Bishop Stopford School

faith | justice | responsibility | truth | compassion

Design & Technology

Curriculum – Key Stage 4

Key Stage 4 Curriculum Overview 2025-26

		Materials & Their Working Properties	Energy, Systems & Devices	New & Emerging Technologies
		7 Sessions (14 weeks)	4 Sessions (8 weeks)	4 Sessions (8 weeks)
Year 10 Theory	Unit description	Each of the following learning outcomes apply five key material areas: 1. Papers and boards 2. Natural and manufactured timbers 3. Metals and alloys 4. Polymers 5. Textiles At the end of this Unit all students should be able to: Know the primary sources of materials for producing a variety of materials in each of five key material areas Be able to recognise and characterise different types of materials in each key area Most students will be able to: Understand how the physical and working properties of a material products affect their performance Some students will be able to: Consistently select the most appropriate material appropriate to a given task Tier 3 technical language will be focussed on throughout the work and students will be encouraged to identify this language within their notes.	Explain how power is generated from oil, gas, coal and nuclear sources Explain how renewable energy is generated from a variety of sources Describe kinetic pumped storage systems Name and define a range of modern, smart and composite materials Understand the unique properties of technical textiles Describe the benefits of microencapsulation Recognise and describe a range of input and output components, physically and symbolically Understand that all systems comprise of one or more inputs, processes and outputs Recognise different types of mechanical movement State examples of first, second and third order levers Understand how linkages change the direction of movement Recognise different types of cams and followers Understand that pulleys can change the magnitude of force required to lift mass Argue for and against the selection of fossil fuels or nuclear power Argue for and against the selection of renewable energy Explain the difference between alkaline and rechargeable batteries Justify where the use of a technical textile might be suitable Suggest a suitable input or output device for a given scenario Suggest a suitable linkage for a given scenario Understand how the action of forces, levers and gears transmit and transform the effects of forces Justify the use of a range of modern, smart and composite materials for given situations Suggest an appropriate movement and mechanism to use in a given scenario to perform a specific task Demonstrate an understanding of how microcontrollers are programmed to control processes in simple systems Tier 3 technical language will be focussed on throughout the work and students will be encouraged to identify this language within their notes.	Explain the impact of new and emerging technologies on tools and equipment Explain how robotics have affected the workplace Describe co-operative and fair trade organisations Understand that new technologies need to be developed and produced in a sustainable way Be aware of the impact that excessive use of certain resources has on the environment Understand how technology push and market pull affect consumer choice and employment Describe how changes in fashion and trends affect designers and manufacturers Understand contemporary and potential future use of automation, Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM) Understand how products can be designed to be repaired and recycled Demonstrate how computers and automation have changed manufacturing through the use of robotics Explain how the design of the workplace has been affected by changes in technology Describe how workplace layout affects throughput Understand how the environment can be protected by responsible design and manufacturing Understand how waste can be disposed of with the least impact on the planet Understand the positive and negative impacts new products have on the environment Identify changes in job roles due to the emergence of new ways of working Be aware of ethical and environmental concerns when designing with new technologies Demonstrate how innovation can drive product development and enterprise including the use of crowd funding and virtual marketing Understand how new products can have both a positive and negative impact on society Be able to recognise and characterise the use of Flexible Manufacturing Systems (FMS) Understand how Just In Time (JIT) and Lean Manufacturing contribute to manufacturing efficiencies Be able to evaluate the advantages and disadvantages of planned obsolescence from different perspectives Tier 3 technical language will be focussed on throughout the work and students will be encouraged to identify this language within their notes.
	Assessment	Formative Assessment – All notes are read, and comments made if additions are needed or misconceptions are noted Summative Assessment – Homework tasks are scored, End of Unit Test Standardised Exam Style homework	Formative Assessment – All notes are read, and comments made if additions are needed or misconceptions are noted Summative Assessment – Homework tasks are scored, End of Unit Test Standardised Exam Style homework	Formative Assessment – All notes are read, and comments made if additions are needed or misconceptions are noted Summative Assessment – Homework tasks are scored, End of Unit Test Standardised Exam Style homework
	Adaptive	Students are required to make their own notes. The detail and expectations will follow student ability. A differentiated sheet is available that includes pre-completed examples to reduce the cognitive load during lessons.	Students are required to make their own notes. The detail and expectations will follow student ability. A differentiated sheet is available that includes pre-completed examples to reduce the cognitive load during lessons.	S Students are required to make their own notes. The detail and expectations will follow student ability. A differentiated sheet is available that includes pre-completed examples to reduce the cognitive load during lessons.

