

Rayner Stephens
HIGH SCHOOL

Curriculum
Intent
for
Design Technology

Design Technology is about viewing the world around us. To look at where we are now in the 21st century, and where we could be in the future. To know about past and present designers, inventors and innovators and aspire to become people that design and shape the world. In an increasingly technological society we aim to encourage students to think independently and be creatively when working on a problem. We intend to teach students to be problem solvers in a safe learning environment and explain that making mistakes is okay, and part of the development of process. To build upon theory using research and ideas across all subjects and then apply it to solve real world issues. Design Technology is an inspiring practical subject using a broad range of subject knowledge such as mathematics, science, engineering, computing, food science and art. High-quality We aim to empower students to become the people who will solve the issue of tomorrows world. For example, climate change and the quality of life. Design Technology education makes an essential contribution to the creativity, culture, wealth and well-being of the human race and how we can help the world around us.

Final GCSE Exam

Core content and specialist knowledge:
Revise and practice exam papers in preparation for your final exam in DT.

EXAM REVISION

AO3: Evaluate and Test
Gain feedback throughout your project and test your final product. Have you met your specification?

AO2: Realise Design ideas:
Manufacture your product using skills and processes used throughout your DT journey.

AO2: Develop Design Ideas
Develop your sketches and communicate ideas. Using modelling techniques.

AO2: Generate Design Ideas
Develop your sketches and communicate ideas. Develop them using various design techniques.

Y11

AO1: Specification and Brief
Clarify the needs and wants of the project writing your own brief and design specification.



Materials:
What materials will be appropriate for your product? What materials are sustainable?



Product research/analysis



Design:

Make:
Addition processes and wood joints. Using skills to develop high quality craftsmanship products.

Testing:
Use various testing and modelling methods to develop your product.



Evaluate:
What skills have you developed? Test your product and consider how you would improve it.

Y10

Apply Sustainability 6 R's knowledge

GCSE NEA CONTEXTS

AO1: Investigate the design possibilities:
What is the design context? What research can you carry out to gather ideas?

Evaluate:
What skills have you developed? Test your product and consider how you would improve it.

Design: CAD
What is computer aided design? Learn to use the basics of Photoshop to design products.

Evaluate:
What skills have you developed? Test your product and consider how you would improve it.

Make:
Develop your design through iterative processes and modelling, testing & evaluating before making a final product.



Design:



Pewter Casting Project



Materials research

Recall Sustainability 6 R's



Recall Health and Safety



Recall: CAD
What is computer aided design? Are you able to use the basics of 2D software to design products.

Design: CAD
What is computer aided design? Learn to use the basics of 3D software to design products.

Modelling:
Will my product work? What can I do to improve it?



Make:
Can you make an accurate product using machines and tools independently?

Evaluate:
What skills have you developed? Test your product and consider how you would improve it.



Baseline Assessment

Y9

Recall Sustainability 6 R's

Evaluate:
What makes a good drawing? How can you improve your skills?

Evaluate:
At each stage of making, how can you improve your product? Would you change any thing?



Make



Design



Bottle Balance Project



Materials research



Recall Health and Safety



Baseline Assessment

Isometric Drawing

Research Sustainability 6 R's



Introduction to CAD
What is computer aided design? Learn to use the basics of 2D software to design products.

Design: CAD
What is computer aided design? Learn to use the basics of 2D software to design products.



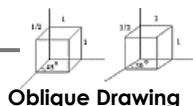
Make:
What is CAM? Use the laser cutter to produce your final product.

Evaluate:
How has CAD / CAM helped you to make a product?

Evaluate:
What makes a good drawing? How can you improve your skills?



Evaluate:
Does your product work? How can you fix problems?



Oblique Drawing



Mechanisms:
Motions, gears, levers, pulleys, etc.

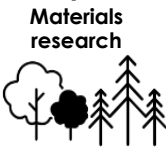
Y8

Introduction to Sustainability 6 R's

Materials:
Working with MDF, cutting and finishing techniques.



Design



Materials research



Introduction to the workshop:
Health and Safety



Baseline Assessment:
What do you already know about DT?

