# Richard Lander School

# Design Technology Curriculum Overview - 7/8/9

BE THE BEST YOU CAN BE

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
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| **Reporting Y7** | CfCs | BfL & LAL | | | BfL & LAL | |
| **Year 7** | **Health and safety instruction**<br>**Jewellery project** - this is the only project in KS3 that covers all aspects of a "design and make task". Students will cover the following skills to a basic level; brief analysis and research, design ideas (learning how to draw in 3d, render, annotate), development, planning, manufacture (one off and batches) and evaluation. **Machines:** Scroll saw. **Material focus:** 3mm MDF, Pewter. **Process:** casting. **Maths link**: percentages, calculating manufacturing costs and adding profits. **Extended writing:** evaluation. | | **Graphics module:** 4x groups rotate through 113 to complete the CAD part module, learning Coreldraw - used in KS4 DT, Engineering and Graphic Design. Introduction to Isometric drawing, surface and tonal rendering.<br>**Trinket box project:** making task with focus on designing and further drawing skills. **Machines:** Linisher and pillar drill. **Material focus:** Plywood, PVA, wooden dowell. **Processes:** changing saw blades | | **Coaster project:** Looking at design in different cultures, themes and trends that take place. Designing and making 4 coasters with a repeating pattern, consideration of colour. **Machines:** Scroll saw, Linisher and pillar drill. **Material focus**: MDF, dowell. **Processes:** changing saw blades, chanigng pillar drill bits | **Curriculum Enrichment Week** |
| **Reporting Y8** | CfCs | BfL & LAL | | | BfL & LAL | |
| **Year 8** | **Health and safety instruction**<br>**Rotation of 3x projects** - To allow all groups to complete the graphics project in 113.<br>**Graphics project:** Endangered species 6 week project where students research and investigate causes why animals become endangered - links to ecological concerns. Culminating in a logo that can be used for branding on promotional items, to promote awareness of endangered or extinct animals.<br>**Skills:** research of endangered species, analysis of logo design, design and development of ideas in CAD (building on coreldraw skills taught in Y7).<br>**Birdfeeder project:** Introduction to Engineering.<br>**Materials:** Aluminium sheet, HIPS **Processes**: reading orthographic drawings, marking out, cold metal forming, vacuum forming, riveting.<br>**Maths link:** Tolerances, measurements.<br>**Clocks:** Development of practical skills using the 3x main workshop machines.<br>**Materials:** 6mm MDF. **Processes:** developing cutting skills, drilling and material finishes. **Literacy:** writing a design specification | | | | **Bug boxes: skills** covered, design ideas drawn in 3d, rendered, planning and development of ideas. Building on skills and competences developed during Y7, students have more scope for customisation. Changing drill bits. **Material:** locally sourced softwood, plus reclaimed materials from previous projects. **Literacy:** consideration of sustainable issues through describing the 6 R's. | **Curriculum Enrichment Week** |
| **Reporting Y9** | CfCs | BfL & LAL | | | BfL & LAL | |
| **Year 9** | Health and safety instruction<br>**Timbers:** Students learn about timber production and their link to Environment and sustainability, understanding how softwoods and hardwoods differ in their rate of growth and ethical choices surrounding them, how manufactured boards are made. **Materials:** Pine, plywood, hard wood off cuts. **Processes:** construction techniques, scroll saw and sanding, laminating, natural timber finishes. | | **Polymers:** Students learn about Polymer production and their impact on the environment, link to Environment and sustainability through teaching around crude oil**,** introduction to iterative design (phone holder), commercial production, classifications of two types of polymer. **Materials:** Acrylic. **Processes:** Strip heater, vacuum forming, injection moulding. **CAD/CAM:** Laser cut models. **Focus of folderwork:** creative design and presentation. | **Systems and Control:** Students solder a nightlight circuit, learing about; PCB production, input - process - output, component symbols and values (links to circuits and electricity in Science KS2 and 3) **Maths link:** Resistor colour codes, tolerances, nets. **Processes:** Soldering, manufacture of net for packaging. | **Pen Pot project:** Focused team working project where students have to produce a batch of pen pots. Also three week **Engine House architecture project**: Community Cohesion and understanding Cornish Heritage | **Curriculum Enrichment Week** |

