CORE KNOWLEDGE

What I will know and understand by the end of Year 7.

	This year in D&T, we will be learning	This links to:	Key Vocabulary:
1	**Project 1 – Technical drawing** • How to develop your drawing skills by using techniques used to the design industry. You will learn to use accurate measurement in millimetres. • You will be using isometric drawing skills, one point perspective and two point perspective. • By creating a series of house designs using two point perspective.	• Students learn to use specialist equipment related to Maths. You will practice accurately measuring and marking. • Apply tone and shading, rendering and sketching directly links to Art and Design.	• Rulers • Pair of compass • Accuracy • Precision • Technical Drawing • Rendering • Isometric
2	**Project 1 – Technical drawing and CAD** • Why designers use Computer Aided Design (CAD). By recreating your house design using 3D program, you will be looking at how architects help visualise their designs. **New and Emerging Technologies** • We will be debating issues relating to New and Emerging Technologies and the ethical concerns of using 'open source' technology.	• Specialist equipment related to ICT. CAD will be developed throughout KS3 and 4. • Isometric and 1 and 2 point perspective within must future projects. • KS2 Evaluate • British values – democracy • Catholic life – moral discussions.	• Accuracy • Precision • Rendering • Isometric, • Perspective • Computer Aided Design (CAD), • Sketchup, • Open source
3	**Project 2 Structures and kite building** • How kites fly? Explore what Newton's 1st Law of motion and complete maths questions. • Using your drawing skills from your previous project and draw a box kite design in isometric. You will work in pairs to create a box kite. Using correct measurements and accuracy of construction will be assessed.	• Students will learn about forces relating to Physics and Maths. • Links with KS2 Technical knowledge apply their understanding of how to strengthen, and reinforce complex structures. • Graphics used in Yr 8 Blue Sky Thinking.	• Materials, • Structures, • Laws of Motion, • Forces • Torsion • Acceleration • Components
4	**Project 2 Structures and kite building** • How to develop your making skills tetrahedral kite independently using correct measurements and equipment. • We will investigate why 'Kites not drones' related to different cultures. • You will be creating a plan of making (instructions of how to made your kite). • We will finally test your kite and evaluate against the set criteria.	• Students use some materials used for prototyping KS3 & 4. • KS2 Evaluate their ideas and products against design criteria. Develops in detail throughout KS3 &4.	• Tetrahedral • Scissors • Drones Spars • Sails, • Testing, • Evaluation.
5	**Project 3 Creating a trinket box** • How to follow instructions to create your own trinket box from resistant materials (Pine and hardboard). • You will be using a variety of tools and equipment i.e. Tenon saw, try square. Throughout the project you will learn about the rules of Health and Safety expected.	• Relates to properties of materials within Yr 8 Resistant materials project 'On the Move' and Science. • British values – rule of law, you have a collective responsibility to ensure they contribute to a safe working environment where the use of tools and equipment are involved.	• Lap joints • Tenon saw • Try square, • Steel rule, • Health and safety.
6	**Project 3 Creating a trinket box** • Check your trinket box for faults and correct before applying a finish to improve the look of your product. • You will then develop your skills learnt in Project 1 and create an 'exploded drawing' of your trinket box using 3D program.	• An exploded drawing relates to showing how products are assembled. This will be developed further in year 8 Blue Sky Thinking – Manufacturing Plan. .	• Bench hook • Tolerance • Finish • Visual checks • Computer Aided Design • Push/Pull tool

Target Grade:		AP1:		AP2:		AP3:	

CORE KNOWLEDGE

What I will know and understand by the end of Year 8.