Y7

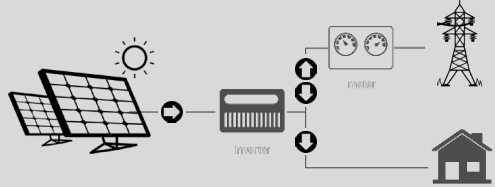
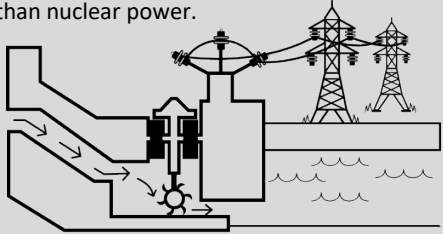
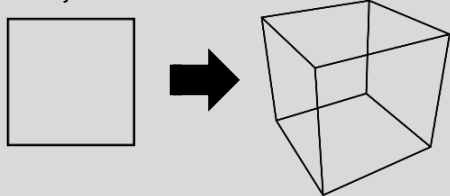
A wide range of fun and exciting mini projects that teach you valuable skills in the workshop. Understanding different materials and how they work.

Year 9 – Design Technology Rotation

Curriculum intent	The aim of the Design Technology curriculum is to ensure that all students have the confidence and ability to work in a practical environment. Design Technology is about problem solving and not about getting things right the first time. It is all about the process and application of skills learnt. To apply all the design, development, making and evaluating skills learnt and understand that these can be applied through life. To demonstrate critical thinking skills and solve problems creatively. To develop and evaluate new ideas until a functional solution has been made. To design, evaluate, make and apply technical knowledge and consider client needs.					
Term	Autumn 1 (HT1)	Autumn 2 (HT2)	Spring 1 (HT3)	Spring 2 (HT4)	Summer 1 (HT5)	Summer 2 (HT6)
Knowledge	<p><u>Pewter Casting</u> Pewter is an ideal metal for Year 9 casting projects, the modern alloy is lead free and is cast at a low enough temperature to allow casting into a variety of simple mould materials. Learners will need to learn further finishing process and the product can be polished to a bright silver like finish or satin or textured finishes can produce an item with a quality appearance.</p> <p><u>Perspective Drawings</u> Learning how to draw perspective is a valuable skill as it is a simple type of technical drawing of graphical projection used for producing three-dimensional (3D) images of objects.</p>	<p><u>CAD -CAM</u> Computer-aided design is the use of computers to aid in the creation, modification of a design. Learners will learn to use Photoshop to increase the productivity of their design ideas, improve the quality and accuracy of products, to create a database for manufacturing. CAD output is in the form of electronic files for printing.</p> <p><u>Sustainability</u> Making products and considering their impact on the natural world.</p>	<p><u>Pewter Casting</u> Pewter is an ideal metal for Year 9 casting projects, the modern alloy is lead free and is cast at a low enough temperature to allow casting into a variety of simple mould materials. Learners will need to learn further finishing process and the product can be polished to a bright silver like finish or satin or textured finishes can produce an item with a quality appearance.</p> <p><u>Perspective Drawings</u> Learning how to draw perspective is a valuable skill as it is a simple type of technical drawing of graphical projection used for producing three-dimensional (3D) images of objects.</p>	<p><u>CAD -CAM</u> Computer-aided design is the use of computers to aid in the creation, modification of a design. Learners will learn to use Photoshop to increase the productivity of their design ideas, improve the quality and accuracy of products, to create a database for manufacturing. CAD output is in the form of electronic files for printing.</p> <p><u>Sustainability</u> Making products and considering their impact on the natural world.</p>	<p><u>Pewter Casting</u> Pewter is an ideal metal for Year 9 casting projects, the modern alloy is lead free and is cast at a low enough temperature to allow casting into a variety of simple mould materials. Learners will need to learn further finishing process and the product can be polished to a bright silver like finish or satin or textured finishes can produce an item with a quality appearance.</p> <p><u>Perspective Drawings</u> Learning how to draw perspective is a valuable skill as it is a simple type of technical drawing of graphical projection used for producing three-dimensional (3D) images of objects.</p>	<p><u>CAD -CAM</u> Computer-aided design is the use of computers to aid in the creation, modification of a design. Learners will learn to use Photoshop to increase the productivity of their design ideas, improve the quality and accuracy of products, to create a database for manufacturing. CAD output is in the form of electronic files for printing.</p> <p><u>Sustainability</u> Making products and considering their impact on the natural world.</p>
Skills	<ul style="list-style-type: none"> • Health and safety • Graphics based covering sketching in 2D and 3D • Technical vocabulary, mathematical terms and measurement • Modelling in cardboard to 	<ul style="list-style-type: none"> • Computer-aided design • Computer-aided manufacture • Identifying modification • Plane Project • The 6 R's • Precious plastics 	<ul style="list-style-type: none"> • Health and safety • Graphics based covering sketching in 2D and 3D • Technical vocabulary, mathematical terms and measurement • Modelling in cardboard to 	<ul style="list-style-type: none"> • Computer-aided design • Computer-aided manufacture • Identifying modification • Plane Project • The 6 R's • Precious plastics 	<ul style="list-style-type: none"> • Health and safety • Graphics based covering sketching in 2D and 3D • Technical vocabulary, mathematical terms and measurement • Modelling in cardboard to 	<ul style="list-style-type: none"> • Computer-aided design • Computer-aided manufacture • Identifying modification • Plane Project • The 6 R's • Precious plastics

