Curriculum Information

Key Stage 4

Design Faculty

Shaping creative and confident students who better understand themselves and the world around them

For yourself & for others

Curriculum Intent

Design and Technology as Ashby School has been developed with the 'D&T learner' in mind, ensuring that students develop the skills, knowledge and understanding to …

Show Respect to the environment they work in
Take Responsibility to strive for high quality outcomes
Show Resilience as problem solvers who are not afraid of making mistakes

Key Stage 4 Design Technology

At Ashby School we want to create a diverse curriculum which is intrinsically linked to and fully embodies our learning ethos: Respect, Resilience and Responsibility.
Our intention is to inspire our students with a love for D&T to allow them to become confident individuals with inquisitive minds who will have the courage, skills and knowledge to thrive in the 21st century.
Through the delivery of our Design Technology curriculum students are better prepared to deal with tomorrow's ever-changing world.
D&T encourages children to become independent, creative problem-solvers and thinkers as individuals and as part of a team - making positive changes to their quality of life. It enables them to identify needs and opportunities and to respond to them by developing a range of ideas and by making products and systems.
We wish to instil a curiosity within our students which means they will ask questions and seek answers when creating new ideas, acquiring new skills and draw on disciplines such as mathematics, science, engineering, computing and art.
Finally, developing our students' sense of appreciation for the design/creative industry supports them in finding their own identity as young designers, enabling them to develop a greater sense of self- awareness and affirming their own ideologies or perception of what design really is. Design and technology offers children a chance to use creative thinking and activity within a defined purpose and tangible outcome. It can be found in many of the object's children use each day and is a part of children's immediate experiences.

Key Stage 4 Engineering

GCSE Engineering Studies - AQA - specification code 8852

The specification sets out the knowledge, understanding and skills required to design and manufacture an engineered product. Students develop a variety of practical skills through mini projects to prepare them for their final product in Year 11. Throughout Year 10, students will acquire knowledge and practise the practical skills required for their coursework; they will learn how to research, design and make a variety of mini projects that will help enhance their work in Year 11. The theory material delivered covers the requirements of the specification but also prepares the students for further study after GCSE.

Year 10

Practical lessons: The students will develop a range of practical skills alongside some core Computer Aided Design (CAD). Projects will include making a G-cramp, electronic light box, and Fusion 360 work. Students will also have the opportunity and be encouraged to use the school's laser cutters and 3D printers.

Theory lessons: Using ICT, students will acquire knowledge on engineering topics in order to apply this in the practical classroom. This is to equip students with the knowledge they need for their written examination. Theory topics are focused around materials, processes and manufacturing.

Homework is set on a regular basis and will be used to support theory lessons.

Year 11

The focus of Year 11 is to complete a written design portfolio (Non-Examined Assessment or NEA). Students follow the design process to research, design, manufacture and evaluate a product to a brief of their choice.

The design portfolio is worth 40% of a student's final grade and encourages creativity and high level manufacturing using at least two different materials and manufacturing techniques.

Key Stage 4 Engineering

Recommended text books:

AQA GCSE (9-1) Engineering ISBN: 978-1510425712 Hodder Education

My Revision Notes: AQA GCSE (9-1) Engineering ISBN: 978-1510425729 Hodder Education

Specification Link

https://www.aqa.org.uk/subjects/engineering/gcse/engineering-8852

Year & Half Term	Themes / Key Questions	Knowledge & Skills
10 Autumn (1)	Metals	Practical skills building project, learning basic use of tools and machinery and H&S requirements of the workshop
10 Autumn (2)	Materials	Developing skills in fabrication and machining, including finishing techniques and accuracy
10 Spring (1)	Processes, machining, wasting, forming, drilling, turning	CAD drawing, 2d and 3d, laser cutting and 3d printing processes
10 Spring (2)	Electronics, components and systems	Designing and modelling skills, presentation of design work
10 Summer (1)	Joining metals, welding, brazing, soldering	Mock NEA – developing skills in mind mapping, researching, designing and modelling
10 Summer (2)	Mechanical systems	Development of practical skills – in preparation for NEA Start of GCSE NEA assignment

Key Stage 4 Food Preparation and Nutrition

GCSE Food Preparation and Nutrition - AQA - specification code 8585

The specification sets out the knowledge, understanding and skills required to cook and apply the principles of food science, nutrition and healthy eating. Students will learn information about how you can apply nutrition through practical work, cooking of food and heat transfer, functional and chemical properties of food, food spoilage and contamination, principles effecting food safety, sustainability, food labelling and marketing, food processing and production and sensory evaluation. Throughout Year 10 students will learn and practise food preparation skills.