	This year in D&T, we will be learning	This links to:	Key Vocabulary:
1	**Project 1 Blue Sky Thinking** • How nature can inspire creativity in design (biomimicry). • To look at other designer to help inspire your work. We will be looking at Vincent Callebaut who is a Belgian ecological architect. • Why it is important how to identify the needs and wants of you target market. • How to develop drawing ideas in isometric and annotate your design in inform.	• Looking at others designers should be used to help develop unique designs showing innovation and being fit for purpose within D&T KS2, KS3 & KS4. • Catholic life – stewardship and discussing multicultural issues with maturity and respect. Links with Yr 7, 10 & 11 RE.	• Innovation • Unique • Biomimicry • Offbeat • Creativity • Fiction
2	**Project 1 Blue Sky Thinking** • How to create your own Design Brief and Specification • Produce a functioning prototype that could your 'cities in the ocean' problem. • The working and physical properties of materials. • How to create a manufacturing plan showing how you made your prototype. • The importance to comparing your model against your specification.	• KS2 Design use research and develop design criteria to inform the design aimed at particular individuals or groups. Students will develop these skills further within all projects in Yr 9. • British values - Mutual Respect & Tolerance for those of different faiths and beliefs	• Analysis • Specification • Brief • Structure • Creativity • Prototyping
3	**Project 2 Audio Amp** • How circuits work and the different components used in an audio amp. • How to develop skills and 2 point perspective to visualise your case design. • How to create a 'net' for your case that will hold your electronic circuit. Using CAD/CAM. • Create a range of design solutions to decorate your audio amp case.	• Experience of working with electronics related to Science. • Problem solving with different equipment and processes developed from Yr 7 D&T. • Creative design using 2D design software to be used for the laser cutter. CAD, ICT.	• Analysis. • Components • Design • Target market • Aesthetically pleasing
4	**Project 2 Audio Amp** • How to accurately solder your components to your Printed Circuit Board (PCB). • How to use the tools and equipment how they are intended. • How to follow the Health and Safety rules whist using electronics equipment. • How to use a Quality Control flowchart to check your circuit 'works' and fix it if it doesn't.	• Linked to KS2 Technical knowledge understand and use electrical. • **British values** All the children have a collective responsibility to ensure they contribute to a safe working environment where the use of tools and equipment are involved.	• Audio amplifier • Soldering irons • Wire clippers • Needle-nose pliers • Wire strippers • PCB • Flowchart
5	**Project 3 On the Move** • The phenomena of air and wind and how it relates to design and engineering. • Natural resources and source of energy for the human race. • To work as a team to develop design skills to create a product that moves harnessing the power of airflow. Consider Lift, Drag, Gravity and Thrust.	• This relates to engineering and Science. • Relates to Yr Environmental design issues • Link s to yr 7 Kite building and Yr 8 Project 1, 2.	• Forces • Aerodynamics • Friction • Energy • Phenomena • Natural
6	**Project 3 On the Move** • Student can use a variety of materials and techniques to create a variety of prototypes. • Develop your problem solving skills and take risks. You will learn that failure is part of design but resilience is the key to success! Develop skills learnt over Yr 7 and 8. CAD/CAM, Electronics, modelling in compliant or resistant materials.	• Input from science and maths departments (lift and drag, area of circles, π etc.) • Relates to Yr 9 Moving toy – mechanical devices.	• Function • Technique • Engineering • Performance • Solution

Target Grade:		AP1:		AP2:		AP3:	

CORE KNOWLEDGE

What I will know and understand by the end of Year 9.