	<p>produce scale prototypes</p> <ul style="list-style-type: none"> Quality outcomes produced using workshop skill and equipment Packaging design 	<ul style="list-style-type: none"> Sustainable Timber The morals of sustainability Practical 	<p>produce scale prototypes</p> <ul style="list-style-type: none"> Quality outcomes produced using workshop skill and equipment Packaging design 	<ul style="list-style-type: none"> Sustainable Timber The morals of sustainability Practical 	<p>produce scale prototypes</p> <ul style="list-style-type: none"> Quality outcomes produced using workshop skill and equipment Packaging design 	<ul style="list-style-type: none"> Sustainable Timber The morals of sustainability Practical
Assessments	<p>Progress Test, including extended written answer. Oblique, Isometric and perspective drawings. Practical outcome - model and working prototype.</p>	<p>Quality control check against design specification and evaluation. Sustainability test, with high value question.</p>	<p>Progress Test, including extended written answer. Oblique, Isometric and perspective drawings. Practical outcome - model and working prototype.</p>	<p>Quality control check against design specification and evaluation. Sustainability test, with high value question.</p>	<p>Progress Test, including extended written answer. Oblique, Isometric and perspective drawings. Practical outcome - model and working prototype.</p>	<p>Quality control check against design specification and evaluation. Sustainability test, with high value question.</p>
Enrichment	<p>https://technologystudent.com/prddes_2/jewellery1.html</p>	<p>https://classroom.thenational.academy/lessons/can-nature-make-us-more-environmentally-accountable-6wu66t</p>	<p>https://technologystudent.com/prddes_2/jewellery1.html</p>	<p>https://classroom.thenational.academy/lessons/can-nature-make-us-more-environmentally-accountable-6wu66t</p>	<p>https://technologystudent.com/prddes_2/jewellery1.html</p>	<p>https://classroom.thenational.academy/lessons/can-nature-make-us-more-environmentally-accountable-6wu66t</p>

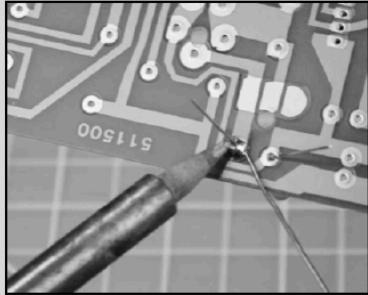
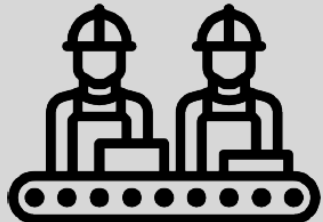
Year 9 Design and Technology Autumn Term Knowledge Organiser

