**The Nottingham Emmanuel School – Design and TechnologyCurriculum Map (2022-2023)**

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| Intent statement | Design and Technology at Emmanuel School allows students to creatively solve real world problems by applying maths and science. Students use their minds and their hands to apply academic knowledge to practical problem solving tasks. Students will develop their capabilities in critically analysing problems, researching solutions, developing ideas, planning manufacture, and practical skills.  |
| Diversity across the curriculum | The practical aspects of the Design and Technology curriculum allow many different groups of students to excel. The projects students will follow aim to be gender neutral and appeal to students of all socio-economic backgrounds and cultural backgrounds. Projects are adapted to students with varying additional needs.  |
|  |  | AUT 1 | AUT 2 | SPR 1 | SPR 2 | SUM 1 | SUM 2 |
| Year 7 |  | All students will study textiles, food, and product design in rotation during year 7. The subjects may be studied in different terms of the year. |
| Title and objectives | Textiles- Pizza Soft Sculpture | Food- Healthy Eating | Product Design- Desk Tidy |
| Core knowledge | Natural materials/properties of materials/ the importance of textiles/ Basic sewing skills | Healthy eating/ eat well guide/ Government 8 guidelines | Wood and plastic properties/ Health and Safety/ Designing for a specific need |
| Skills | Hand embroidery/Applique/ Designing/ Artist analysis | Chopping and cutting techniques/ Measuring/ Hygiene/ using a cooker and other equipmentPractical work: Fork Biscuits, Fruit salad, Bread, Pitta pizza, Cupcakes, Seasonal practical | CAD/ Cutting wood/ using hand tools and equipment/ Line bending/ Designing  |
| Covid recovery | Starting at a basic level as students’ experiences from primary school will be very different. |
| Careers | Investigating the career and work of Lucy Sparrow | Investigating the healthy eating campaigning of Jamie Oliver | Using design influences form product designers to design for a target market |
| Year 8 |  | All students will study textiles, food, and product design in rotation during year 8. The subjects may be studied in different terms of the year. |
| Title and objectives | Textiles- Sustainable Tote Bag | Food- Diet and Health | Product Design- Speaker |
| Core knowledge | Synthetic materials/ Smart and modern materials/ Using the sewing machine/ Sustainability | Diet and Health/PPE/Cross contamination and food safety  | Basic electronics/ Health and safety/ Tools and equipment / Knowledge of Memphis/ Designing / Knowledge of plastics  |
| Skills | Using sewing machine/ designing/construction techniques/ Analysis | Using the cooker and other equipment/ Adapting a recipe/ Weighing and measuring Practical work: Pizza, Chicken nuggets, Chow mein, Cheese Scones, Free practical | Soldiering and wiring/ Line bending/ Designing |
| Covid recovery | Spaced retrievals of the skills as well as the knowledge to consolidate learning from Year 7 |
| Careers | Investigating the products from Kind bag London. | Investigating the influences and careers of local chefs | Investigating and using Memphis design to influence design work |
| Year 9 |  | All students will study textiles, food, and product design in rotation during year 9. The subjects may be studied in different terms of the year. |
| Title and objectives | Textiles- Portraits | Food- Food from around the world | Product Design- Gravity Racer |
| Core knowledge | In-depth research of artists/ Critically analysing artists/ Creating artwork inspired by an artist  | Different cuisines, cooking dishes commonly associated with the country, cooking techniques, kitchen jobs, history. | Material properties/ Joining a variety of materials/ Health and Safety/ Designing/ Finishing techniques/ Sustainability/ Disciplines of engineering  |
| Skills | Advanced machine skills/ patchwork/ weaving/ fabric layering | Advanced cooking and baking skills/ menu planning/ presentation skills.Practical work: Spaghetti Bolognese, Flapjacks, Pasties, Curry, Presentation practical ( teacake challenge) | Marking, cutting, joining and finishing multi materials |
| Covid recovery | Recap of basic skills/knowledge before introducing advanced skills/knowledge to embed skills/knowledge from Year 7 and Year 8. |
| Careers | Using the work of Victoria Villisana to influence students’ own textiles work | Investigating the work and careers of chefs from different countries/specialisms | Investigating competitive racing and linking with careers in design and development |
| Year 10 Textiles | Title and objectives | Textiles – Surface pattern (mini project) | Textiles- Structures (mini project) | Textiles- Component 1 60% of final grade |
