

Early KS3/Y7 – Learning Units

Focus	Textiles	Food	Product Design	Systems and Control
Mainly Designing 2-5 hrs	1 - LEARNING TO LOOK How do we generate and communicate design ideas in textiles? How does nature influence design? In this unit students look at communication on paper using different methods and how to use annotation effectively. It then considers biomimicry as a means of solving design problems, the use of CAD software to manipulate images to make colourways and appropriate printing methods.	4 - CATERING FOR NEEDS Generating food products to meet the needs of the consumer. This considers consumer needs and choices and how to plan diets for children, teenagers, the elderly, vegetarians, and medical and religious needs. It considers adapting recipes using alternative ingredients. In the practical session students are asked to adapt a lasagne to meet the needs of a vegetarian consumer.	8 - CORE SKILLS Learning to develop basic design communication skills including sketching, drawing controlled lines, 3D sketching, annotation, emphasising key points and knowing which points to highlight to get the design ideas across.	12 - ON THE LEVEL Designing a casing design for a digital product which uses a number of components, concentrating on its form and function. How would it be developed for different users and markets? The unit includes sections on communicating ideas, using ergonomic and anthropometric data when designing, use of CAD software to capture and make changes to a design and an awareness of modelling and production techniques.
Mainly Making 3-4hrs	2 - UNDERSTANDING FIBRES AND FABRICS What are the properties of fabrics used today and why is it important to understand this? How do we add print and stitch to our fabrics to make them more interesting? How do practising designers achieve this? This unit considers the origins of natural and man-made fibres, the methods of construction and properties of these and how they are adapted by adding colour and decoration, with examples from current textiles designers.	5 - PRACTICAL SKILLS BUILDING This covers the introduction to the kitchen environment, food safety and safe working, establishing routines and building basic culinary skills. It considers at food safety through personal hygiene and the 4 Cs, as well as healthy eating principles. Practical lessons have students making baked beans on toast, a fruit salad, ratatouille and bolognaise.	9 - SIGNS A large local store has asked students to manufacture their signage. Use a digital image to then laser cut the existing sign. Improve on this using a specification developed with the client and make a prototype to send to company. Includes understanding of signage and logos to develop brands and convey visual messages.	13 - DUSK LIGHTS ON Designing with a transistor sensing circuit, which could be used in a variety of different settings. The circuit is made using a standard PCB, but one which allows for the learner to customise its operation to suit their particular requirements. Students consider a range of components and systems to design a system that will turn on a light (LED or bulb) when it gets dark.
Design and Make 6-8hrs		6 - DESIGN FOR HEALTH Producing a healthier meal aimed at teenagers. Students investigate factors affecting food choices before designing and making a meal suitable for a teenager. They consider factors such as the importance of a balanced diet, cost, availability, cultural and religious practices and health concerns. Practical lessons include making a stir fry, a curry and kofta before working independently on their final choice of meal.	10 - JEWELLERY DESIGN Design and make pewter cast jewellery to a given theme. In this students research and develop a brief, develop a specification and from this generate ideas for designs. Using CAD software they model and test their designs, and produce a mould before casting and finishing their designed product.	14 - TOUCH TORCH Design and make a product for the 21st Century, using LED(s) and with NO moving parts - touch operated. Students should disassemble and analyse a product to see what it is made of and how assembled, its form and function and whether parts can be recycled. They then design and make a torch using a circuit, having understanding of circuit diagrams, PCBs and the components. They must make the circuit, casing using CAD, and model it before evaluation.
Technology in Society 2hrs	3 - WIDER USE OF TEXTILES How are textiles used in today's society? How has conductive thread and fabric, use of composite textiles in the automotive industry and the use of textiles in medicine had an impact on our world? Using this, students should understand the wider role of textiles in everyday lives, beyond fashion and furnishing. They should investigate technical textiles for specific uses and demonstrate an understanding of the wider use of textiles. Examples from a range of industries are used to illustrate different uses and applications.	7 - FUTURE FOOD This unit considers how we might feed the world population in the future using lab-grown meat or insects as an alternative food source by investigating new and emerging technologies and investigating alternative food production methods.	11 - ECO DESIGN This introduces the concept of designing with the environment in mind, using examples from a range of familiar products, re-thought in keeping with the Six Rs principles. It discusses a product's life cycle and the 'cradle to the grave' concept. Using waste materials students are asked to design and make a new product prototype reusing waste items.	15 - MOBILE PHONE - BRICK & BUTTONS TO SLIM & TOUCH How a modern product has developed over time, what change has there been to their form and function during that time? What developments have taken place in electronics that have driven the development of the mobile phone?