# Richard Lander School — Design Technology Curriculum Overview - 10/11

BE THE BEST YOU CAN BE

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
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| **Reporting Y10** | CfCs | Bfl. & Grades | CfCs | | | |
| **Year 10 Graphics** | **Introduction to graphic design components** - Students will be working in an exercise book initially to show their understand of the 6 main components. Imagery, typogaphy, line, composition, colour and tone. Students will be leanring how to analyse existing examples of good graphic design and will be experimenting using software. Students will be using Corel Draw, Photoshop and Illustrator. Students will experiment with a range of components to produce varying outcomes including packaging, logos, posters, business cards, etc. | **Project 1, Book cover. Design a book cover with the stimulis of an exisiting title. Design and create font through Calligraphr -** Address assessment objectives 1-4 . AO1 - Develop ideas through sustained and focused investigations informed by contextual and other sources. AO2-Explore and select apprpriate media, materials, techniques and processes. AO3- Recording observations relevant to intentions. AO4-Present a meaningful response that realises intentions and where appropriate makes visual connections | **Project 2, Sustained project 'in the news' look at Social awareness campaigns and explore issues on a global and local scale.** Analyse existing campaigns, look at the work of other designers. Address assessment objectives 1-4 . AO1 - Develop ideas through sustained and focused investigations informed by contextual and other sources. AO2-Explore and select apprpriate media, materials, techniques and processes. AO3- Recording observations relevant to intentions. AO4-Present a meaningful response that realises intentions and where appropriate makes visual connections | | **Project 2, Sustained project 'in the news' explore work of Shepherd Fairey, Candy Chang, Irene Navaldi, Andy Warhol. Experiment with a variety of methods including spray painting, tracing, mark making, etc.** demonstrate through the use of a sketch book. | |
| **Year 10 Engineering** | Health and safety instruction. In term 1 students are introduced to **engineering as a profession**, gaining insight into the nine engineering disciplines, career pathways, and the vital role engineers play in industry. These disciplines serve as a "golden thread," underpinning all learning throughout the course. Students develop core technical drawing skills, progressing from freehand sketching to precise isometric and orthographic drawings, and learn to interpret 2D drawings as 3D forms. These skills are applied practically through the high-precision manufacture of an aluminium and wood pen pot. Students gain hands-on experience in understanding the full manufacturing process, they learn to select and safely use the appropriate tools and equipment for each stage, while developing an awareness of material properties, such as the characteristics and applications of non-ferrous metals. | Students explore **electronic engineering** in practice by soldering components as part of larger assemblies. They develop the ability to interpret and create circuit diagrams, understand electronic components and their symbols, and recognize each component's role within an active circuit. This work is integrated with the manufacture of an aluminium component designed to house the printed circuit board for use in a later project. Students will develop an understanding of how to apply SI units in practical contexts and use engineering equations to calculate power and efficiency. | In Term 2, students will learn and apply key **health and safety legislation** relevant to engineering, including HASAWA (Health and Safety at Work Act), RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations), and MHOR (Manual Handling Operations Regulations). They will understand the correct use of personal protective equipment (PPE) and safe working practices when using workshop tools, machinery, and processes. In addition, students will explore production planning techniques, learning how to implement control measures to manage risks, plan tasks safely, and ensure efficient workflow in engineering projects. | Students will consolidate and apply their **engineering knowledge through a series of practical manufacturing** tasks using a range of industrial machinery and processes. Students use the centre lathe to manufacture a brass spinning top, developing accuracy, precision, and an understanding of turning operations. Students also explore casting processes through the manufacture of an aluminium coat hook. They learn to prepare moulds, safely pour molten metal, and understand the properties and behaviour of aluminium during casting. The component is then further refined using the turret mill, where students develop milling skills and an appreciation of subtractive manufacturing techniques. In addition, students manufacture a balance bob using steel, gaining experience in working with ferrous metals. They are introduced to the brazing hearth and learn how to join components safely and effectively, understanding the principles of heat, filler materials, and joint strength. Across all practical tasks, students reinforce their understanding of material properties and the appropriate selection and safe use of tools, machinery, and processes. These activities strengthen technical competence, problem-solving skills, and confidence in workshop-based engineering practice. | In Term 3, students consolidate **key engineering knowledge through structured recall activities,** addressing misconceptions and strengthening understanding. They develop exam skills by applying knowledge to examination-style questions, including extended 9-mark responses. Students learn how to interpret command words, structure answers effectively, and use technical terminology accurately. A mock examination prepares students for the externally assessed component of the course. Students continue to apply equations confidently in engineering contexts, using calculations to support technical decisions. They further develop technical communication skills through hand-drawn and 3D CAD technical drawings, while exploring the role and applications of CAD in industry. | Students apply knowledge and skills developed throughout the year by **manufacturing multiple components of a lamp assembly**. Working from a parts list and technical drawings, students accurately produce and assemble components to specification. Previously manufactured components and the soldered electronic circuit are integrated into the final assembly, reinforcing understanding of systems working together. Students learn and apply a range of joining methods, selecting appropriate tools, equipment, and processes for each task. Throughout the project, students develop an understanding of the role of the manufacturer, including quality control, accuracy, and adherence to specifications, mirroring real-world engineering practice. |
