify machinery (vacuum Former, Gerbil, Piller Drill)<br>• To understand plastics and the groups of plastics<br>• To safely use machinery in line with health and safety regulations.<br>• To understand the soldering process and how to do this safely and identify the tools + equipment (soldering Iron, solder, bulldog clip, cleaner, wire strippers, snips)<br>• To understand why we use jigs for drilling we use Jigs s |
| **Pupils will know how to (procedural knowledge)** | • Know how to generate creative 2D sketching<br>• Know how to create a 3D Foam shape<br>• Know how to use hand tools accurately and safely<br>• Know how to use the vacuum former and Gerbil correctly<br>• Know how to use the pillar drill safely<br>• Know how to use a jig<br>• Know how to solder accurately and safely<br>• Know how to manufacture a more complex electronic circuit successfully.<br>• Know how to show and present the design process in Google Slides<br>• Know the groups of plastics and where they are used. |
| **Core knowledge to know and remember to progress to later learning (foundational knowledge)** | • Core understanding of the process to develop their 2D design into 3D form<br>• Core understanding of using the vacuum former and Gerbil<br>• Core understanding of using the pillar drill and jigs<br>• Core understanding of soldering a successful more complex circuit safely<br>• Core understanding of the new components used within their circuit and how they work<br>• Core understanding of presenting the design process in Google slides |
| **Prior knowledge** | The carousel system means that each student's prior knowledge will differ at different stages.<br><br>• Good awareness of tools/materials from Y7<br>• Good experience of making and painting outcomes and physical products from Y7<br>• Good experience of sketching 2D from Y7<br>• Good experience of using Google suite and documenting the design process. |

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| **Future knowledge** | ● Preparation for future workshop practical lessons<br>● Preparation for documenting the design process in Google Slides |
| **Key vocabulary** | **Tools**<br>Template - circuit boards - soldering iron - Pillar Drill - vacuum former - Gerbil - solder - Former - Jigs - Drill bit - Wet + Dry paper<br><br>**H&S**<br>Aprons - Glasses - Guards - Goggles - Hair tied back - Stools away - clips to hold work<br><br>**Materials**<br>HIPS plastics - Circuit boards - Solder - toggle switch - Motor - Battery holder - Resistor - thyristor - capacitor - Thermo plastics - Thermosetting plastics - heat shrink - |

**Year 9 overview**

**Year 9 – A Night at the Movies**

**Year 9 – Wearable Fantasy**

**Year 9 – Lantern**

| **Topic Title** | **A Night at the Movies** |
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| **Pupils will know** | ● A range of Adobe software skills and effects allowing them to develop ideas graphically to produce professional outcomes |
| **Pupils will know how to**<br>**(procedural knowledge)** | ● Know how to create an artboard in Photoshop<br>● Know how to place images into Photoshop files<br>● Know how to use tools such as eraser, paintbrush and fill<br>● Know how to apply special effects such as glows and overlays<br>● Know how to use filter gallery<br>● Know how to show and present the design process in Google Slides |
| **Core knowledge to know and remember to progress to later learning (foundational knowledge)** | ● Core understanding of how to sketch layout ideas inspired by a topic and use Adobe software to create final graphics and intentions<br>● Core understanding of presenting the design process in Google slides |
| **Prior knowledge** | The carousel system means that each student's prior knowledge will differ at different stages.<br><br>● Good experience of sketching 2D from Y7 and 8<br>● Good experience of using Google suite and documenting the design process. |
| **Future knowledge** | ● Preparation for graphics GCSE / Photography GCSE through creative research and planning resulting in original final |

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| | outcomes |
| **Key vocabulary** | Eraser - Paintbrush - Bucket - Overlay - Glow - Filters - Special Effects - Layers |

| **Topic Title** | **Wearable Fantasy** |
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| **Pupils will know** | • How to design |
| **Pupils will know how to (procedural knowledge)** | • Know how to mindmap and reflect on broader ideas<br>• Know how to create inspirational moodboards and image source<br>• Know how to generate creative ideas inspired by research<br>• Know how to create 2D CAD files for the lasercutter using 2D Design<br>• Know how to pewter cast<br>• Know how to show and present the design process in Google Slides |
| **Core knowledge to know and remember to progress to later learning (foundational knowledge)** | • Core understanding of the research process and its importance to idea generation<br>• Core understanding of the idea generation process using 'conceptual combination' and mixing and merging ideas to produce creative outcomes<br>• Core understanding of the uses of 2D Design to create CAD files for laser cutting<br>• Core understanding of the pewter casting process<br>• Core understanding of the use of Google Slides to present a clear design process including research, design ideas, development and outcomes |
| **Prior knowledge** | The carousel system means that each student's prior knowledge will differ at different stages.<br><br>• Basic awareness of tools/materials from KS2 (varies significantly).<br>• Some students may have minimal experience of making.<br>• Some students may have some experience of sketching and rendering ideas.<br>• Some students may have minimal experience of using Google Suite. |

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| **Future knowledge** | • Preparation for future workshop practical lessons<br>• Preparation for documenting the design process in Google Slides |
| **Key vocabulary** | **Tools**<br>2D Design - pewter casting machine - files - junior hacksaws - pillar drill - jigs<br>**H&S**<br>Aprons - Goggles - Guards - Clamping - casting wear -<br><br>**Materials**<br>Alloy - Pewter - MDF mould - accessories |

| **Topic Title** | **Kandinsky Clock** |
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| **Pupils will know** | • To know health & safety rules in a workshop.<br>• To be able to identify hand tools (coping saw, file, try square).<br>• To be able to identify machinery (pillar drill, belt sander)<br>• To safely use machinery in line with health and safety regulations.<br>• To gain knowledge of Wassily Kandinsky and analyse his work for inspiration<br>• Use inspiration from their research to create their own creative designs in the same style |
| **Pupils will know how to (procedural knowledge)** | • Know how to create inspirational research based on analysis of existing designer using descriptive wording<br>• Know how to generate creative well drawn ideas in the style of Kandinsky<br>• Know how to mark out work accurately using templates<br>• Know how to remove material accurately using a range of saws and drills<br>• Know how to finish material using sanders and sand paper<br>• Know how to show and present the design process in Google Slides in a creative way graphically |
| **Core knowledge to know and remember to progress to later learning (foundational knowledge)** | • Core understanding of safe workshop practices (hair up, aprons, no loose clothing, goggles, guards, clamping)<br>• Core understanding of how to use hand tools to manipulate and finish materials<br>• Core understanding of how to use machinery to manipulate and finish materials<br>• Core understanding of the use of Google Slides to present a clear design process including research, design ideas, diary of making, development and outcomes |
| **Prior knowledge** | The carousel system means that each student's prior knowledge will differ at different stages. |

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| | ● Good awareness of tools/materials from Y7 & 8<br>● Good awareness of making skills<br>● Good sketching and rendering skills<br>● Good experience of using Google Suite |
| **Future knowledge** | ● Preparation for future workshop practical lessons<br>● Preparation for documenting the design process in Google Slides |
| **Key vocabulary** | **Tools**<br>Template - Coping Saw - Belt Sander - Pillar Drill - Hole saw - files - sand paper - try square - glue gun<br><br>**H&S**<br>Aprons - Goggles - Guards - Clamping<br><br>**Materials**<br>MDF - Acrylic - Tracing paper<br><br>**Artist**<br>Abstract - Vibrant - Geometric - Unusual - Dynamic - Musical |