

Information for interview candidates

Preparing for the interview:

1. Find out about The Design and Technology National Curriculum at Key Stage 3 - years 7, 8 and 9. <https://www.gov.uk/government/publications/national-curriculum-in-england-design-and-technology-programmes-of-study>
2. Read through the Subject Knowledge Audit and complete with your specialist knowledge.

The interview process:

There will be a group interview with other trainees applying to a variety of subjects, held by The University of Roehampton Education Lecturers.

You should be prepared to talk in a group situation about a lesson you have seen recently and a topical issue within education which is of interest to you.

You will also be asked to complete a short-written task, common to all secondary subjects, where you will respond to a short article.

There is a short maths test to complete.

You will be interviewed by a Senior Design and Technology Lecturer lasting approx. 30 minutes.

Bring to the interview:

1. Please bring a Collection of your work to present and discuss, focussing on elements that you believe will help you to become an Inspiring and Creative Design and Technology Secondary School Teacher.

The work can be in a Portfolio or Sketchbook or Digital Images on a laptop on a memory stick.

2. Complete and bring the Design and Subject Knowledge Audit to the interview to be discussed during your interview.

If you have any queries please contact: ruth.seabrook@roehampton.ac.uk

Design & Technology Subject Knowledge Audit

The PGCE Secondary D&T course aims to develop you such that you will be best able to teach the National Curriculum for D&T. By the end of the course, you should have the core competencies (DATA 2014) in the context of design and technology and be able to relate them to the knowledge, understanding and skills of your main specialist field to teach to key stage 4 and beyond. During the course, you will also gain the knowledge, understanding and skills to teach at least one other specialist field at Key Stage 3.

The specialist fields are **Electronics & Communication Technology (ECT), Food Preparation and Nutrition, Resistant Materials Technology, Textiles Technology.**

Introduction

On entering the course, you will have a D&T relevant degree and some of you will also have professional/ industrial experience in at least one of the four D&T specialist areas of ECT, Food, Resistant Materials and Textiles

This Initial audit is to be used to help you identify your current knowledge, understanding and skills in the above subject areas and to help you decide what your second subject specialism would be.

Competence description
C.1 Understand and use a range of strategies and approaches to identify and clarify design problems.
C.2 Compile a design brief and specification. Know that a product design specification may have a number of requirements design ideas throughout designing and making.
C.3 Research a wide range of information sources appropriate to the problem. Analyse and select this information to inform their designing.
C.4 Use creative thinking strategies (divergent thinking) to generate a wide range of novel and innovative ideas when designing.
C.5 Use appropriate strategies to record their ideas when designing. This will depend on the specialist fields and the nature of the design and technology activity within that field.
C.6 Use critical thinking skills (convergent thinking) when evaluating design ideas. To use the specification as a means of evaluating their ideas and progress throughout the designing and making of products and systems and use this for evaluation purposes and to inform future designing.
C.7 Use techniques, processes and procedures appropriate for each of the specialist fields to manufacture products and systems.
C.8 When planning and conducting design and technological activities give due regard to Health and Safety of their pupils, themselves and other adults and be aware of current, relevant Health and Safety responsibilities, legislation and liability.
C.9 Develop an understanding of quality when designing and making.
C.10 An awareness of industrial methods and approaches to design, manufacture and quality control on production.
C.11 Have an understanding of citizenship and values and how these relate to Design and Technology (e.g. sustainable design such as recycling materials, designing products with dual functions, GM foods, alternative/renewable energy sources, fair trading).
C.12 Critically use ICT to enhance teaching and learning in Design and Technology using modern technologies.
C.13 Understand the historical and current rationale for Design and Technology education within the curriculum, across primary and secondary phases and including links with other subjects.
C.14 Understand the contribution Design and Technology makes to pupils numeracy, literacy and language development including technical language when talking and writing about designing and making.
C15 Nurture a creative teaching and learning environment where pupils feel confident and safe to experiment, explore and take risks.

Design & Technology Subject Knowledge Audit

Now look over the next 4 sections and focus on your two specialist areas. You should look at the Key stage 3 only for your second area and key stage 3 &4 for your first area.