	This year in D&T, we will be learning	This links to:	Key Vocabulary:
1	**Project 1 Moving Toy** • Material categories • Key names of materials and their properties • Names of common mechanisms and changing direction of force. • Sketching and modelling solutions for a moving toy • Selecting the correct tools and equipment for a range of materials.	• Yr 7 Kite building and Yr 8 On the Move projects. • Types of forces – Science.	• Alloys • Polymers • Textiles • Ductile • Malleable • Corrosion- resistant • Eccentric cam
2	**Project 1 Moving Toy** • To construct a solution to your brief • To work safety following Health and Safety rules of the department • Testing and evaluating effectively. • Using 3D CAD program to visualise our final design. • New and Smart materials.	• Yr 7 & 8 CAD bases projects • KS4 CAD/CAM skills to shape and manufacture a product that can be mass produced. • Links with Art and ICT. • British Values - collective responsibility to ensure a safe working environment where the use of tools and equipment are involved.	• Shape memory alloy • Thermochromics pigments • Photochromic • Hydrochromic • Synthetic fibres • Micro encapualtion • Odour neutraliser
3	**Project 2 Furniture modelling** • Investigate the work of a designer or company • Types of forces • Ways to reinforce materials • Design a seating solution • Collaboration design strategy.	• Yr 7 Kite building and Yr 8 On the Move projects. • Types of forces – Science.	• Tension • Compression • Shear • Bending • Torsion • Lamination • Interfacings
4	**Project 2 Furniture modelling** • Revisit freehand sketching, Isometric, 2D/3D drawing, Annotated drawings • Commercial processes, Tolerance, Quality Control (QC) • Prototype designs which: demonstrate innovation, are functional, consider aesthetics, assess if prototypes are fit for purpose. • Different types of production	• Yr 7 Technical drawing project. • Yr 10 Mini NEA – design ideas. • Links with Art and Design. • Links with Maths. • British values – voting (peer assessment).	• Examine • Disassemble • Client • Conclusion • Batch • Mass • Continuous production
5	**Project 3 Environmental clock** • Using data to understand needs: Fossil fuels, Nuclear power, Renewable energy, Energy storage • Product analysis and evaluation • The six Rs (reduce, refuse, re-use, repair, recycle and rethink) • Ethical debate of environmentally issues.	• KS4 Environmental and social issues. • Links with Science. • British values – democracy. • Catholic life stewardship yr 7 & 10.	• Fossil fuels • Kinetic • Hydro-electric • Carbon Dioxide • Generate • Alkaline • Rechargeable • Tidal • Solar • Biomass • Non-Finite
6	**Project 3 Environmental clock** • Linking to manufacture –ecological issues, life cycle of products • Sketching using 2D and 3D. • Card modelling, shape, fabricate and construct a high quality prototype • Different types of surface treatments and finishes	• KS4 Iteration. • Develop modelling skills for prototypes linked with Blue Sky Thinking project Yr. 8. • Developing drawing and communication for Yr 7 & 8.	• Social Footprint • Disposal • Rethink • Refuse • Repair • Biodegradable • Manufacturing • Pollutants • Ethical Trade initiatives.

Target Grade:		AP1:		AP2:		AP3:	

CORE KNOWLEDGE

What I will know and understand by the end of Year 10.

	This year in D&T, we will be learning	This links to:	Key Vocabulary:
1	**Core Knowledge - technical principles** • Robotics, automation and production in industry • Enterprise and Market pull and technology push • People, society and culture • Renewable and non-renewable resources and ethics • Types of motion • Modern, Smart and Composite materials, Technical Textiles, Material properties	• New and emerging technologies 3.1.1 • Design Strategies 3.3.4 • Communication of design ideas 3.3.5 • Energy generation and storage 3.1.2 • Revisit motion and environmental issues yr 9. • Catholic life – importance human rights.	• Robotics, • Automation • Enterprise • Market pull • Renewable • Oscillating • Reciprocating • Linear • Sustainability • Finite
2	**Practice NEA style project - MP3 docking station/storage** • Primary investigation of material area/s through product analysis • Explore and develop ideas for an MP3 docking station/holder • The six Rs, Ecological issues in design and manufacture, Stock forms. • Designing: sketching, modelling, testing, evaluation of work. • Manufacturing specification/working drawings . Manufacture a prototype. How materials are cut shaped, formed to a tolerance, Tools; equipment; processes	• Materials and their working properties 3.1.6 • Selection of materials or components 3.2.1 • Using and working with materials 3.2.5 • Communication of ideas 3.3.5 • Ecological issues in design and manufacture. Social footpriint • Design Strategies 3.3.4. Tolerances 3.3.8	• Functionality • Aesthetics • Environmental factors • Availability • Cost • Social factors • Ethical factors
3	• Which tools, equipment and processes? • What is Quality control? • How to develop prototypes. • The preparation and application of surface treatments and finishes to prototypes. • Types of forces and reinforcing materials • How to evaluate your design against 'needs and wants of a potential client.	• Sources and origins 3.2.4 • Stock forms types and sizes 3.2.6 • Scales of production 3.2.7 • Specialist techniques and processes 3.2.8 • Material Management 3.3.9 • Specialist techniques and processes 3.2.8 • Forces and stresses 3.2.2	• Prototype • Tolerance • Manufacture • Scaling • Construction • Production • Forces
4	**Practice NEA style project 2 - lighting** • Independent research into a designer or company. A range of sources to strengthen research skills and deepen understanding of chosen focus. Interview client. Collect data for anthropometrics and ergonomics. • Explore and develop creative ideas for a lamp using sketching and modelling techniques. • Write a Design brief and Specification. • Health and safety of workshop, materials and products.	• The work of others 3.3.3 • Design strategies 3.3.4 • Investigation, primary and secondary data 3.3.1 • Communication of design ideas 3.3.5 • Using and working with materials 3.2.5 • Writing Design briefs/Specification in Yrs. 8 & 9.	• Research • Target Market • Components • Performance • Techniques • Features • Quality • Safety • Summarise • Impact
5	• How materials can be altered to change their properties. Redesign your lamp to incorporate different materials. • Scales of production • Commercial processes • How to consider what volume different products are made in and how this changes their design, materials and manufacture.	• Yr 10 & 11 RE - multicultural issues • Using and working with materials 3.2.5 • Scales of production 3.2.7 • Specialist techniques and processes 3.2.8	• Bespoke • Workforce • Repeated • Templates • Jigs • Moulds • Identical • Just In Time. • Assembly line • Quality Assurance • Quality Control • Describe
6	**GCSE NEA project (coursework)** • How to investigate NEA Design Challenge. Investigate using primary and secondary sources. • Create Task analysis, client profile and interview to identify their 'needs' and 'wants'. • Write a Design brief and Specification. • Understanding the design style, philosophy and products of the chosen designer/company.	• Students to work independently using skills learnt during practice NEA projects 1 & 2. • The work of others 3.3.3. Design strategies 3.3.4 • Communication of design ideas 3.3.5 • Investigation, primary, secondary data 3.3.1 • British values Individual liberty - use their own ideas and design choices when making..	• Influenced • Investigating • Examine • Consider • Justify • Questionnaires • Collating data