Year 10

Practical lessons - learning in depth food preparation skills including the application of molecular gastronomy. Students will also apply nutritional knowledge to dishes produced and explore the different types of food chemistry and functions. This prepares students for their NEA (non-exam assessment) in Food Science and their NEA in Food Preparation.

Theory lessons - Using ICT, students will build knowledge on the specification topics in order to apply this in the practical classroom. This equips students with the knowledge required for their written examination.

Homework - Students will research dishes to produce each week in practical lessons, around the given theme, which demonstrate the knowledge learnt in nutrition and food chemistry.

Year 11

The focus of Year 11 is to complete two pieces of NEA and revisit the knowledge learnt in Year 10 in order to revise for a written examination.

NEA Food Science investigation 15% - applying food science and chemistry knowledge to experiments and writing up the findings in a 1500—2000 word report/essay with photographs.

NEA Food Preparation 35% - produce a three course meal within a three hour timed assessment showing as many food preparation skills as possible around a set brief. Write up and evaluate the findings within a 20 hour written report.

Revision programme for the end of Year 11 - revisiting topics learnt in Year 10 - written examination 50%.

Key Stage 4 Food Preparation and Nutrition

Recommended text books:

Year 11 – AQA GCSE food preparation and nutrition – student book – ISBN 9781908682789

Specification Link

https://www.aqa.org.uk/subjects/food/gcse/food-preparation-and-nutrition-8585

Year & Half Term	Themes / Key Questions	Knowledge & Skills
10 – Autumn term 1	Health and safety, micronutrients, carbohydrates, organic, red tractor, emulsification, enzymic browning, HBV and LBV proteins, alternative proteins, preservation methods	Bread, flatbreads, soup, salad, stir fries
10 – Autumn term 2	Primary and secondary processing, hydroponic farming, GM foods, water, sugary drinks, NSP + fibre, soluble and insoluble NSP, gelatinisation, dietary choices, energy needs, reduction, diet nutrition and health, lactose intolerance, sustainable fishing, omega 3 and omega 6	Jams and chutneys, curries, ragu or tomato-based sauces, white sauces, pasta made using pasta machines, pesto, filleting fish and shellfish
10 – Spring term 1	Religious dietary need, ways to cook meat, different cuts of meat from different animals and cooking methods, denaturation, coagulation, plasticity, raising agents, eggs – types, uses and diagram, fats	Fish cakes, pork – toad in the hole, lamb - kebabs, beef – beef burgers, poultry – chicken Kiev, jointing a chicken, scones, muffins
10 – Spring term 2	Alternative dairy products, lactose intolerance, food spoilage, shortening, temperature control, bacterial contamination, names of food poisoning, food safety, foams	Swiss roll, cupcakes, flaky pastry, shortcrust pastry, choux pastry
10- Summer term 1	Preparing, cooking and serving food safely, religious dietary need, food choice, caramelisation, food labelling, food intolerance, sensory evaluation	Meringues, cheesecakes, layered desserts, biscuits, ice cream. Mock NEA2 practical in – healthy breakfasts, fakeaways, king's coronation street party food
10– Summer term 2	Traditional cuisines genetically modified food, Food packaging, Food security, Food Manufacture, Food Waste, Food Miles, Technological developments associated with better health, sustainability, food security	Mock NEA1 investigation – raising agents and properties in scones

Year & Half Term	Themes / Key Questions	Knowledge & Skills
11- Autumn term 1	NEA1 – topic launches 1st September till 31st October – food science investigation – 1500-2000 words - 15%	3 separate food science experiments / investigations covering the topic set for NEA1
11- Autumn term 2	NEA2 – topic launches 1st November until Easter holidays – food preparation – 35%	4 dishes themed around a culture or country topic set by the exam board
11- Spring term 1	NEA2 continuation – 20 slides in total	4 dishes themed around a culture or country topic set by the exam board
11- Spring term 2	NEA2 continuation – 20 slides in total	NEA2 practical continuation – 3 further dishes made covering same culture or country set by exam board – table display
11– Summer term 1	Revision for written exam – recapping topics on food nutrition, food preparation, food science, food choice and food provenance covered in year 10	Revision