Materials Technology

Key Stage 3	Key Stage 4 and beyond
M.D.3.1 Accurately sketch construction details which show how wood, metal and plastics can be used to make artefacts, including freehand sketching	M.D.4.1 Accurately sketch construction details, using, where appropriate, recognised conventions which show how a wide range of materials might be used to make artefacts
M.D.3.2 Accurately draw construction details using formal drawing techniques, to show how wood, metal and plastics can be used to make artefacts	
M.D.3.3 Make use of modelling techniques to model artefacts made in wood, metal and plastics	M.D.4.3 More complex models can be used to test a technological principle
M.D.3.4 Use fundamental computer solid modelling techniques i.e. extrusion and revolving, to develop and test design ideas	M.D.4.4 Use fundamental computer solid modelling techniques i.e. lofting and sweeping to manufacture from 3D tool paths (e.g. curvilinear shapes)
M.D.3.5 Create simple assemblies of computer generated solid models to confirm the accurate interaction of separate components	M.D.4.5 Create complex assemblies of computer generated solid models to confirm the accurate interaction of separate components
M.D.3.6 Create 3D computer rendered images which clearly show the desired surface qualities	
M.D.3.7 Generate working drawings using CAD, (e.g. cutting lists, dimensioning and appropriate BS conventions)	M.D.4.7 Generate detailed working drawings using CAD, including assembly, parts and sectional views;
M.D.3.8 Access design data, using IT relating to for example the properties of materials, standard sizes, fixings, adhesives and components	
M.D.3.9 Create spreadsheets related to the costing of materials	M.D.4.9 Undertake spreadsheet analysis for costing and simulation of batch production
M.D.3.10 Investigate and disassemble and evaluate a range of manufactured products made from wood, metal and plastics, identifying the processes involved in their production	M.D.4.10 Investigate, disassemble and evaluate a range of products made from resistant materials including modern materials and smart materials
M.D.3.11 Analyse and investigate the manufactured technologies used to make a range of artefacts (e.g. injection moulding, sand casting)	M.D.4.11 Analyse and investigate the advanced manufacturing industrial technologies used to make modern mass produced consumer products
M.D.3.12 Analyse and investigate the visual and other sensory qualities in materials when analysing artefacts (e.g. colour, texture, smell)	M.D.4.12 Analyse and investigate the visual and other sensory principles when analysing artefacts (e.g. balance, harmony, proportion)
M.D.3.13 Show awareness of different cultures and recognise the influences on the development of products	M.D.4.13 Recognise the importance of new technologies, innovations and inventions in the design of consumer products