Mid KS3/Y8 – Learning Units

Focus	Textiles	Food	Product Design	Systems and Control
Mainly Designing 2-5 hrs	16 - DUAL PURPOSE TEXTILES How can technology be included into textiles products to give them added value? Can this improve the quality of people's lives? This introduces students to the Portable Light project which combines a traditional textiles product with solar power. They produce ideas for a design of a dual purpose product and develop the design with annotated drawings using a 2D CAD package.	19 - MULTICULTURAL MEALS FOR MATES In this unit students will investigate designing multicultural meals that are suitable for teenagers. They will develop and understanding of different needs and wants and demonstrate an understanding of the need for a healthier ethnic dish using different research methods, then generate possible design solutions including costs.	23 - ANALYSE THAT Analysis of famous or household products to help learn about products and inspire for own design work. Students consider a number of products and use the analysis to help them develop their own design specification for a new product.	27 - ELECTRONIC MUSICAL TOY Casing design for a toy musical device, which uses a new music chip specifically designed for use in toys and related products. This can be used in a range of ways that allow a wide range of 'instruments' to be created, with suitable casings for the target market of young children. Students will need to investigate circuits and manufacturing methods, applying a design brief and specification, as well as using CAD to make 3D models of their designs and presenting their ideas.
Mainly Making 3-4hrs		20 - PROTEIN FOODS In this students will be developing a range of preparation and cookery methods whilst making protein rich dishes. They will list the sources and function of protein in the diet, describe the consequences of a diet lacking in protein and explain the different needs for protein at different life stages. They will then prepare a selection of ingredients for a range of dishes, following recipes and demonstrating safe use of equipment.	24 - SALAD SERVERS Students develop an understanding for a basic product: salad servers and explore how design can improve the product. They investigate a range of options before producing a specification, making examples and considering finishing techniques.	28 - MOODY LIGHTS Students manufacture a mood light using an RGB LED or one or more Red, Green, Blue LEDs that will respond to the environment where it's located, using such sensors as heat, light, movement/ vibration. Following an introduction to 'softwired' microcontroller circuits and different the sensors and outputs, students go on to create a circuit diagram and programme from a range of options before planning the production and testing of the boards.
Design and Make 6-8hrs	17 - TEXTILE ENTREPRENEURS Design and make a simple product that could be made in small quantities to sell in an independent gift shop. How is making one product different from making a number of identical ones? Students are asked to design and make a textile product that could be made in small quantities to be sold in a gift shop. They must research the customers and products and choose appropriate equipment, techniques and materials for their product. Working in teams they will devise production plans and look at cost considerations before manufacturing and testing their products.	21 - DESIGN and MAKE YOUR SCHOOL LUNCH Working within national constraints of the School Food Standards students will design an appropriate main meal for school lunches. They will know how to plan, prepare, adapt and cook a suitable meal for a given need, understanding the requirements for it to be nutritious and healthy. Practical sessions include adapting, preparing and evaluating their dishes against set criteria. They will also understand the benefits of a balanced school lunch and suggest further recipe ideas compared to the Eatwell Guide group of foods.	25 - LANTERNS Design and manufacture a small batch of identical lanterns based around a theme. Students work in groups to design and manufacture lanterns to help them understand manufacturing processes including batch and scales of production.	29 - SMART BOARD GAME Design and manufacture a prototype interactive board game. The board has to be able to sense and respond to the player's pieces and then create random effects such as lighting and sound. The board may also include an embedded dice using an appropriate display system. Students will develop design strategies to develop ideas that meet a design brief, use CAD to develop as basic design and develop an appropriate program. They will need to be aware of costs and processes in manufacture, present their ideas and evaluate their proposed solution.
Technology in Society 2hrs	18 - TRUE COST OF TEXTILE TECHNOLOGY What are the positive and negative impacts that technology has had within textiles? In this unit students look at how technology and cost considerations have affected the production of textiles, the emergence of 'eco fashion' and what consumers can do to promote eco friendly fashion.	22 - THE APPLIANCE OF SCIENCE Students will investigate new and emerging technologies used in the production of food including an understanding of the key terms associated with molecular biology. They will understand that food can be altered to look and taste differently and how it might be presented. The work of a number of inventive chefs is featured.	26 - FLOATING GARDEN CHALLENGE Develop an awareness and understanding about how design can solve real problems in parts of the world where natural disasters occur. Students consider images of flooding and drought and the impact this can have. They are introduced to Practical Action and the work they do in developing countries including Bangladesh where floating gardens help crops survive floods. Students then design and build a model raft of a floating garden and test it using weights.	30 - MUSIC PLAYERS - VINYL 2 TAPE 2 DISC 2 CHIP During the last 40 years the way we store and listen to music has change beyond recognition, from vinyl to chip. What is the science behind how we stored music on vinyl discs, tape, compact discs, DVDs and chips?