Target Grade:		AP1:		AP2:		AP3:	

CORE KNOWLEDGE

What I will know and understand by the end of Year 11.

	This year in D&T, we will be learning	This links to:	Key Vocabulary:
1	**GCSE NEA project (coursework)** • Developing drawings of design ideas • Developing your models in response to client feedback • Testing your models against your Specification. • Using CAD to visualise your idea • Using CAM to manufacture parts of your product • How to and what to revise for the PPEs	• Yr 10 Practice NEA projects 1 & 2. • Links with ICT.	• Tolerance • Accuracy • Datum point • Collate • Render • Rescale • Assess
2	• Research of suitable materials and industrial processes • Planning the manufacture of your final prototype • Realising your final prototype using a range of techniques, tools and equipment. • Recording of making of your initial models and final prototype by creating a Diary of Modifications/Testing So other would be able to recreate your product your will create a Manufacturing Specification. • PPE examination revision and test.	• Yr 10 Practice NEA projects 1 & 2. • Links with Science – properties of materials.	• Artefact • Abrasive • Deciduous • Fabrication • Laminating • Wastage • Ferrous • Manufacturing • Anthropometric data
3	• Ensure that your prototype is fully completed. • You will be collect feedback to analyse and evaluate your product. **Preparing for your GCSE exam – Revisit, Recall & Test** • The impact of new and emerging technologies • Enterprise based on the development of an effective business innovation • The impact of resource consumption on the planet • How products are designed and made to avoid having a negative impact on others	• Yr 9 & 10 projects and revision. • You will use GCSEpod for independent home learning. • Catholic life – stewardship RE. • Links with Science	• Analyse • Apply • Compare • Complete • Contrast • Kyoto Protocol • Define
4	• Positive and negative impacts new products have on the environment • Production techniques and systems • Energy generation and storage • Developments in new materials • Systems approach to designing • Mechanical devices • Materials and their working properties	• Yr 9 & 10 projects and revision. • You will use GCSEpod for independent home learning. • Catholic life – stewardship RE. • British values – Rule of Law. • Links with Science.	**Command words** • Give or state • Describe • Explain • Discuss • Evaluate • Calculate
5	**Preparing for your GCSE exam** • Mock testing and past papers • Differentiated resource packs • Various revision styles • Daydream and BBC Bitesize revision apps • GCSEpod videos and Stretch Learning Activities	• KS3 and KS4 D&T subject knowledge • KS5 Design and Technology courses • Creative industries, Design and Engineering career paths.	• Check out the list of keywords in the glossary hand out.
6			

Target Grade:		AP1:		AP2:		AP3:	