

Year Group 7

All groups organised on a rota system and work can be split over several terms

	Term	1	2	3	4	5	6
	Topic Title	Chocolate Box	Electronic Mood Light	Electronic Mood Light	Balancing Toy	Balancing Toy	Graphical Design
Why are you delivering this topic now? How does it fit with the learning journey?	Rationale	Assess design and practical capabilities of all pupils from a wide range of primary schools. Foster an interest in the design process to enable pupils to produce a range of ideas and to be able to take these ideas to the manufacture stage.	Introduction to electronics using PCBs. Develop programmings skills learnt from KS2, transfer these from virtual programming into a physical upload onto a PIC.	Introduction to electronics using PCBs. Develop programmings skills learnt from KS2, transfer these from virtual programming into a physical upload onto a PIC.	Extend Health & Safety knowledge. Develop research & analysis skills and modelling skills from KS2. Introduction to practical tasks within a workshop environment.	Extend Health & Safety knowledge. Develop research & analysis skills and modelling skills from KS2. Introduction to practical tasks within a workshop environment.	Introduction to 3D sketching using traditional drawing equipment. Develop pupils knowledge of designing in three dimensions using online CAD packages.
What have pupils already covered that will support?	Prior knowledge	KS2 coverage of D&T knowledge is variable across our feeder schools. Although the NC will have been delivered, the depth of knowledge is variable from school to school. Majority of pupils are familiar with the design process.	Majority of pupils will have experienced basic electronic circuits, variable knowledge of programming systems. Design process to generate ideas.	Majority of pupils will have experienced basic electronic circuits, variable knowledge of programming systems. Design process to generate ideas.	Basic use of hand tools covered through practical activities at KS2, although no use of specialist equipment is assumed.	Basic use of hand tools covered through practical activities at KS2, although no use of specialist equipment is assumed.	Use of basic equipment, pencils, rulers, crayons. Some knowledge of 3D sketching is assumed.
	Key knowledge/skills development	Design process to include variety within designs, developing ideas to a suitable solution. Manufacturing a chosen solution using appropriate modelling tools and equipment.	Introduction to key electronic components; how to assemble a PCB using soldering process; Knowledge of relevant health & safety factors; Programming using CAD software	Introduction to key electronic components; how to assemble a PCB using soldering process; Knowledge of relevant health & safety factors; Programming using CAD software	Knowledge of relevant health & safety factors; Use of workshop hand tools and machines relevant to the task. Ability to follow a plan of manufacture to a suitable tolerance.	Knowledge of relevant health & safety factors; Use of workshop hand tools and machines relevant to the task. Ability to follow a plan of manufacture to a suitable tolerance.	Understanding of graphical communication techniques, isometric and orthographic. Transferring sketching skills to a 3D CAD environment.