Design & Technology Subject Knowledge Audit

M.D.3.14 Recognise that there is an environmental consequence when using resistant materials	M.D.4.14 Consider a range of products and evaluate their impact on the environment
M.D.3.15 Consider the impact on society of a range of products	M.D.4.15 Analyse the social consequences of automated mass-production systems
M.D.3.16 Consider how the physiological aspects of ergonomics can influence the design of products	M.D.4.16 Consider how the psychological aspects of ergonomics can influence the design of products
M.M.3.1 Use the properties and working characteristics of wood, metal plastics to meet design requirements	M.M.4.1 Use the properties and working characteristics of a range of resistant materials including smart materials such as thermo chromic film and EL panel
M.M.3.2 Accurately mark out, using appropriate hand tools and take account of critical dimensions and tolerances when using wood, metal and thermoplastics	M.M.4.2 Accurately measure and mark out considering appropriate tolerances when using both precision hand tools and machines, during the manipulation of a wide range of resistant materials
M.M.3.3 Accurately cut and waste, by hand and basic machines (e.g. pillar drill and band saw), wood, metal, and plastics to efficiently achieve appropriate fit and finish	M.M.4.3 Accurately cut and waste, by using machines (e.g. centre lathe, vertical and horizontal milling), wood, metal, plastics to efficiently achieve precision fit and quality finish
M.M.3.4 Accurately deform, form, and fabricate by hand and using basic machines (such as line bender, vacuum former, punch tools and jigs), wood, metal and thermoplastics	M.M.4.4 Accurately deform, form and fabricate using appropriate methods with a range of materials using complex equipment
M.M.3.5 Effectively join wood, metal and thermoplastic using appropriate hand techniques and basic fixing methods (M.M.4.5 Effectively join a range of materials using advanced techniques, complex equipment and appropriate machine
M.M.3.6 make use of CAM prototyping techniques to synthesise and develop design ideas (e.g. rapid prototyping, stereo lithography, laminate assemblies)	M.M.4.6 use CAD/CAM to aid manufacturing (e.g. making jigs for routing, standardised components, mould making for casting or vacuum forming); to achieve appropriate and repeatable quality, ensuring fit, finish and reliable function
M.M.3.7 Consider visual and other sensory qualities of materials to meet design requirements	M.M.4.7 Consider visual and other sensory principles when using materials to meet design requirements
	M.M.4.8 Recognise that systems and control can be integrated with a range of materials to design and make artefacts (e.g. EL panel and textiles, mechanisms and electronics (mechatronics))
M.K.3.1 Consider and analyse the physical and working properties, at a micro level, of common woods, metals and plastics	M.K.4.1 Consider and analyse the physical, chemical and working properties at a micro level of a wider range of woods, metals and plastics and how the micro arrangement of particles and fibres in the material influence macro properties
M.K.3.2 Understand the classification of wood, metal and plastics, according to their micro-structure (e.g. thermoplastics and thermosets)	M.K.4.2 Understand, at a micro level, how materials can be combined and processed to create useful properties (e.g. the principle of composite materials)

Design & Technology Subject Knowledge Audit

M.K.3.3 Understand how the structure of wood, metal and plastics, at a macro level, influence use and effectiveness	
M.K.3.4 Understand and recognise the importance of structural configuration when using wood, metal, plastics (e.g. space frame, monocoque, cantilever)	M.K.4.4 Understand how materials are combined together in a structural way to resist forces (e.g. carbon fibres, Kevlar, and aluminium honeycomb)
M.K.3.5 Understand how wood, metal and plastics resists forces, such as compression, tension, torque and bending	
M.K.3.6 Understand how a wide range of standardised components influence manufactured products	

Food Preparation and Nutrition

Key Stage 3	Key Stage 4 and beyond
F.D.3.1 Understand and use designing strategies to develop food products	F.D.4.1 Use a range of creative thinking strategies to develop original and innovative food products
F.D.3.2 Use a variety of research methods including the internet, newspaper articles, existing surveys, magazines etc	F.D.4.2 Access resources (e.g. books, data bases used by the food industry)
F.D.3.3 Investigate, research and evaluate existing food products including ingredient analysis, nutritional analysis and costing	F.D.4.3 Develop product analysis to make and modify design decisions during product development
F.D.3.4 Use simple sensory analysis techniques when developing food products	F.D.4.4 Use a variety of sensory analysis techniques used in the food industry when developing food products
F.D.3.5 Use appropriate graphic strategies for the generation and communication of design ideas (e.g. annotated sketches, mood boards, concept boards)	F.D.4.5 Use a scanner and a digital camera to develop concepts and communicate and present design ideas (e.g. product development, packaging, product profiling)
F.D.3.6 Use word processing, DTP ICT packages and clipart to communicate and present ideas (e.g. questionnaires, surveys, food labels)	F.D.4.6 Use DTP, painting, 2D CAD ICT packages and graphics packages to produce reports and food packaging
F.D.3.7 Use simple data bases to make design decisions (e.g. product, nutritional & costing)	F.D.4.7 Use a wider range of databases available to the food industry (e.g. CDs, internet sites)
F.D.3.8 Record and analyse results of sensory analysis visually and as text using a variety of methods including tables, charts and spread sheets	F.D.4.8 Use spreadsheets (e.g. to calculate costs, scaling up of recipes, model and modify design ideas)
F.M.3.1 Plan and organise procedures for the preparation, cooking and presentation of food products	F.M.4.1 Understand and apply procedures used in the food manufacturing and retail industries
F.M.3.2 Use a range of basic food preparation techniques and processes. Handling basic food commodities; preparation of baked products	F.M.4.2 Use a wider variety of foods, including, modern 'smart' foods, organic foods and a range of advanced food preparation skills
F.M.3.3 Use a range of tools and equipment in a safe and efficient manner	F.M.4.3 Use a wider range of food technology resources and equipment related to industrial practices
F.M.3.4 Select prepared/processed/fresh food products/components for different purposes	F.M.4.4 Widen the range of processes/fresh food products/components used
F.M.3.5 Use the concept of a fair test to evaluate products in response to changes in the food production specification	F.M.4.5 Developed an awareness of the techniques used in the food industry
F.M.3.6 Modify existing products to develop a new specification	F.M.4.6 Investigate the concept of developing a 'blue sky' food product