Key Vocabulary:			Bottle Balance		3D Design		
1	CAD	Computer-aided design is the use of computers to aid in the creation, modification, analysis, or optimization of a design. This software is used to increase the productivity of the designer, improve the quality of design, improve communications through documentation, and to create a database for manufacturing.	7	Natural	Existing in or derived from nature; not made or caused by humankind. For example, gold is naturally occurring but a gold bar or gold ring is man-made.	13	<p>Solar Panel - What is it?</p> <p>A solar cell panel, solar electric panel, photo-voltaic module or solar panel is an assembly of photo-voltaic cells mounted in a framework for installation. Solar panels use sunlight as a source of energy to generate direct current electricity.</p> 
2	CAM	Computer Aided Manufacturing is the use of software and computer-controlled machinery to automate a manufacturing process.	8	Environment	The natural environment or natural world encompasses all living and non-living things occurring naturally, meaning in this case not artificial. The term is most often applied to the Earth or some parts of Earth.	14	<p>Hydroelectric - What is it?</p> <p>Hydroelectricity, or hydroelectric power, is electricity produced from hydropower. In 2020 hydropower generated one sixth of the world's electricity, almost 4500 TWh, which was more than all other renewables combined and also more than nuclear power.</p> 
3	Automation	Automation describes a wide range of technologies that reduce human intervention in processes.	9	Sustainability	A societal goal with three dimensions: the environmental, economic and social dimension. Environmental sustainability occurs when natural resources are preserved.	15	<p>Oblique Projection</p> <p>It is a simple type of technical drawing of graphical projection used for producing three-dimensional (3D) images of objects.</p> 
4	Crowd Funding	A scale model is a physical model which is geometrically similar to an object (known as the prototype). Scale models are generally smaller than large prototypes such as vehicles, buildings. Models built to the same scale as the prototype are called mock-ups.	10	Renewable Energy	Renewable energy is energy that is collected from renewable resources that are naturally replenished on a human timescale. It includes sources such as sunlight, wind, rain, tides, waves, and geothermal heat.	16	<p>Evaluation</p> <p>Designers evaluate their finished products to test whether they work well and if design can be corrected or improved. It is important to evaluate your work constantly during the project to see if it is on track and so that improvements can be built-in throughout the design process, not just at the end.</p>
5	Virtual Marketing	Viral marketing or viral advertising is a business strategy that uses existing social networks to promote a product mainly on various social media platforms.	11	Fossil Fuels	A fossil fuel is a hydrocarbon-containing material formed naturally in the earth's crust from the remains of dead plants and animals that is extracted and burned as a fuel. The main fossil fuels are coal, crude oil and natural gas.		
6	Planned Obsolescence	In economics and industrial design, planned obsolescence is a policy of planning or designing a product with an artificially limited useful life or a purposely frail design, so that it becomes obsolete after a certain pre-determined period of time .	12	Nuclear Power	the use of nuclear reactions to produce electricity. Nuclear power can be obtained from nuclear fission, nuclear decay and nuclear fusion reactions. Presently, the vast majority of electricity from nuclear power is produced by nuclear fission of uranium and plutonium in nuclear power plants.		

Year 9 Design and Technology Summer Term Knowledge Organiser

Key Vocabulary:		
1	LED	It converts electrical energy into light – output.
2	Toggle switch	Allows current to flow only when the switch is pressed – input.
3	Speaker	It converts electrical energy into sound – output.
4	Motor	It converts electrical energy to kinetic energy (motion) – output.
5	Buzzer	A design brief is a document for a design project developed by a person or team in consultation with the client/customer. They outline the deliverables and scope of the project; function and aesthetics, timing, budget, etc – output.
6	LDR	It converts brightness (light) to resistance (an electrical property) – output.
7	Design Brief	A design brief is a document for a design project developed by a person or team in consultation with the client/customer. They outline the deliverables and scope of the project; function and aesthetics, timing, budget, etc.
8	Specification	It is a list of criteria that the product needs to meet if it is to be successful.
9	Man-Made Boards	Manufactured boards are timber sheets which are produced by gluing wood layers or wood fibres together. Manufactured boards often made use of waste wood materials. Manufactured boards have been developed mainly for industrial production.

Sustainable Desk Lamp		
8	Microcontrollers	Microcontrollers are quickly replacing computers when it comes to programming robotic devices. These microcontrollers are small single board computers (SBC) that can be programmed to carry out a number of tasks and are ideal for school and industrial projects. A simple program is written using a computer, it is then downloaded to a microcontroller which in turn can control a robotic device.
9	Advantages of using a microcontroller:	They allow greater flexibility because they can be reprogrammed to change its function and how it works. The size of a circuit can be reduced because one microcontroller can replace several other interface controllers. It has the ability to store information.
10	Disadvantages of using a microcontroller:	They often cost more than traditional integrated circuits. They are therefore not always the best option for simple systems. Programming software and hardware is required which can be expensive to buy. The language of the system (coding) must be learned and this adds to training costs.
11	Products that use a microcontroller:	<ul style="list-style-type: none"> • Alarms • Computers • Smartphones • Washing machines • Remote controls • Microwaves • Vending machines • Cars

Electronics	
15	<p>Soldering</p> <p>Soldering in electronics is a method of joining components permanently to a printed circuit board (PCB). An alloy of tin and lead called solder (63% tin and 37% lead), is normally used to ‘metallurgically’ bind a component pin/leg to the copper track of a circuit.</p> 
16	<p>Manufacture - What is it?</p> <p>Soldering requires a lot of practice as it is easy to ‘destroy’ many hours preparation and design work by poor soldering. When soldering, the ideal finish to the soldered joint, is a concave fillet (volcano shape). This can only be achieved if the soldering iron is at the right temperature, it has been in contact with both the copper track and component pin/leg for the right length of time.</p> 
16	<p>Evaluation</p> <p>Designers evaluate their finished products to test whether they work well and if design can be corrected or improved. It is important to evaluate your work constantly during the project to see if it is on track and so that improvements can be built-in throughout the design process, not just at the end.</p>