	National Curriculum/specification links	Design: 1, 2, 3, 4, 5 Make: 1 Evaluate: 3 Technical Knowledge: 1	Design: 1, 2, 4, 5 Make: 1, 2 Evaluate: 2, 3 Technical Knowledge: 1, 3, 4	Design: 1, 2, 4, 5 Make: 1, 2 Evaluate: 2, 3 Technical Knowledge: 1, 3, 4	Design: 1, 2, 4, 5 Make: 1, 2 Evaluate: 3 Technical Knowledge: 1, 2	Design: 1, 2, 4, 5 Make: 1, 2 Evaluate: 3 Technical Knowledge: 1, 2	Design: 4, 5 Evaluate: 1, 2
	Literacy	Pupils are encouraged to use key terminology within their work and when communicating verbally. Pupils are encouraged to proofread their work and	Pupils are encouraged to use key terminology within their work and when communicating verbally.	Pupils are encouraged to use key terminology within their work and when communicating verbally.	Pupils are encouraged to use key terminology within their work and when communicating verbally.	Pupils are encouraged to use key terminology within their work and when communicating verbally.	Pupils are encouraged to use key terminology within their work and when communicating verbally.
	Numeracy	Use of ICT to research potential images for theme, Use of ICT to design an initial idea. Using a net to transpose their ideas on.	Use of resistor colour codes to convert into Ohms; description of resistance using suffixes of Kilo, Mega.	Measurement skills when constructing. Use of metric SI units (mm).	Measurement skills while designing basic ideas.	Measurement skills whilst creating practical work. Evaluation of designed vs practical measurements.	Use of angles for oblique, isometric & orthographic projections.
	STEM	Consideration of cost of materials. Communication- Nets are produced with a laser cutter, resarch into it's use could take place. Analytical-Consideration of impact of use of materails/ end	Investigation of design ideas and suitable presentation along with associated analysis of ideas.	Materials investigation for casing materials; recycling of materials; end of life; sustainability.	Equilibrium analysis, centre of gravity investigation.	Equilibrium analysis, centre of gravity investigation.	Engineering - use of oblique/orthographic/isometric/perspective drawing conventions.
What other curriculum areas/skills does the topic link with? When are these taught?	Cross curricular links	Maths, measuring and working to specific sizes. English, Key words and terms. Art, drawing in different perceptive, tone shading and colour application	Maths, measuring and working to specific sizes. English, Key words and terms. Science, electronic components, how a circuit works etc.	Maths, measuring and working to specific sizes. English, Key words and terms. Science, electronic components, how a circuit works etc.	Maths, measuring and working to specific sizes. English, Key words and terms. Science, balance, forces, fulcrum, equilibrium	Maths, measuring and working to specific sizes. English, Key words and terms. Science, balance, forces, fulcrum, equilibrium	Art, drawing in different perpectives. Maths, measuring and working to specific sizes. English, Key words and terms.
	Key vocabulary	Design, ideas, development, evaluation, font, typography, shading, contrast, complimentary, ACCESS FM	Electronic components (resistor, LED, voltage regulator, PIC). Tool names (vacuum forming, profile cutter, abrasive paper, laser cutter). Materials (acrylic, HDPE).	Electronic components (resistor, LED, voltage regulator, PIC). Tool names (vacuum forming, profile cutter, abrasive paper, laser cutter). Materials (acrylic, HDPE).	Tool names (tenon saw, bench hook, pillar drill, hacksaw, steel ruler)	Tool names (tenon saw, bench hook, pillar drill, hacksaw, steel ruler)	Isometric, orthographic, workplane, sketch, extrusion, cut, join