Design & Technology Subject Knowledge Audit

F.M.3.7 Make food prototypes and products in quantity using a range of techniques to ensure consistency	F.M.4.7 Understand and apply systems and procedures used in the food industry
F.M.3.8 Establish good hygiene and safety practices when working with food (e.g. HACCP)	F.M.4.8 Understand the legislative framework related to the development, production and sale of food products
F.M.3.9 Have, as a basic minimum, the Basic Food Hygiene Certificate	
F.M.3.10 Have gained the DATA certification for Health and Safety for secondary teachers in the core and in food technology	
F.K.3.1 Understand and apply the influences of the consumer on food product development	F.K.4.1 Apply knowledge of the influences of advertising and marketing on the design and retailing of food products
F.K.3.2 Understanding about the main nutrients	F.K.4.2 Have a detailed knowledge of these nutrients and their effect on health
F.K.3.3 Have an understanding of the current dietary requirements of different user groups (e.g. teenagers, vegetarians)	F.K.4.3 Have knowledge of the use of DRVs to meet specific nutritional specifications
F.K.3.4 Understand that ingredients can be classified according to their physical and working properties and working characteristics (e.g. a gel, a sol, a temporary or permanent emulsion, a foam, a colloid)	F.K.4.4 Understand the structural and performance characteristics of foods and their role in food products and the implications for the choice of preparation and cooking techniques (e.g. protein - coagulation, carbohydrates - gelatinisation and dextrinisation, and fats-hydrogenisation)
F.K.3.5 Combine ingredients and ready-made food components accurately and effectively to create a food product;	F.K.4.5 Carry out detailed food investigations (e.g. on thickening agents, raising agents, yeast mixtures, modified starches, emulsions, foams, methods of tenderising meat) to help make design decisions
F.K.3.6 Consider the effects of preparation and cooking on food products (e.g. creaming, all-in one, rubbing-in, melting methods, sauce making, baking, frying, steaming, roasting and grilling)	F.K.4.6 Understand the implications of the use in commercial food preparation and processing techniques of food products such as 'smart' and modern foods, modified starch
F.K.3.7 Use a range of food preservation techniques (e.g. jam making, freezing, pickling, dehydration)	F.K.4.7 Have an understanding of food preservation techniques used in the food industry
F.K.3.8 Have an understanding of the use of additives in food production (e.g. flavours, colours)	F.K.4.8 Consider the role of additives in food manufacture (e.g. emulsifiers, stabilisers, antioxidants)
F.K.3.9 Know what packaging materials are available and understand the limitations/ benefits of materials	F.K.4.9 Have knowledge of materials used in the food industry
F.K.3.10 Be able to use a range of small hand and electrical equipment when preparing food products	F.K.4.10 Be aware of and understand the use of large scale equipment in the food industry (e.g. blast freezers)
F.K.3.11 Have an understanding of how to scale up of ingredients for mass production (e.g. batch production)	F.K.4.11 Have an understanding of food manufacturing systems (e.g. batch, continual flow)
F.K.3.12 Understand the terms Quality control and Quality assurance	F.K.4.12 Have an understanding of the roles of professionals and agencies concerned with food safety
F.K.3.13 Have an understanding of systems and control in the context of food production process	F.K.4.13 Understand systems and controls used by the food industry (e.g. manufacturing processes)
F.K.3.14 Understand the concept of HACCP in food production (e.g. risk assessment, critical points)	F.K.4.14 Be able to apply HACCP when developing food products
F.K.3.15 Have an understanding of energy transfer, (conduction, convection and radiation)	F.K.4.15 Have an understanding of energy conservation and efficiency in the preparation and manufacture of food products
F.K.3.16 Have knowledge of correct storage of food in a domestic situation	F.K.4.16 Have knowledge of correct storage of food in the food industry (e.g. dry goods, high risk foods)