Assessment types

🟦 Formative Assessment

🟥 Summative Assessment – Written feedback provided

🟨 Homework – Teacher assessed

Design & Technology

Curriculum – Key Stage 4

		Design Ventura	Mock NEA	NEA
		Approximately 8 weeks *"Intent – This project is designed to allow students to experience the freedom and self determination they will have during their NEA. A broad and deliberately vague starting point allows for a wide range of possible outcomes to be explored and practical outcomes will be very different".*	Approximately 8 weeks *"Intent – This project is designed to give students a final chance to receive written feedback on project based work. During the NEA they will not have this option. This project follows the NEA structure and will prepare students for the upcoming unit".*	Approximately 8 weeks
Year 10 Projects	Unit description	Knowledge The Design Process Research and the work of others Designing Evaluating Skills Prototyping *Students will be provided with access to:* Pillar Drill Belt Sander Scroll Saw Tenon Saw Coping Saw Laser Cutter 3D Printer Adhesives Surface Finishes (other processes will be made available to students as and when they are required)	Knowledge Students will follow the NEA structure as they learn what each section is for and how to complete it. These sections will include: • Research • Brief & Specification • Designing • Development • Manufacturing • Evaluating Skills Prototyping *Students will be provided with access to:* Pillar Drill Belt Sander Scroll Saw Tenon Saw Coping Saw Laser Cutter 3D Printer Adhesives Surface Finishes (other processes will be made available to students as and when they are required)	Knowledge Research: Brainstorm Problem Identification Existing Products Design Styles User Profile Brief & Specification Skills Researching Students will be provided with three possible starting points as supplied by the exam board. They must select one and then proceed with the rest of their project, focussing on their chosen starting point.
	Assessment	Formative Assessment – Detailed written feedback will be provided for all students to respond to Summative Assessment – A final end of project grade will be issued and compared to the students' targets Homework – Research and client interaction will form the basis of project homework	Formative Assessment – Detailed written feedback will be provided for all students to respond to Summative Assessment – A final end of project grade will be issued and compared to the students' targets Homework – Research and client interaction will form the basis of project homework	Formative Assessment – Students will receive a colour coded feedback sheet but no written feedback due to NEA rules Summative Assessment – A 'working grade' will be indicated on feedback sheets Homework – Research and client interaction will form the basis of project homework
	Adaptive	The complexity of the outcome and the fact that students are not producing the same item as their peers, all combine to produce an extremely challenging project. The use of language in feedback sheets will vary to ensure students can fully comprehend what is being asked of them.	The complexity of the outcome and the fact that students are not producing the same item as their peers, all combine to produce an extremely challenging project. The use of language in feedback sheets will vary to ensure students can fully comprehend what is being asked of them.	The very nature of this project is challenging. Checklists, guidance documents/videos and exemplars are made available. Templates are available for those students struggling the most although these adversely affect a student's mark due to NEA rules. Consolidation time will be made available to all students.

Assessment types

🟦 Formative Assessment
🟥 Summative Assessment – Written feedback provided
🟨 Homework – Teacher assessed

Key Stage 4 Curriculum Overview 2025-26

		NEA	NEA	NEA	NEA	Theory
		Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 4
Year 11	Unit description	Knowledge Design & Development Skills Designing Drawing Techniques Planning	Knowledge The development process Skills Prototyping *Students will be provided with access to:* Pillar Drill Belt Sander Scroll Saw Tenon Saw Coping Saw Laser Cutter 3D Printer Adhesives Surface Finishes (other processes will be made available to students as and when they are required)	Knowledge The Prototyping process Skills Prototyping *Students will be provided with access to:* Pillar Drill Belt Sander Scroll Saw Tenon Saw Coping Saw Laser Cutter 3D Printer Adhesives Surface Finishes (other processes will be made available to students as and when they are required)	Knowledge Evaluating Skills Testing Evaluating Modifying	Name and describe each of the different forces and stresses Recognise how materials have been stiffened or reinforced Give examples of the use of bending, lamination, folding, webbing and interfacing Define an ecological and social footprint Understand how deforestation, mining, drilling and farming affect our ecology Understand that carbon dioxide is produced during the manufacture of products and its influence on global warming Explain each of the six Rs Explain how safe working conditions and pollution impact on others Explain how products are produced in each of the four main scales of production Understand the impact of forces and stresses on different materials and objects Explain how a material may be reinforced or stiffened using a range of techniques Explain how bending, lamination, folding, webbing and interfacing affects the strength of a material Describe the ecological and social footprint left by designers Describe the effects of deforestation, mining, drilling and farming on the ecological footprint of a manufactured product Summarise the product mileage accumulated during the sourcing of raw materials, manufacture, distribution, user location and final disposal of a given product Describe how each of the six Rs can be applied to a given product Explain the ethical and the social footprint of materials used in products, and how the footprint may be reduced at the design stage Suggest appropriate scales of production related to specific materials and components and manufacturing techniques Describe the relationship between production volumes and methods and explain the factors involved in selecting an appropriate manufacturing method Explain the effects of a change in magnitude and direction of a force on a specific material or object Describe the specific techniques used to strengthen products made from differing materials Explain how designers can influence and minimise the need for deforestation, mining, drilling and farming, and their effects on carbon emissions Tier 3 technical language will be focussed on throughout the work and students will be encouraged to identify this language within their notes.
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	Adaptive	The very nature of this project is challenging. Checklists, guidance documents/videos and exemplars are made available. Templates are available for those students struggling the most although these adversely affect a student's mark due to NEA rules.	The very nature of this project is challenging. Checklists, guidance documents/videos and exemplars are made available. Templates are available for those students struggling the most although these adversely affect a student's mark due to NEA rules.	The very nature of this project is challenging. Checklists, guidance documents/videos and exemplars are made available. Templates are available for those students struggling the most although these adversely affect a student's mark due to NEA rules.	The very nature of this project is challenging. Checklists, guidance documents/videos and exemplars are made available. Templates are available for those students struggling the most although these adversely affect a student's mark due to NEA rules.	Students are required to make their own notes. The detail and expectations will follow student ability. A differentiated sheet is available that includes pre-completed examples to reduce the cognitive load during lessons.