Year Group 8

	Term	1	2	3	4	5	6
	Topic Title	Steady Hand Game	Steady Hand Game	Headphone Wrap	Year 8 Assessment	Mug Project	Mug Project
Why are you delivering this topic now? How does it fit with the learning journey?	Rationale	Developing practical skills from year 7. Introduction to wood work. Further development of materials and techniques used in CDT.	Developing practical skills from year 7. Introduction to wood work. Further development of materials and techniques used in CDT. That can be transferred to KS4 curriculum.	Develop Health & Safety in cdt knowledge, to further develop research & analysis skills and CAD modelling skills. That can be transferred to KS4 Curriculum.	Fits in with whole school Year 8 assessment period.	To utilise design and CAD skills learnt during the year. To further develop cad skills that can be transferred to KS4 curriculum.	To utilise design and CAD skills learnt during the year. To further develop cad skills that can be transferred to KS4 curriculum.
What have pupils already covered that will support?	Prior knowledge	Balancer in year 7, introduced pupils to practical work and materials (metals) Year 7 mood light, electronics components used to create a working circuit. How to solder.	Balancer in year 7, introduced pupils to practical work and materials (metals) Year 7 mood light, electronics components used to create a working circuit. How to solder.	Pupils have developed H&S knowledge through practical topics term 1 & 2 and in year 7. Pupils have done basic researching and analysing skills in year 7, chocolate box. Have used CAD Modelling skills in year 7 mood light.	Pupils use the skills learnt during the headphone wrap topic to research and analyse products. Use drawing skills learnt in SHG to draw item in 3d.	Have used basic cad modelling skills in y7 mood light, and developed drawing skills further in Y8 headphone wrap	Have used basic cad modelling skills in y7 mood light, and developed drawing skills further in Y8 headphone wrap
	Key knowledge/skills development	Wood properties, Joining methods for wood. Practical woodworking skills, Electronics, developing soldering skills, developing electronic component	Wood properties, Joining methods for wood. Practical woodworking skills, Electronics, developing soldering skills, developing electronic component	Research and analysis skills developed. CAD Modelling skills developed.	To work independently to complete an assessment piece.	To expand CAD designing and professional packaging requirements. To learn to use professional packaging techniques through laser cutter and sublimation printing of mug ideas.	To expand CAD designing and professional packaging requirements. To learn to use professional packaging techniques through laser cutter and sublimation printing of mug ideas.
	National Curriculum/specification links	Design: 5 Make: 1,2	Make: 2 EVALUATE: 2, 3 Tech Knowledge: 1, 3,4	Design: 1, 2, 3,4, 5, Make:1 EVALUATE: 1, 2, 3, 4	Design: 1, 5 EVALUATE : 1,2, 3, 4 Tech Knowledge: 1	Design: 1, 2,4,5 EVALUATE: 2,4	Make: 1, 2
	Literacy	Pupils encouraged to think creatively whilst designing backdrops to games, use of alliteration when creating design ideas.	Practical activity - correct usage of technical vocabulary - names of tools & equipment.	Use of appropriate terminology, designing for others - taking the views of others into consideration by use of question writing.	Pupils are encouraged to use key terminology within their work and when communicating verbally. Pupils are encouraged to proofread their work and complete spelling corrections in the chart provided. Pupils will access a range of reading materials and activities using literacy e.g. Naming of design factors from ACCESS FM.	Use of key terminology, linking with professional packaging words.	Practical activity - correct usage of technical vocabulary - names of tools & equipment.
	Numeracy	Currency values when designing cost of a product; use of cutting lists to ascertain length/widths of materials prior to measuring and cutting.	Measuring skills, quantity of materials	Interpolation between physical paper designs and 2D CAD designs. Measurements of design ideas.	Assessment of numerical answers from a questionnaire.	Nets, symmetry of design	
	STEM	Material properties and comparisons.	Problem solving during practical work, use of tools and processes correctly.	Investigation of design ideas using ACCESS FM, designing for others. Use of 2.5D manufacturing equipment.	Technology - analysing professional designs; recycling; ethical design.	Technology - professional packaging designs, design process, investigation & evaluation. Sublimation of chemicals	Use of 2.5D manufacturing equipment. Sublimation of printing chemicals through heating cycle.
What other curriculum areas/skills does the topic link with? When are these taught?	Cross curricular links	Maths, measuring and working to specific sizes. English, Key words and terms. Science, electronic components, how a circuit works etc.	Maths, measuring and working to specific sizes. English, Key words and terms. Science, electronic components, how a circuit works etc.	Maths, designing to scale and size limit. ICT development of CAD skills through 2D design.	Art, drawing in different perspective, tone shading and colour application, covered in year 7.	Art, designing and presenting ideas. ICT- developing CAD skills through 2d design.	Art, designing and presenting ideas. ICT- developing CAD skills through 2d design.
	Key vocabulary	Types of woods, (e.g. Mahogany, pine) Types of wood joints, (Finger joint, Lap joint etc.) Electronic components. (Tyristor, Resistor, battery etc.) Woodworking tool names (Marking gauge, Tenon saw, pillar drill)	Types of woods, (e.g. Mahogany, pine) Types of wood joints, (Finger joint, Lap joint etc.) Electronic components. (Tyristor, Resistor, battery etc.) Woodworking tool names (Marking gauge, Tenon saw, pillar drill)	Aesthetics Cost, Customer, Environment, Size, Safety, Function, Materials, manufacture	Perspective, Isometric, Orthographic ACCESS FM Analysis	Sublimation printing, Barcode, laser cutter	Sublimation printing, Barcode, laser cutter

