Design Technology-KS3

Design and Technology is an exciting, varied and rewarding subject that aims to develop creativity, designing and making skills using traditional and modern techniques, teamwork, perseverance, independence and problem solving. We aim to keep up with advances in science, engineering and technology so the projects are continually updated. Through a rotational Key Stage 3 curriculum, pupils enjoy the experience of a range of technology disciplines and support pupil's skills and development with exciting projects and a hands-on teaching approach.

Schemes of work: Product Design

Year 7

<table>
<tr><th colspan="2">Autumn</th><th colspan="2">Spring</th><th colspan="2">Summer</th></tr>
<tr><td colspan="2">Design Skills</td><td colspan="2">Blockbot Toy</td><td colspan="2">Jewellery box with pewter jewellery</td></tr>
<tr><td colspan="2">As part of the transition process the first term of Design and Technology in year 7 is taught in our Rowan building.
Pupils undertake a series of graphic based projects and small construction tasks to build design and fine motor skills.</td><td colspan="2">Pupils create a wooden robot shaped toy.
This project focuses on key basic skills such as health and safety, accurate and precise measuring, sequencing of stages in making a product and the use of specialist tools and machinery.</td><td colspan="2">Pupils to create a wooden Jewellery box using soft wood and using hand tools and workshop machinery. Pupils will design jewellery on 2D design software observe the casting process and file and finish jewellery aim at a target market.</td></tr>
<tr><td>Learning Objectives</td><td>Key Skills and Knowledge</td><td>Learning Objectives</td><td>Key Skills and Knowledge</td><td>Learning Objectives</td><td>Key Skills and Knowledge</td></tr>
<tr>
<td>Pupils will:
Investigate art and design movements.
Understand that our first idea is not always the best idea
Research existing products to identify and understand target markets.
Use colour theory to inform design decisions.
Develop and communicate design ideas.
Design a 2D image using Hama beads.</td>
<td>Understand the key characteristics and styles of art and design movements.
Follow instructions from drawn plans
Evaluate a range of existing products, how different products appeal to different users.
Generate, develop, communicate and model their ideas through talking, drawing, templates and, where appropriate, ICT.
Create own designs.
Make purposeful, functional and appealing products for a target market.
Select and use specialist tools, equipment and materials.</td>
<td>Pupils will:
Understand why health and safety is important in the design and technology classroom and workshop.
Research existing products to identify and understand target markets.
Develop and communicate design ideas.
Be able to measure accurately.
Understand how to create a cutting list to minimise wastage.
Sequence stages of making.
Use specialist tools and equipment safely and correctly
Hand tools
Belt Sander
Pillar Drill
Using a range of techniques to add a decorative finish.</td>
<td>Identify health and safety signs, and hazards and risks in the design and technology environment.
Identify tools and equipment.
Be able to use measurements such as millimetres, centimetres and metres, using rulers and measuring equipment.
Be able to understand stock measurements and a cut list.
Understand circumferences, diameters and radius, use a compass to create circles using measurements.
Evaluate a range of existing products, discussing target markets.
Generate, develop, communicate and model their ideas through talking, drawing, templates and, where appropriate, ICT.
Be able to plan the stages of making through sequencing, this is done first because… etc
Use a range of tools and equipment to make a finished product.</td>
<td>Pupils will:
Understand why health and safety is important in the design and technology classroom and workshop.
Research existing products to identify and understand target markets.
Develop and communicate design ideas.
Be able to measure accurately on CAD.
Sequence stages of making.
Use specialist tools and equipment safely and correctly
CAD
Laser cutter
Using a range of techniques to add a decorative finish.</td>
<td>Identify health and safety signs, and hazards and risks in the design and technology environment.
Identify tools and equipment.
Be able to use measurements such as millimetres, centimetres, and metres, using rulers and measuring equipment.
Be able to understand stock measurements and a cut list.
Understand circumferences, diameters, and radius, use a compass to create circles using measurements.
Evaluate a range of existing products, discussing target markets.
Generate, develop, communicate, and model their ideas through talking, drawing, templates and, where appropriate, ICT.
Be able to plan the stages of making through sequencing, this is done first because… etc
Use a range of tools and equipment to make a finished product.</td>
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			Use a range of techniques such as CAD/CAM to apply a design		Use a range of techniques such as CAD/CAM to apply a design

Year 8

Autumn		Spring		Summer	
Art Movement Passive speaker		**Pencil case/ keepsake box**		**Laminated pine box**	
Pupils create a passive speaker inspired by an art movement This project focuses on building electronic and soldering skills, building CAD/CAM skills, combining materials, sequencing of stages in making a product and the use of specialist tools and machinery.		Pupils create a wooden pencil case or wooden keepsake box. This project focuses on building on skills such as health and safety, CAD/CAM, accurate and precise measuring, sequencing of stages in making a product and the use of specialist tools and machinery.		Pupils will create a Laminated pine box focusing on understanding grain and texture of softwood and its applications.	
Learning Objectives	**Key Skills and Knowledge**	**Learning objectives**	**Key skills and Knowledge**	**Learning Objectives**	**Key Skills and Knowledge**