| **Year 10 Design Technology** | **Health and safety instruction** **CAD CAM Engraved box:** Classification of 3 types of timber, properties and specific types identified, production methods involved from raw to stock form links to ecological concerns, environmental impacts, tools and processes involved when working on CAD. Construction methods: hinges, dowel joints, half lap and comb joint, finishes applied. Student learn theory whilst making the box and create a drawing on corel draw to laser cut onto the lid. | **Iterative design project:** Students research and learn about the work of Philippe Stark, Memphis, James Dyson and Zaha Hadid. Create two small design products, one memphis piece of furniture, one architectural model in the style of Zaha Hadid | **Pizza Cutter -** Students to use understanding of ergonomic and anthropometric data to design and make a pizza cutter for a user with athritis. Accessibility considered, as well as material choices, finishes and practical skills. | | **New project: Solar powered car.** Students to create an aerodynamic car body out of available materials, then use a solar pack to power the car. Cars raced etc. Skills: designing, prototyping, problem solving. Theory: energy generation and storage. | **Flat Pack Rack:** students learn about mass production techniques, CAD/CAM in industry, QC, knock down fittings, JIT production. Card net box produce with lasercutter. **NEA:** Students begin NEA section A. |
| **Reporting Y11** | CfCs & Grades | Rep & Grades | CfCs & Grades | | | |
| **Year 11 Graphics** | **Complete coursework Unit 2 - Project 2, Sustained project 'in the news' explore work of Shepherd Fairey, Candy Chang, Irene Navaldi, Andy Warhol. Experiment with a variety of methods including spray painting, tracing, mark making, etc.** Address assessment objectives 1-4 . AO1 - Develop ideas through sustained and focused investigations informed by contextual and other sources.AO2-Explore and select apprpriate media, materials, techniques and prcesses . AO3- Recording observations relevant to intentions.AO4-Present a meaningful response that realises intentions and where appropriate makes visual connections. | **5 hour mock** | **Hand in coursework from component one. Then: Begin exam project -** 7 starting points delivered to students. Students to fulfil 4 AO's through explorationm experimentation and a final outcome AO1 - Develop ideas through sustained and focused investigations informed by contextual and other sources.AO2-Explore and select apprpriate media, materials, techniques and prcesses . AO3- Recording observations relevant to intentions.AO4-Present a meaningful response that realises intentions and where appropriate makes visual connections. | **EXAM** | Revisit component one, finalising and improving work based on growth and skills experience during component two. | |
| **Year 11 Engineering** | Students start the term **preparing for the NEA**. Students undertake a 'practice' type NEA that covers relevant Assessment objectives. The context can vary and is based on previous NEA tasks. The lessons build on the requirements of the NEA and allow students to understand the format of the NEA and the Assessment objectives. Focus is on A01 Recall knowledge and show understanding, A02 Apply Knowledge and understanding, A04 demonstrate technical skills . Students work within the same time constraints as the NEA and produce a quality, working outcome that can be tested against the design brief requirements. | Students start NEA once it has been issued by NCFE. **The NE**A is followed in the order of the Tasks 1-6 and aligned with the timings given. Students start with Task 1 research and selection of materials and tools/machinery. The areas assessed are Engineering Disciplines, Properties and characteristics of engineering materials and Engineering tools, equipment and machines. Assessment objectives A01, A02 A03. Students follow this by Task 2 Hand drafted Engineering drawings. The content areas assessed are Applied science and maths in engineering, reading engineering drawings and hand drafted drawings. Assessment objectives A01 Recall knowledge and show understanding & A04 demonstrate technical skills. Task 4 Production planning, completes the body of work this term. Content areas assessed are Engineering tools , equipment and machines & production panning techniques with Assessment objectives A02 Apply Knowledge and understanding and A03 Analyse and evaluate Knowledge and understanding. | Students complete **Task 3: CAD** produced engineering drawings. Content areas asssesed are Applied science and maths in engineering , reading engineering drawings and CAD engineering drawings. The assessment objectives are AO1 Recalll knowledge and show understanding, AO4 demonstrate technical skills. Task 3 is completed at this time due to availability of IT and the CAD software. Students complete Task 5 Manufacture of the scale model. The content area assessed is Applied processing skills and techniques. Assessment onjective AO4 demonstrate technical skills.Students also ocontinue independent study with a focus on exam technique. Section D in the engineering exam concentrates on longer written answers and students complete excercises,mark and improve their answers | **Task 6 summative evaluatio**n is completed by students. The model is tested and an evaluation written based on assessment objective AO5: Analyse and evaluatethe demonstartion on relevent skills, techniques and processes. This concludes the NEA. The NEA is signed of and submitted for marking. Revison continues and is broken down into content areas. The content areas of focus at this stage are 1- Engineering disciplines and 2- Applied science and maths. | This is the final half term of the course. **revision focus** is primarily on the content areas 3- Reading engineering drawings 4 - Properties characteristics and selection of engineering materials 5 - Engineering tools equipment and machines 6 - Hand drawn engineering drawings 7 - CAD 8 - Production planning 9 - Applied processing skills and techniques. Revison is a combination of class work, past papers, mini test and review. | **Revision and preperation for exam** Student have started exams at this point. Revision lessons continue until the engineering exam date in May. |