Year Group 9

	Term	1	2	3	4	5	6
	Topic Title	Design & Make	Design & Make	Container Design Assessment Task	Technical Graphics	Electronic Card	Electronic Card
Why are you delivering this topic now? How does it fit with the learning journey?	Rationale	Develop pupils design and research skills and independent learning, that can be transferred to KS4 curriculum.	Develop pupils practical and independent problem solving skills that can be transferred to KS4 curriculum.	Fits in with whole school Year 9 assessment period.	To develop pupils designing and presentation skills. Isometric/orthographic skills. That can be transferred to ks4 curriculum	To further develop design and presentations skills built from previous topics covered over ks3.	To expand pupils electronics knowledge and skills develop soldering skills
What have pupils already covered that will support?	Prior knowledge	Yr. 8 types of woods and joining methods. Researching and designing skills from Y8 Headphone and y8 assessment task,	Yr. 8 types of woods and joining methods. Researching and designing skills from Y8 Headphone and y8 assessment task, Practical skills year 7 balancer & Year 8 she	Researching designing skills from, Yr. 9 Design & make topic. Researching and designing skills from Y8 Headphone and Y8 assessment task.	Year 8 assessment task, Y9 design and make task. Yr9 Assessment task	Researching designing skills from, Yr. 9 Design & make topic. Researching and designing skills from Y8 Headphone and y8 assessment task,	Year 7 mood light & y8 she, electronics components used to create a working circuit. How to solder. How to program a pic
Key knowledge/skills development		Independent problem solving to a brief. Designing and annotation skills.	Independent problem solving in a practical topic. Develop practical wood working skills Develop Health and safety in a practical subject.	To work independently to complete an assessment piece.	Isometric and orthographic designing skills, tone shading and colour application	Researching and designing for a client.	Practical: Circuit work. Soldering, skills developed. Using a computer to programming a PIC Developing health and safety in a practical subject
National Curriculum/specification links		Design:1,2, 3, 4,5 Evaluate: 1, 2, 3, 4	Make:1,2 Evaluate: 3 Tech Knowledge: 1	Design: 1,2, 3, 4,5 Evaluate:1,2, 3, 4 Tech Knowledge: 1	Design: 5	Design:1,2,3,4,5 Evaluate: 3	Make: 1, 2 Evaluate: 2, 3 Tech Knowledge: 1, 3,4
	Literacy	Key terminology - name of processes and equipment. Being able to analyse design ideas using complex sentences. Naming of design factors from ACCESS FM.	Key terminology of tools & equipment.	Pupils are encouraged to use key terminology within their work and when communicating verbally. Pupils are encouraged to proofread their work and complete spelling corrections in the chart provided. Pupils will access a range of reading materials and activities using literacy e.g. Naming of design factors from ACCESS FM.	Key terminology	Poetry, creating card greeting verse.	Key terminology of tools & equipment.
	Numeracy	Measuring, use of units.	Measuring, use of units	-	Angles, isometric, orthographic	-	-
	STEM	Research & independent learning.	Engineering construction techniques & manufacturing tolerances.	Analysis of existing products to enquire how they function; Evaluation of design ideas.	Engineering conventions through graphical communication	Electronic principles, PIC programming. Circuit operation	Electronic principles, PIC programming. Circuit operation
What other curriculum areas/skills does the topic link with? When are these taught?	Cross curricular links	Maths, measuring and working to specific sizes. English, Key words and terms. Art, drawing in different perceptive, tone shading and colour application,	Maths, measuring and working to specific sizes. English, Key words and terms.	Art, drawing in different perceptive, tone shading and colour application, covered in year 7.	Maths, drawing to scale and perspective. Art, drawing in different perceptive, tone shading and colour application, covered in year 7.	Art, drawing in different perceptive, tone shading and colour application, covered in year 7.	English, Key words and terms. Science, electronic components, how a circuit works etc. Computing programming a pic
	Key vocabulary	ACCESS FM Isometric,	Finger Joint, Coping saw, tenon saw. Accuracy	ACCESS FM	Orthographic Isometric, types of lines 3rd angle projection.	Presentation	Computing programming. PIC, Resistor, transistor, soldering etc

Key stage 3

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of domestic and local contexts (for example, the home, health, leisure and culture) and industrial contexts (for example, engineering, manufacturing, construction, food, energy, agriculture (including horticulture) and fashion).

When designing and making, pupils should be taught to:

Design

1. use research and exploration, such as the study of different cultures, to identify and understand user needs
2. identify and solve their own design problems and understand how to reformulate problems given to them
3. develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations
4. use a variety of approaches (for example, biomimicry and user-centred design) to generate creative ideas and avoid stereotypical responses
5. develop and communicate design ideas using annotated sketches, detailed plans, 2D and mathematical modelling, oral and digital presentations

Make

1. select from and use specialist tools, techniques, processes, equipment and machinery (precisely), including computer-aided manufacture
2. select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties

Evaluate

1. analyse the work of past and present professionals and others to develop and broaden their understanding
2. investigate new and emerging technologies
3. test, measure and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups
4. understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists

Technical knowledge

1. understand and use the properties of materials and the performance of structural elements to achieve functioning solutions
2. understand how more advanced mechanical systems used in their products enable changes in movement and force
3. understand how more advanced electrical and electronic systems can be powered and used in their products (for example, circuits with heat, light, sound and movement as inputs and outputs)
4. apply computing and use electronics to embed intelligence in products that respond to inputs (for example, sensors) and control outputs (for example, actuators) using programmable components (for example, microcontrollers)