Pupils will:
• Understand why health and safety is important in the design and technology classroom and workshop.
• Research the key features of a range of Art and Design movements.
• Demonstrate how to solder safely and effectively.
• Demonstrate how to populate a PCB with the correct components.
• Research existing products to identify and understand target markets.
• Develop and communicate design ideas.
• Sequence stages of making.
• Select and use specialist tools and equipment safely and correctly.
• Be able to measure accurately on CAD.
• Sequence stages of making.
• Use specialist tools and equipment safely and correctly
  ○ CAD
  ○ Laser cutter
  ○ Line Bender
• Using a range of techniques to add a decorative finish.
	• Identify health and safety signs, and mitigate hazards and risks in the design and technology environment.
	• Identify and select tools and equipment.
	• Know the difference between a series and parallel circuit.
	• Be able to identify and describe components and draw a simple circuit diagram.
	• Demonstrate how to solder including tinning the tip and creating an electrical joint.
	• Be able to identify soldering equipment and understand the health and safety risks.
	• Be able to troubleshoot and problem solve a soldered circuit.
	• Be able to adapt a PCB and wiring to fit their chosen design.
	• Evaluate a range of existing products, discussing target markets.
	• Generate, develop, communicate and model their ideas through talking, drawing, templates and, where appropriate, ICT.
		Pupils will:
		• Identify risks and hazards when working with specialist tools and machinery.
		• Research existing products to identify and understand target markets.
		• Develop and communicate design ideas.
		• Be able to work to scale and measurements in CAD.
		• Sequence stages of making.
		• Use specialist tools and equipment safely and correctly
		  • Hand tools
		  • Belt Sander
		  • Scroll Saw
		  • Pillar Drill
		  • Laser cutter
		• Using a range of techniques to add a decorative finish.
			• Identify health and safety signs, and mitigate hazards and risks in the design and technology environment.
			• Identify and select tools and equipment.
			• Evaluate a range of existing products, discussing target markets.
			• Generate, develop, communicate and model their ideas through talking, drawing, templates and, where appropriate, ICT.
			• Be able to work to a cutting list and understand wastage.
			• Be able to use measurements such as millimetres, centimetres and metres, using CAD, rulers and measuring equipment.
			• Be able to understand stock measurements and a cut list.
			• Understand circumferences, diameters and radius, and how to place and cut into material with appropriate equipment.
			• Be able to plan the stages of making through sequencing, this is done first because… etc
			• Use a range of tools and equipment to make a finished product.
			• Make a purposeful, functional and appealing product for a target market.
				Pupils will:
				• Understand why health and safety is important in the design and technology classroom and workshop.
				• Research existing products to identify and understand target markets.
				• Develop and communicate design ideas.
				• Be able to measure accurately.
				• Understand how to create a cutting list to minimise wastage.
				• Sequence stages of making.
				• Use specialist tools and equipment safely and correctly
				  ○ Hand tools
				  ○ Belt Sander
				  ○ Pillar Drill
				• Using a range of techniques to add a decorative finish.
					• Identify health and safety signs, and hazards and risks in the design and technology environment.
					• Identify tools and equipment.
					• Be able to use measurements such as millimetres, centimetres and metres, using rulers and measuring equipment.
					• Be able to understand stock measurements and a cut list.
					• Understand circumferences, diameters and radius, use a compass to create circles using measurements.
					• Evaluate a range of existing products, discussing target markets.
					• Generate, develop, communicate and model their ideas through talking, drawing, templates and, where appropriate, ICT.
					• Be able to plan the stages of making through sequencing, this is done first because… etc
					• Use a range of tools and equipment to make a finished product.
					Use a range of techniques such as CAD/CAM to apply a design

	• Be able to plan the stages of making through sequencing, this is done first because… etc • Make purposeful, functional and appealing products for a target market. • Be able to use measurements such as millimetres, centimetres using CAD. • Understand circumferences, diameters and radius, using CAD. • Be able to minimise wastage when using CAM. • Be able to plan the stages of making through sequencing, this is done first because… etc • Use a range of tools and equipment to make a finished product. • Use a range of techniques such as CAD/CAM to apply and manufacture a design. Understand how this product can be a One off, batch or mass production.				