Design & Technology Subject Knowledge Audit

F.K.3.17 Have an understanding of the causes and prevention of food poisoning	
	F.K.4.18 Have knowledge of the food legislation relating to the manufacturing and sale of food products
F.K.3.19 Be aware of the effects of social, cultural, economic and environmental factors on food choice (e.g. health, religion, cost, life style, availability and 'non - renewable')	F.K.4.19 Understand the political, ethical, social and cultural influences on the design, production and sale of food products, and the effects of chemicals on humans and the environment, (e.g. pesticides, CFC's, bleaches)

Textiles Technology

Key Stage 3	Key Stage 4 and beyond
T.D.3.1 Make and adapt simple flat patterns for unstructured clothing and other products	T.D.4.1 Draft and adapt more advanced/ complex flat patterns and use appropriate modelling techniques, i.e. drafting, scale blocks, grading, fitting
T.D.3.2 Make simple paper models	T.D.4.2 Understand how models and patterns are drafted in industry
T.D.3.3 Create simple 3D structures	T.D.4.3 Create complex, appropriately reinforced 3D structures
T.D.3.4 Use textiles in creating shell and frame structures	T.D.4.4 Show greater understanding of creating fabrics (e.g. use of knitting machine)
T.D.3.5 Make simple calico models/ toiles	T.D.4.5 construct toiles
T.D.3.6 Use ICT to explore and create shape, pattern and colour ways	T.D.4.6 Show a wider range of the use of more sophisticated ICT software and hardware for exploring shape, pattern and colour ways
T.D.3.7 Use ICT databases for accessing information for designing and making e.g. fabric properties, fashion, styles	T.D.4.7 how understanding of industrial uses of information technology in producing fibres, yarns and fabrics
T.D.3.8 Use CAD/CAM to enhance fabrics (e.g. embroidery software and hardware, draw and paint packages for stencils, transfer, prints)	T.D.4.8 Use CAD/CAM to assist the designing and making of more advanced products to design and make products
T.D.3.9 Make simple representational and technical drawings - fashion and product	T.D.4.9 Use fashion illustration techniques and technical fashion drawing conventions as used in industry
T.D.3.10 Use small scale commercial design /presentation techniques, (e.g. mood boards, story boards, mind maps, sketching, modelling)	T.D.4.10 Demonstrate a high level of skill in the production of commercial display techniques, (e.g. mood boards, story boards)
T.D.3.11 Use strategies to plan, communicate and execute accurate making (e.g. flow charts, patterns)	T.D.4.11 Produce pattern layouts for different fabric widths

