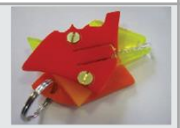
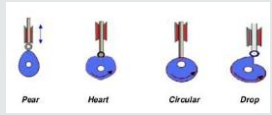
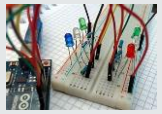
Design & Technology

Key Stage 3

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 7	PD Skills Passport 	Acrylic Torch 	Designing through sketching, modelling 	Phone Stand Storage Pot 		CAD CAM Sharpener 
	E-Textiles Skull Fabric Torch 			Catering Skills Passport 	EWP  Grill  Hob 	Fish  Oven 
Year 8	Acrylic Pen 	USB Desk Lamp 		Functionality and Aesthetics 	Problem Solving 	Beach Huts 
	Mechanical Systems and Movement 	Forces and Stresses 		Baking Braising Frying 	Proteins Fats Carbohydrates 	Taste testing  Climate Change 
Year 9	Coat Hook 	Ergonomic Toothbrush 	Electronics Testing 		Sheet Metal Animal 	Recycling Upcycled 
	Breads 	Cakes 	Pastry 	Street Food 	Special Diets 	Getting ready for GCSE 

Design & Technology: Product Design

Key Stage 3 – Year 7

In Year 7 you will learn about ……..

Term	Topic	Knowledge, Skills and Understanding
Autumn 1	DT Skills Passport	Students will develop an understanding of the importance of health and safety in the workshop as well as the need for accuracy when making a product. They are introduced to a range of hand tools as well as the line bender / strip heater and the polisher. They will learn how to recognise a hazard in the workshop and understand safe practice and the expectations of the department. Students develop practical skills such as using templates, filing, finishing and using a wide range of tools and equipment safely and successfully.
Autumn 2	Acrylic Torch	Students will develop understanding of the design process with the main focus being on their ability to design and develop a range of ideas using the theme of 'organic design'. They are introduced to a range of graphical and presentation techniques and develop their ability to produce a high quality finished product and use a wider range of tools and equipment within the workshop. They use Acrylic to produce their product and are introduced to some basic electronics and how to assemble the components correctly. They learn how to recognise an LED, how to use a design brief when designing and examine the properties of thermoplastics and thermosetting plastics. They will be expected to work to a tight specification throughout and to evaluate work at all stages of the project to ensure a successful finished outcome.
Spring 1	Designing through sketching and modelling	Students will demonstrate an ability to sketch ideas in 2D and use a variety of mark making techniques to express their ideas on paper effectively adding depth and form using shading. They will learn how to create oblique and isometric views of simple forms and be able to define 'perspective', 'horizon line' and 'vanishing point' and understand how they are used to create a perspective drawing. They will learn how to create an accurate net for a cube and a pyramid and understand the importance of creating 3D physical models. They will work with materials and equipment to make physical models including computer aided design (CAD).
Spring 2	Phone Stand Storage Pot	Students will develop understanding of the making process with the main focus being on their ability to produce a high quality finished product. They are introduced to the properties and characteristics of timbers and manmade boards and learn how to identify them. They will use at least two different types of material to produce their product (softwood, hardwood, man-made) and are introduced to how to shape and form wood correctly. They learn how to use a manufacturing specification and how to analyse existing products using ACCESSFM. Students develop evaluative practical skills including making, planning and using templates.
Summer 1		N.B The CAD project is a roaming project and groups will complete this at different point in the year
Summer 2	CAD CAM Sharpener	Students will be introduced to the programme Fusion 360 whilst gaining experience and confidence of using the 3D printer. Students are introduced to the basic tools on Fusion 360 and shown how apply these. They will also work with a new material, either PLA or ABS to produce their product. Skills learned during this CAD CAM project include how to dimension a product, sketch simple shapes, boss extrude shapes, shell shapes, produce a linear pattern, smart dimension a shape and combine shapes, all using Fusion 360.

Design & Technology: Product Design

Key Stage 3 – Year 8

In Year 8 you will learn about ……..