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| **Year 11 Design Technology** | **Health and safety instruction** | **Complete section A and B -analysing the contextual challenge,** identify design possibilities, investigate client needs and wants and factors including economic and social challenges. Students should also use the work of others (past and/or present) to help them form ideas. Based on conclusions from their investigations students will outline design possibilities by producing a design brief and design specification. | **Complete section C - Design Ideas -** Students should explore a range of possible ideas linking to the contextual challenge selected. These design ideas should demonstrate flair and originality and students are encouraged to take risks with their designs. Students may wish to use a variety of techniques to communicate. | **Complete section D - Design Development -** Students will develop and refine design ideas. This may include, formal and informal 2D/3D drawing including CAD, systems and schematic diagrams, models and schedules. Students will develop at least one model, however marks will be awarded for the suitability of the model(s) and not the quantity produced. Students will also select suitable materials and components communicating their decisions throughout the development process. Students are encouraged to reflect on their developed ideas by looking at their requirements; including how their designs meet the design specification. Part of this work will then feed into the development of a manufacturing specification providing sufficient accurate information for third party manufacture, using a range of appropriate methods, such as measured drawings, control programs, circuit diagrams, patterns, cutting or parts lists. | **Complete section E - Realisation** - Students will work with a range of appropriate materials/components to produce prototypes that are accurate and within close tolerances. This will involve using specialist tools and equipment, which may include hand tools, machines or CAM/CNC. The prototypes will be constructed through a range of techniques, which may involve shaping, fabrication, construction and assembly. The prototypes will have suitable finish with functional and aesthetic qualities, where appropriate. Students will be awarded marks for the quality of their prototype(s) and how it addresses the design brief and design specification based on a contextual challenge | **Revision and preperation for examStudent have started exams at this point.** Revision lessons continue until the engineering exam date in May. | |