Key Stage 4 Resistant Materials

GCSE Design and Technology - Resistant Materials - AQA - specification code 8552

The specification sets out the knowledge, understanding and skills required to design and manufacture a resistant materials product. Students will develop a variety of practical skills through mini projects to prepare them for their final product in Year 11. A large amount of theory is covered in practical lessons as well as through ICT. This will include materials research, as well as CAD/CAM packages including: Google sketch-up and 2D Design.

Year 10

Practical lessons - Students develop a range of practical skills alongside core Computer Aided Design (CAD) skills. Projects may include dovetail boxes, picture frames and tables. Students will also have the opportunity to use the school's laser cutter and 3D printer.

Theory lessons - Using ICT students will acquire knowledge on the specification topics, this is to equip students with the knowledge required for their written examination. Theory topics are focused around materials, processes and manufacturing.

Homework - This is set on a regular basis and will be used to support theory lessons.

Year 11

The focus of Year 11 is to complete a written design portfolio.

The students will follow the design process to research, design, manufacture and evaluate a product to a brief of their choice.

The design portfolio is worth 50% of a student's final grade and encourages creativity and high level manufacturing.

Revision programme for the end of Year 11 - revisiting topics learnt in Year 10.

Key Stage 4 Resistant Materials

Recommended text books:

D&T GCSE - ISBN 978-1-910523-24-7

Specification Link

Year & Half Term	Themes / Key Questions	Knowledge & Skills
10 Autumn (1)	Practical: Dovetail/comb joint box Theory: Unit 5 – Timber based materials	Timber sources and classification. Production techniques and stock forms. Commercial manufacturing and joinery techniques. Understand how to produce a dovetail or comb joint Understand techniques for gluing structures Finishing techniques. Sustainability and ethical factors. Identify common tools and machinery and their uses. Identify types of PPE and their uses. Identify different health and safety signage and their meaning.
10 Autumn (2)	Practical: Small drawer for dovetail/comb joint box Theory: Unit 3 – Materials and their working properties	Understand the term tolerance Understand how to produce a comb joint Understand how to operate a wood lathe Knowledge of Metals/Textiles/Papers and Boards/Plastics
10 Spring (1)	Practical: Mirror frame Theory: Unit 4 – Specialist technical principles	Understand how to produce a mitre-halving joint Understand the term inlay Understand the term chamfer Understand further techniques for gluing structures Identify further tools and machinery and their uses. Students will develop knowledge of Forces and Stresses on materials, improving functionality, social footprints, the 6r's of recycling, scales of production
10 Spring (2)	Practical: Laser cutting and assembly of all previous practical parts into full cheval mirror Theory: Unit 6 – Designing Principles	Understand the term CADCAM Understand the basic stages of the CADCAM process. Understand the health and safety regulations for operating a laser cutter. Understand the use of basic tools and fittings in the assembly of a product. Designing principles (theory) The work of others design strategies, communication.
10 Summer (1)	Practical: Drawing techniques Theory: Unit 6 – Designing Principles	Knowledge of the new NEA contexts, the assessment criteria, and various research methods required to cover all NEA objectives. Designing principles (theory) Sketching, oblique, isometric and orthographic drawing
10 Summer (2)	Coursework: NEA Research and designing.	Knowledge of the new NEA contexts, the assessment criteria, and various research methods required to cover all NEA objectives. Designing principles (theory) The work of others design strategies, communication.

Year & Half Term	Themes / Key Questions	Knowledge & Skills
11 Autumn (1)	Coursework: NEA designing and modelling. Theory: Unit 7 – Making principles	Selection of materials and components Tolerances and allowances Material management and marking out Specialist tools, equipment, techniques and processes surface treatments and finishes
11 Autumn (2)	Coursework: NEA modelling and manufacturing. Theory: Unit 7 – Making principles	Selection of materials and components Tolerances and allowances Material management and marking out Specialist tools, equipment, techniques and processes surface treatments and finishes Model making techniques and selection of materials for this. Manufacturing final NEA prototype
10 Spring (1)	Coursework: NEA testing and evaluating. Theory: Unit 1 – New and emerging technologies	Evaluating skills. Industry and Enterprise Sustainability and the environment People, culture and society Production techniques and systems Informing Design decisions
10 Spring (2)	Coursework: Intervention and improvements Theory: Unit 2 – Energy, systems, materials and devices	Energy generation Energy storage Modern materials Smart materials Composite materials and technical textiles Systems approach to designing Electronic systems to designing Mechanical devices
10 Summer (1)	Theory: Revision	Recap and Revise Core Elements- Units 4,5,6,7 Analysis of exam paper and sample papers