Term	Topic	Knowledge, Skills and Understanding
Autumn 1	Acrylic Pen	Students will learn how to design a product that is fit for use and produce an accurate high quality finished product. Students are also reminded about the properties and characteristics of plastics. They will also learn about health and safety symbols used in industry and how to work to a range of restrictions. They will learn about working drawings and how to produce and use them as well as how to accurately mark out material using templates. Practical skills such as marking out, drilling, sawing, finishing will also be explored.
Autumn 2	USB Desk Lamp	Students will develop an understanding of working with mixed materials and are also reminded about the properties and characteristics of plastics and timbers as well as introduced to some properties of certain metals. Students will also experience some simple electronics and soldering. They will learn about working to a design brief and a tight set of restrictions, particularly material availability. Students will use client feedback to inform designs as well as using oblique sketching. They will accurately mark out material using a template, use the vacuum forming machine and develop practical skills such as marking out, drilling, sawing, finishing and assembling.
Spring 1		
Spring 2	Functionality and Aesthetics	Students will learn the different ways to research a design problem and select and conduct appropriate research methods to investigate a design problem. They will develop subject vocabulary with the terms: user, client, target market and ergonomics. They will be able to use a product analysis to determine user needs and create a design specification based on the needs of different consumers and focus groups. They will generate a range of appropriate and creative design solutions for disabled users and identify impairments and empathise with disabled user groups. They will explain and demonstrate the iterative design process and develop and improve design ideas using prototypes. They will test and evaluate ideas individually and as part of a team using constructive criticism and justify potential problems and offer solutions.
Summer 1	Problem Solving	Students will understand the terms form, function and aesthetics and that good design needs to consider and balance all three. They will learn what factors make a product aesthetically pleasing and recognise elements of good design over bad. They will understand the meaning of the term biomimicry and be able to describe different structures found in nature and how they function. Students will recognise how and why natural forms and structures are used to inspire design and new materials. They will explore where geometric and organic shapes found in nature have been used to create manmade structures. Students will generate their own design ideas inspired by organic forms and biomimicry. They will use simple tools and materials to produce models and learn how and why scale models are used.
Summer 2	Beach Huts	Students will have a visit to a local beach at a seaside town. They will need to explore the area and investigate potential sites for some new beach huts. The beach huts are to be inspired using user centred design. The students will need to identify a user group, gather relevant information from the site visit and then in the following weeks, design, develop and model a beach hut that would be suitable for their user group. Students will produced both cardboard and foamboard models.

Design & Technology: Engineering and Catering

Key Stage 3 – Year 8

In Year 8 you will learn about ……..

Term	Topic	Knowledge, Skills and Understanding
Autumn 1	Mechanical Systems and Movements	Students will learn to recognise and name the four different forms of movement and give examples of where the different forms of motion can be found. They will learn how levers and linkages work and how they can make moving a load easier. They will learn the different orders of lever and give example of where they can be found as well as understand how different levers and linkages gain a mechanical advantage and make some tasks easier. They will explore specialist levers, linkages and rotary mechanisms. Students will learn how an input motion can be changed to a different output motion by using different mechanisms. They will learn to recognise the differences in different rotary cams and how they interact with different followers. Students will use different cams and followers to design mechanisms. They will develop an understanding of, and be capable in the selection of different mechanical components to make a working mechanism which they will then model in card and other materials to make simple prototype mechanisms. Students will develop their subject specific language including; input, output, load, effort, fulcrum, lubrication, idler, velocity, transmission, velocity ratio and how to calculate it in a given system. Students will be able to name and describe each of the different forces and stresses as well as recognise how materials have been stiffened or reinforced through the use of bending, lamination, folding, webbing and interfacing. They will develop an understanding of the impact of forces and stresses on different materials and objects and learn how a material may be reinforced or stiffened using a range of techniques. Students will explore the effects of a change in magnitude and direction of a force on a specific material or object.
Autumn 2		
Spring 1	Forces and Stresses	
Spring 2	Safety Cooking Methods Tasting foods	Students will develop their understanding of the importance of health and safety in the kitchen as well as the need for accuracy when cooking or baking. They will improve their ability to use a range of equipment including weighing scales, the cooker and the hob. Students improve practical skills such as knife skills, weighing and measuring, using the cooker and hob and food safety through making Muffins, Flapjack. Students will also gain new experiences building a subject vocabulary on taste testing
Summer 1	Cooking Methods	Students will expand their range of cooking methods through making a Bolognese sauce and a Risotto they will experience, sautéing, seating, braising and reductions. They will be introduced to fat- and water-soluble vitamins exploring why these nutrients are important for our bodies
Summer 2	Climate Change Special Diets	Students will look at how our choice of food can add to climate change by adding up the Food Miles of a Pizza, They are introduced to special diest that chefs need to consider when planning meus ensuring customers can still receive the required nutrients making a Quorn Wrap suitable for a Vegan. At the end of their time in Catering we will combine their skills to make a Cheesecake looking at using temperature and acids to set foods.