Late KS3/Y9 – Learning Units

Focus	Textiles	Food	Product Design	Systems and Control
Mainly Designing 2-5 hrs	31 - PARATRIATHLETE DESIGN CHALLENGE How do para-athletes customise their sportswear to accommodate their needs? Students develop a design specification from research into the restrictions para-athletes face. Working as part of a team they must develop designs in creative ways and present these, giving reasons for their final choices.	34 - STANDARDS FOR FOOD This unit looks at national quality assurance standards for assuring quality food in the UK and asks students to consider factors that ensure food is of the necessary quality through the use of ingredients that are sustainable and meet ethical and moral standards. It includes a practical session cooking their chosen dish.	38 - ADVANCED MODELLING Developing skills in CAD/CAM to help communication and modelling. Students explore modelling and advanced modelling using CAD/CAM and 3D printing before producing an electronic portfolio and using CAD software to produce a model of their choice.	42 - ACTIVITY TOY Here students design a prototype electronic system that could be embedded in to a young child's activity toy that uses a number of inputs and outputs. The toy will need to match the age of the child and take into account the environment in which it is expected to function. The focus is to adapt a design problem to a particular use and create a specification based on the design brief that results in an appealing, functional and innovative product. Students must also present their ideas and refine their design ideas based on feedback.
Mainly Making 3-4hrs		35 - CHILLED READY MEALS This unit looks at national quality assurance standards for assuring quality food in the UK and asks students to consider factors that ensure food is of the necessary quality through the use of ingredients that are sustainable and meet ethical and moral standards. It includes a practical session cooking their chosen dish.	39 - DOES IT CONNECT Working on a group project to manufacture pieces accurately to produce a large scale model of an animal or product using jigs and templates. Students learn about jigs, former patterns and moulds before a practical session to manufacture a model.	43 - RESCUE ME In this unit students are asked to manufacture a prototype rescue aid for walkers, climbers etc, using POV (Persistence of Vision) to display one or more messages, that would help rescuers locate them in case of an emergency. They should create a production schedule, select the appropriate materials and method for manufacture and use CAD/CAM in the development of the product.
Design and Make 6-8hrs	32 - FESTIVAL HEADGEAR Head gear is a popular feature at many types of festivals – why is this and how is it used? Choose a festival and create designs to be worn. What happens when a client changes the design brief part-way through a project? Adapting designs to be made within a given time and resource constraints. Evaluate prototypes and suggest modifications for a circular economy approach. Although this is a Designing and Make unit – there is deliberately a considerable emphasis on evaluation within the whole process. The assessment objectives reflect this.	36 - EVENT FOOD Investigating the breadth and variety of food served at festivals and events. Students determine what needs to be considered when considering food provision, including preparing suitable dishes and considering environmental issues.	40 - LEARNING TO LEARN Students design and make an educational product for a child, identifying a 'client' (child between 0-5) and understanding her needs, wants and interests; conducting product analysis, generating ideas and a specification, prototyping and planning production, manufacturing and evaluating the product.	44 - ANIMATRONIC CREATURE Students will design and manufacture of a small scale prototype Animatronic prop for either a stage show or television programme. This unit of work is the culmination of the KS3 work in Systems & Control; it also draws upon the other areas of Design and Technology in a multimedia way to solve a design and make task. It requires students to create a control system, apply mechanisms to control movement and use CAD/CAM to make a working prototype.
Technology in Society 2hrs	33 - WEARABLE TECH What is wearable tech? Is it a gimmick? How is it currently used? Consider aesthetic vs performance enhancing properties. What would you design? This asks students to evaluate existing wearable technology products and generate ideas for garments that include light, sensors temperature control and which are controlled by smart phones.	37 - HYDROPONICS – WORKING WATER Investigating alternative food production methods to ensure food production. Students investigate and discuss the benefits and drawbacks of using hydroponics systems to grow plant-based foods.	41 - EVOLUTION AND THE FUTURE Through evaluating products that have changed e.g. can openers, mobile phones, irons, vacuum cleaners etc. students gain an understanding of evolution and what factors make products change. Using the concept of biomimicry they design the next generation of their chosen product for the future.	45 - KNIGHT RIDER - COMPUTERISED CARS Exploring technology that a few years ago was only seen in movies or was considered science fiction. How close are some of these features nearing reality today and why? Focusing on computerised cars this helps students understand the role of electronics and new technologies in developing products that we use every day.