Key Stage 4 Textiles

GCSE Art and Design (Textiles and Fashion) - AQA - specification code 8204c/x

This is an exciting option for students with interest in Textile art and design. It will provide a good foundation for further study at A-level and would be useful for pursuing a career in art and design, including fashion design, interior design, printed, knitted or woven textiles, costume design or working in any creative based industry.
You will be required to explore both traditional textile techniques and modern approaches to textiles. Successful students will be prepared to experiment and explore the different possibilities within textiles.

In year 10 you will explore lots of different textile techniques through a range of mini projects and one extended project. Developing your ideas through researching artists and designers and set themes. You will produce a portfolio of work with final outcome/s showing that you can make a personal connection within your work. This work will contribute to 60% of your final course grade.

In year 11 the exam board will give students a range of themes to explore. Students will choose one to explore. They will produce a portfolio of work showing their ability to record information visually, research relevant artists/ designers, experiment with materials and make a personal response to a theme. There will be one final practical exam in year 11 (10 hours spread over 2 days). The exam makes up 40% of your overall mark.

Key Stage 4 Textiles

Recommended text books:

The art of fabric manipulation ISBN 10: 0801984963

Specification Link

https://www.aqa.org.uk/subjects/art-and-design/gcse/art-and-design-8201-8206/subject-content/textile-design

Half term	Theme/key questions theory	Theme practical/project work	Knowledge
Year 10 Half Term 1 AO3 AO1	Students will gather visual imagery to develop their ideas through the research of artists/designers.	Basic sewing skills on the machine through; ***''Surface decoration''***	What is a critical Analysis? How to explore an artist/designer?
Year 10 Half Term 2 AO2 AO4	Students will gather visual imagery to develop their ideas through the research of artists/designers.	***'Surface decoration cont'' and ''Applying colour''*** *Artist workshop- TBC* Making a final outcome - refining and developing	How to present a meaningful and personalised response. How to refine and develop when making a final outcome.
Year 10 Half Term 3 AO4	Students will create a personal and meaningful response.	Making a final outcome - refining and developing	How to present a meaningful and personalised response How to refine and develop when making a final outcome.
Year 10 Half Term 4 AO1 AO3	Students will be using all of their skills developed when researching the new theme **'' Structures''**	Students will need to select a minimum of 2 appropriate artists to explore.	How to start to research a theme. Take primary imagery as a starting point.
Year 10 Half Term 5 AO1 AO2	Students will gather visual imagery to further develop their ideas.	Students will develop practical skills by responding to the work of their chosen artists.	How to respond to their artist of choice
Year 10 Half Term 6 AO3 AO4	Students will create a personal and meaningful response.	Students will create design ideas in the lead up to the mock exam in orde r to experiment, develop and refine.	Students will have the skills to develop and refine.

Half term	Theme/key questions theory	Theme practical/project work	Knowledge
Year 11 Half Term 1	Students will evaluate and develop their final outcome.	Students will research another artist to gain inspiration for their final outcome.	Students will have the skills to develop and refine.
Year 11 Half Term 2 AO1 AO3	Students will be using all of their skills developed when researching the new theme **given to them.**	Students will need to select a minimum of 2 appropriate artists to explore.	How to start to research a theme. Take primary imagery as a starting point.
Year 11 Half Term 3 AO2	Students will gather visual imagery to further develop their ideas.	Students will develop practical skills by responding to the work of their chosen artists.	How to respond to their artist of choice.
Year 11 Half Term 4 AO4	Students will create a personal and meaningful response.	Students will create design ideas in the lead up to the mock exam in order to experiment, develop and refine.	Students will have the skills to develop and refine.
Year 11 Half Term 5	All work submitted for final assessment (May 31st)		