N.B, Engineering and Catering are on a carousel, students spend half the year in one of the subject areas before changing over at February half term

Design & Technology: Product Design

Key Stage 3 – Year 9

In Year 9 you will learn about ……..

Term	Topic	Knowledge, Skills and Understanding
Autumn 1	Coat Hook	Students will be introduced to a range of skills and knowledge that is closely linked to the Engineering course we offer at Key Stage 4. They material area for this project is metals, this allows students to use some new tools, equipment and machinery. Students learn how to mark out on metals which is a different process to that previously used when working with timbers and plastics. They will also have the opportunity to use the brazing hearth to anneal their material and complete an additional process – dip coating, As well as these new practical skills students will learn about, risk assessments, what the are, how to use them and how to produce one.
Autumn 2	Ergonomic Toothbrush	Students will develop ideas for an ergonomic toothbrush using an iterative design process, they will generate and refine design ideas using sketching, modelling, testing, prototypes and evaluating. They will develop the aesthetics and form of their design to appeal to the user. During this unit students will learn to generate a range of suitable design briefs. Students will develop their subject vocabulary with words including aesthetics, form and ergonomics. They will use this to demonstrate their understanding of ergonomics by designing a product that is fit for purpose. They will test and evaluate designs based on feedback and differentiate between good design' and 'design for good'.
Spring 1	Electronics	
Spring 2		
Summer 1	Sheet Metal Animal	Students will develop their understanding of metals including what we mean by ferrous, non ferrous and alloys. They will learn which materials belong to each category and suitable applications for each. During this project they will generate concepts for products that could be sold at a zoo giftshop. Students will learn to work to a set of design criteria as well as learning about the impact of waste and how economic use of materials can help to reduce this. They will learn some new practical skills and use a range of new tools and equipment.
Summer 2	Recycling Upcycled	Students will explore a range of environmental contexts including The six R's and sustainability. They will learn all about re-purposing and re-designing objects around us using practical, fun tasks. This unit is all about seeing objects around us and working out how we can take some parts of it and change their purpose and change its look to a new or fresher object. The object often becomes more useful or nicer than it previously was. Students will find some ideas for changing some objects and look at different uses of an object.

Design & Technology: Catering

Key Stage 3 – Year 9

In Year 9 you will learn about ……..

Term	Topic	Knowledge, Skills and Understanding
Autumn 1	Breads	Students will be introduced to a range of skills and knowledge that is closely linked to the Hospitality and Catering course we offer at Key Stage 4. They will look at the effect of ingredients while making several sweet and savoury yeast-based bread products. Learning how to combine solids and liquids correctly, kneading to understand the working properties of gluten and the effect of heat for dextrinisation.
Autumn 2	Cakes	Student will cover skills in preparation for Unit two in KS4, they will experience how chefs use the melting, creaming and whisking methods to make a selection of cakes. Students will also look at how decoration can influence customer's choice of foods. Students will be introduced the macro and micronutrients and begin to explore the effect that macronutrients gave on our body.
Spring 1	Pastry	Students will develop an understanding of short crust, sweet and puff pastry and make a selection of pastry products. They will deepen their working knowledge of gluten gained from the bread topic and extended further their repertoire of savoury dishes. Students will be introduced to using differing equipment such as rolling pins and flan rings or moulds
Spring 2	Street food	Students will gain experience and knowledge of popular culture in food through cooking several foods that are popular in Britain because of immigration. Pupils will produce meals from Asia, India and Europe. In theory lessons students will learn of the consequences of importing ingredients to the planet and the advantages of buying locally sourced seasonal foods.
Summer 1	Special diets	Students will be introduced in both theory and practical lessons to the Nutrional requirements of differing group of people. They will look at Vegans and how they need to sue protein complementation. Low fat diets and how fats and sugars affect the body and finally how to adapt recipes for a gluten intolerance and the consequence of mislabelli9ng foods for allergies
Summer 2	Getting ready for GCSE	In the last term students will be prepared for Key Stage 4. theory work will be linked to prior learning of nutrition, special diets, allergies and intolerances al underpinned with food hygiene and safety. By the end of the term pupils should have been introduced to how the key stage 4 qualification will run and how they are expected to present their work both theory and in practical.