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>Something More?

Curriculums at BSS are designed to nurture not only intellectual and physical development but also the spiritual growth of students. This will be through:

Encouraging students to reflect on their experiences, beliefs and purpose and to contemplate the big Questions of Who am I? Why am I here? What is my purpose?

Highlighting extraordinary people, events, and discoveries that inspire awe or investigating how a sense of awe has led to breakthroughs and creativity.

Using art, music, literature, and nature to inspire awe, wonder, and spiritual insight.

Encouraging creative expression to connect with the inner self and the transcendent.

Fostering a sense of belonging and interconnectedness with others, nature, and the universe.

Encouraging self-awareness, emotional intelligence, and moral reasoning.

Promoting open-ended investigations rather than just seeking right answers.

Using hands-on activities, field trips and experiments to immerse students in learning and evoke wonder.

How does our curriculum do >Something More?

KS4 Design & Technology

- Highlighting extraordinary people, events, and discoveries that inspire awe or investigating how a sense of awe has led to breakthroughs and creativity:
  - ✓ **Product Analysis: In our KS4 D&T curriculum, we highlight extraordinary people, events, and discoveries by analysing a range of existing products. Pupils explore how these products are designed and made, uncovering the creativity, problem-solving, and ingenuity behind them, benefiting society and improving lives.**

  - ✓ **Design Theory: Students explore a diverse range of influential designers to gain inspiration for their own work. By examining both modern inventions in materials and technological advancements, they come to appreciate how creativity, curiosity, and a sense of awe have driven progress and innovation.**

- Encouraging creative expression to connect with the inner self and the transcendent:
  - ✓ **Design Ideas: Our KS4 D&T curriculum encourages creative expression by providing students with opportunities to develop their own individual design ideas. Through open-ended tasks and personal responses to design briefs, pupils are able to express their thoughts, values, and interests. This creative process allows them to connect with their inner selves, imagining how their designs can have an impact on individuals or society.**

- Fostering a sense of belonging and interconnectedness with others, nature, and the universe:
  - ✓ **Target Markets: In our KS4 D&T curriculum, we foster a sense of belonging and interconnectedness by encouraging students to consider the needs and perspectives of others through identifying and designing for specific target markets. Collaborative activities such as peer feedback sessions further support this by helping students understand how their work affects and is received by others.**
  - ✓ **Design Theory: Our curriculum requires students to consider the impact of design on the environment and society. Through exploring environmental issues and the ethical responsibilities of both designers and consumers, pupils begin to understand how interconnected our choices are with the natural world. They learn how thoughtful design and responsible manufacturing can contribute to a more sustainable world.**

- Encouraging self-awareness, emotional intelligence, and moral reasoning:
  - ✓ **Evaluation: Through regular analysis and evaluation of their own design work and prototypes, students develop self-awareness and the ability to critically reflect on their decisions. This process fosters emotional intelligence as they learn to respond to feedback constructively and consider how their designs affect others. It also supports moral reasoning, as they adapt and improve their work with a focus on usability, ethics, and real-world impact.**

- Promoting open-ended investigations rather than just seeking right answers:
  - ✓ **KS4 Product Design Projects: Our KS4 D&T curriculum promotes open-ended investigation by giving students the freedom to explore a range of possible solutions within each design brief. Rather than working towards a single 'right' answer, pupils are encouraged to think creatively, justify their design choices, and develop unique responses that reflect their understanding and interpretation of the task.**

- Using hands-on activities, field trips and experiments to immerse students in learning and evoke wonder:
  - ✓ **KS4 Product Design, Practical Work: In our KS4 D&T curriculum, hands-on learning is central to the student experience. Pupils are taught a wide range of practical skills and are encouraged to work independently with tools, equipment, and machinery. This active engagement not only builds confidence and competence but also sparks a sense of wonder as students bring their ideas to life through making.**
  - ✓ **Visits: We enrich students’ understanding of design through a variety of hands-on activities, as well as trips to galleries and exhibitions where possible. These experiences expose pupils to real-world examples of creativity and craftsmanship, broadening their understanding and inspiring their own design thinking.**