Design & Technology Subject Knowledge Audit

T.M.3.1 Use a range of techniques for adding colour, pattern and texture finishes (e.g. dyeing, printing, embroidering, appliqué)	T.M.4.1 Demonstrate more advanced application of appropriate techniques for adding colour, pattern and texture finishes (e.g. dyeing, printing including ICT, puff binder, embroidering, devore)
T.M.3.2 Use simple tests to identify the properties of fabrics	T.M.4.2 Be aware of and have an understanding industry based fabric structure tests
T.M.3.3 Simulate technical finishes (e.g. waterproofing)	
T.M.3.4 use basic pattern marking conventions (e.g. grain, cutting, fold and stitching lines)	T.M.4.4 use a broader range of pattern marking conventions (e.g. numbered balance marks)
T.M.3.5 make use of construction symbols	T.M.4.5 show understanding of industrial processes (e.g. over locking, flat felling)
T.M.3.6 use fabrication and manipulation techniques (e.g. darts, gussets, inserts, pleats)	T.M.4.6 show understanding of more complex shaping processes (e.g. fully fashioning)
T.M.3.7 use knowledge of fabric construction grain, strain and loads in designing and making	T.M.4.7 show awareness of industrial testing processes, industry standards and tolerances
T.M.3.8 apply simple fastenings (e.g. Velcro)	T.M.4.8 apply a greater range of fastenings
T.M.3.9 Use simple techniques for making and finishing seams	T.M.4.9 Use more complex techniques as appropriate
T.M.3.10 Use simple reinforcing techniques	T.M.4.10 Use more complex reinforcing techniques
T.M.3.11 Make edge finishes - machine hems, swing needle stitches, over lockers	T.M.4.11 Make a greater range of edge finishes (e.g. fully fashioning)
T.M.3.12 Safely and accurately use cutting tools (e.g. scissors, shears)	T.M.4.12 Use a greater range of cutting tools where appropriate (e.g. knives and rotary cutters)
T.M.3.13 Demonstrate safe and accurate use of machines and over lockers	T.M.4.13 Demonstrate safe, advanced/creative use of machine technology, i.e. free machine technology, dedicated embroidery machines, buttonholing
T.M.3.14 Complete the DATA (or other appropriate) certification for Health and Safety for secondary teachers in the core and in textiles technology	
T.K.3.1 Classify fibres, yarns and fabrics	T.K.4.1 Show greater understanding of industrial production of fibres, yarns, fabrics
T.K.3.2 Understand how properties affect choice and use of fibres, yarns, fabrics;	T.K.4.2 Show greater understanding of exploiting properties to create desired effects
T.K.3.3 Know about construction and finishing techniques for fibres, yarns and how such techniques can enhance both technical and aesthetic properties	T.K.4.3 Show greater understanding of industrial processes and technological fabrics and finishing fabrics including use of advances in CAD/CAM

Design & Technology Subject Knowledge Audit

T.K.3.4 Be aware of the properties of, and can use, a range of modern and 'smart' materials	T.K.4.4 Have a wider knowledge and understanding of the properties of, and use of, modern and 'smart' industry based textiles
T.K.3.5 Understand the principles of making in quantity	T.K.4.5 Show understanding of industrial production processes (e.g. quality control and assurance)
T.K.3.6 Understand input, process and output in mechanical, electrical and electronic textiles equipment including CAD/CAM	T.K.4.6 Use individual design work in combination with input, process and output in mechanical, electrical and electronic textiles equipment including CAD/CAM

Electronics Communication Technology

Key Stage 3	Key Stage 4 and beyond
E.D.3.1 Make creative use of commercial electronic modules when designing products in other material areas	
E.D.3.2 Understand and use a systems approach when designing with electronics	E.D.4.2 Develop control systems through the interconnection of a range of kits, components and subsystems
E.D.3.3 Understand and be able to use graphical computer control languages to design control solutions	E.D.4.3 Be able to use control programming languages to develop efficient control solutions
E.D.3.4 Use appropriate computer software to design and model simple electronic circuits using a systems approach	E.D.4.4 Use software to design, model and analyse electronic circuits
E.D.3.5 Design simple mechanical solutions incorporating cams, levers, gears and pulleys	
E.D.3.6 Analyse the design of mechanical, electrical and electronic products in terms of who they have been designed for, the design features that suit them to these users and their technical operation at a systems level	E.D.4.6 Make use of their technical understandings of components and systems to analyse and describe the operation of mechanical, electrical and electronic products
E.D.3.7 Recognise that the development of new technologies creates product design opportunities and be confident in citing examples (e.g. Lithium polymer batteries for smaller mobile phones, MP3 technology)	E.D.4.7 Display an understanding of expected future developments in electronics and communication technologies and convey these clearly (e.g. new consumer products brought about by the 'digital revolution')
E.D.3.8 Produce and interpret, simple circuit diagrams using correct British Standard symbols; produce and interpret, systems diagrams; produce and interpret, flow charts; use simple formulae to communicate principles and concepts	E.D.4.8 Create and interpret system construction and functional information and communicate it by means of circuit diagrams, flowcharts, systems diagrams, truth tables, graphs, tables, appropriate formulae and mechanical diagrams
E.D.3.9 Present, and interpret, data on system, module or component function	E.D.4.9 Use sophisticated data to inform the design of products including mechanical, electrical and electronic elements