Year 9

Autumn		Spring		Summer	
Art Movement inspired Desk Lamp		Phone/Device Stand		Bird Box	
Pupils create a decorative desk lamp inspired by an art movement This project focuses on building electronic and soldering skills, building CAD/CAM skills, combining materials, sequencing of stages in making a product and the use of specialist tools and machinery.		Pupils create a phone/device stand. This project focuses on building on skills such as health and safety, accurate and precise measuring, sequencing of stages in making a product and the use of specialist tools and machinery.		Pupils create a decorative tea light holder. This project focuses on building the skills of CAD/CAM and their use of specialist tools and equipment.	
Learning Objectives	**Key Skills and Knowledge**	**Learning Objectives**	**Key skills and Knowledge**	**Learning Objectives**	**Key Skills and Knowledge**

Pupils will:
• Understand why health and safety is important in the design and technology classroom and workshop.
• Research the key features of a range of Art and Design movements.
• Demonstrate how to solder safely and effectively.
• Demonstrate how to populate a PCB with the correct components.
• Research existing products to identify and understand target markets.
	• Identify health and safety signs, and mitigate hazards and risks in the design and technology environment.
	• Identify and select tools and equipment.
	• Know the difference between a series and parallel circuit.
	• Be able to identify and describe components and draw a simple circuit diagram.
	• Demonstrate how to solder including tinning the tip and creating an electrical joint.
		Pupils will:
		• Understand why health and safety is important in the design and technology classroom and workshop.
		• Research existing products to identify and understand target markets.
		• Develop and communicate design ideas.
		• Be able to measure accurately on CAD.
		• Sequence stages of making.
		• Use specialist tools and equipment safely and correctly
		  ○ CAD
		  ○ Laser cutter
			• Identify health and safety signs, and mitigate hazards and risks in the design and technology environment.
			• Identify and select tools and equipment.
			• Evaluate a range of existing products, discussing target markets.
			• Generate, develop, communicate and model their ideas through talking, drawing, templates and, where appropriate, ICT.
				Pupils will:
				• Identify risks and hazards when working with specialist tools and machinery.
				• Research existing products to identify and understand target markets.
				• Develop and communicate design ideas.
				• Be able to work to scale and measurements in CAD.
				• Sequence stages of making.
				• Use specialist tools and equipment safely and correctly
				  ○ Hand tools
				  ○ Belt Sander
				  ○ Scroll Saw
					• Identify health and safety signs, and mitigate hazards and risks in the design and technology environment.
					• Identify and select tools and equipment.
					• Evaluate a range of existing products, discussing target markets.
					• Generate, develop, communicate and model their ideas through talking, drawing, templates and, where appropriate, ICT.
					• Be able to work to a cutting list and understand wastage.

• Develop and communicate design ideas.
• Sequence stages of making.
• Select and use specialist tools and equipment safely and correctly.
• Be able to measure accurately on CAD.
• Sequence stages of making.
• Use specialist tools and equipment safely and correctly
  ○ CAD
  ○ Laser cutter
  ○ Line Bender
• Using a range of techniques to add a decorative finish.
	• Be able to identify soldering equipment and understand the health and safety risks.
	• Be able to troubleshoot and problem solve a soldered circuit.
	• Be able to adapt a PCB and wiring to fit their chosen design.
	• Evaluate a range of existing products, discussing target markets.
	• Generate, develop, communicate and model their ideas through talking, drawing, templates and, where appropriate, ICT.
	• Be able to plan the stages of making through sequencing, this is done first because… etc
	• Make purposeful, functional and appealing products for a target market.
	• Be able to use measurements such as millimetres, centimetres using CAD.
	• Understand circumferences, diameters and radius, using CAD.
	• Be able to minimise wastage when using CAM.
	• Be able to plan the stages of making through sequencing, this is done first because… etc
	• Use a range of tools and equipment to make a finished product.
	• Use a range of techniques such as CAD/CAM to apply and manufacture a design.
	Understand how this product can be a One off, batch or mass production.
		○ Line Bender
		• Using a range of techniques to add a decorative finish.
			• Be able to use measurements such as millimetres, centimetres using CAD.
			• Understand circumferences, diameters and radius, using CAD.
			• Be able to minimise wastage when using CAM.
			• Be able to plan the stages of making through sequencing, this is done first because… etc
			• Use a range of tools and equipment to make a finished product.
				○ Pillar Drill
				• Using a range of techniques to add a decorative finish.
					• Be able to use measurements such as millimetres, centimetres and metres, using rulers and measuring equipment.
					• Be able to understand stock measurements and a cut list.
					• Understand circumferences, diameters and radius, and how to place and cut into material with appropriate equipment.
					• Be able to plan the stages of making through sequencing, this is done first because… etc
					• Use a range of tools and equipment to make a finished product.
					• Make a purposeful, functional and appealing product for a target market.