Design & Technology Subject Knowledge Audit

E.D.3.10 Develop clear user instructions for control systems	E.D.4.10 Develop appropriate user interfaces for control systems
	E.D.4.11 Creates and interprets clear and precise manufacturing information for control systems.
E.M.3.1 Systematically construct and test simple circuits using strip board and/or printed circuit board	E.M.4.1 Model and test system building blocks making effective use of system modelling techniques
E.M.3.2 Use a computer and interface box, or microcontroller module, with appropriate electronic sensors and actuators	E.M.4.2 Understand how computers, microcontrollers and electronic circuits can be used to control a range of actuators
E.M.3.3 Use appropriate computer software to design and make printed circuit boards (PCBs)	E.M.4.3 Use software to support the design of PCBs that are well matched to product casing and take into account the need for circuit testing
E.M.3.4 Prototype simple mechanical solutions incorporating cams, levers, gears and pulleys using both made and bought elements	
E.M.3.5 Analyse the manufacture of a range of mechanical, electrical and electronic products in terms of how the manufacturing processes and materials enable production at an appropriate	E.M.4.5 Describe the advanced manufacturing industrial technologies used to manufacture modern mass produced consumer electronic products (e.g. surface mounting techniques, automated assembly)
E.M.3.6 Use systems based understanding to check the operation of a manufactured circuit	E.M.4.6 Analyse the performance of systems in order to check that they are working effectively, using a range of appropriate test equipment (e.g. multi meter, logic probe, oscilloscope)
E.K.3.1 Understand that mechanical, electrical and electronic systems can be interconnected to achieve different purposes	E.K.4.1 Understand the requirements for interfacing between subsystems as well as to sensors and actuators (e.g. signal matching, simple analogue to digital conversion)
E.K.3.2 Describe feedback as a signal loop in a system diagram and understand how it is used in control systems to ensure that operations are achieved successfully	E.K.4.2 Use systems diagrams and flowcharts appropriately to describe the operation of continuous and sequential control systems
E.K.3.3 Understand the use of potential divider circuits with sensors and use them in switching circuits	E.K.4.3 Understand the operation of a wide range of sensors and actuators and use this knowledge to make considered judgements in selecting appropriate components for a design situation; understand the principles of use of an appropriate range of electrical and electronic components including integrated circuits (ICs)
E.K.3.4 Understand that data can be transferred across a distance both with and without wires	E.K.4.4 Understand the principles of use of a range of techniques for transferring data between control systems separated by a distance (e.g. infra red)

Design & Technology Subject Knowledge Audit

E.K.3.5 Use programming software to control simple products	E.K.4.5 Use programming software to produce sophisticated systems that are able to control and respond to a wide range of external devices
E.K.3.6 Use programming software to program a microcontroller for simple stand-alone control	E.K.4.6 Incorporate programmable devices into control solutions (e.g. PIC based microcontrollers)
E.K.3.7 Use truth tables to describe and solve simple logic problems	E.K.4.7 Use truth tables to analyse and design logic systems
E.K.3.8 Understand the use of resistors and determine their values using the colour code; understand the basic units of electricity and use the resistance equation to calculate current, voltage and resistance within a variety of circuits	E.K.4.8 Use appropriate equations to support the design and analysis of electrical, electronic and mechanical control systems (e.g. formulae for power, potential dividers, amplifier gain, simple and compound gear systems, pulleys, levers)
E.K.3.9 Appreciate the need for and requirements of structures in the construction of mechanical and electromechanical systems	
E.K.3.10 Describe a range of simple mechanical devices and drive systems. Describe the forms of mechanical movement and the use of mechanisms	E.K.4.10 Understand the principles of use of an appropriate range of mechanisms, including considerations of power transfer
E.K.3.11 Discuss the social and environmental consequence of using new technologies	E.K.4.11 Describe the social and environmental impacts of a range of products and manufacturing systems (e.g. improved mass communication)
	E.K.4.12 Apply appropriate technical principles and concepts in the analysis of the function of a range of mechanical, electrical and electronic products