| Core knowledge | Introduction to a range of artists/ Learning how to record ideas through photography/ Sampling with a range of textile techniques/ Designing and making a final outcome  | Introduction to a range of artists/ Learning how to record ideas through photography/ Sampling with a range of textile techniques/ Designing and making a final outcome | Students to respond to a chosen starting point/Students will communicate their ideas through their sampling/Students will evaluate and improve their work as it progresses/ Students will select appropriate media, techniques and processes as they move through their project  |
| Skills | A01- Develop ideas through investigationA02- Refine work by exploring idea, selecting and experimenting A03- Recording ideas, observations and insights | A01- Develop ideas through investigationA02- Refine work by exploring idea, selecting and experimenting A03- Recording ideas, observations and insightsA04- Present a personal and meaningful response | A01- Develop ideas through investigationA02- Refine work by exploring idea, selecting and experimenting A03- Recording ideas, observations and insights |
| Covid recovery | Recap of basic skills/knowledge before introducing advanced skills/knowledge to embed skills/knowledge from Key Stage 3 |
| Careers | Using local artists and links with Nottingham Trent to influence students’ design work. | Using local artists and links with Nottingham Trent to influence students’ design work. | Using local artists and links with Nottingham Trent to influence students’ design work. |
| Year 11 Textiles | Title and objectives | Textiles- Component 1 60% of their final grade | Textiles- Component 1 60% of their final grade | Textiles- Component 2 40% of their final grade |
| Core knowledge | Students to respond to a chosen starting point/Students will communicate their ideas through their sampling/Students will evaluate and improve their work as it progresses/ Students will select appropriate media, techniques and processes as they move through their project | Students will be working on their final outcome that has been inspired by their previous research. | Students to respond to a starting point given by the exam board/Students will communicate their ideas through their sampling/Students will evaluate and improve their work as it progresses/ Students will select appropriate media, techniques and processes as they move through their project |
| Skills | A01- Develop ideas through investigationA02- Refine work by exploring idea, selecting and experimenting A03- Recording ideas, observations and insights | A03- Recording ideas, observations and insightsA04- Present a personal and meaningful response | A01- Develop ideas through investigationA02- Refine work by exploring idea, selecting and experimenting A03- Recording ideas, observations and insights |
| Covid recovery | Recap of basic skills/knowledge before introducing advanced skills/knowledge |
| Careers | Using local artists and links with Nottingham Trent to influence students’ design work. |
| Year 10 Food | Title and objectives | The accommodation Project | The holiday Village project | Nutrients/ age groups/specific needs/nutritional methods NEA INFO |
| Core knowledge | Introduction into the hospitality sector from the accommodation industry looking into the commercial/non-commercial/ different services, job roles and legislations. | This project focuses on holiday parks and how they meets the needs of their customers. We also look at their impact on the economy, laws and documents that should protection employers and employees, food poisoning, flow of a kitchen and kitchen operations. | Students will be taught knowledge around nutrition directed at different ages groups, along with specific needs and how cooking food can impact the nutritional value. This will be in preparation for their NEA. |
| Skills | Practical skills: weighing, measuring, mixing, baking, boiling, chopping | Practical skills: weighing, measuring, mixing, baking, boiling, chopping. | Practical skills: weighing, measuring, mixing, baking, boiling, chopping. |
| Covid recovery | Using spaced retrievals to recap knowledge. Along with revisiting previously learnt knowledge throughout the project. |
| Careers | A visit from the army chef | Visit from a preparation chef on TV | Investigating local business owners |
| Year 11 Food | Title and objectives | NEA Knowledge | Assessed NEA | Assessed NEA |
| Core knowledge | Students will be taught knowledge around a hospitality provision learning about sustainability, menu planning, and dovetailing. This will be in preparation for their NEA | Students to complete their coursework using their own booklet work on computers using given brief. This will result in a practical exam of 2 courses over exam conditions. | Theory knowledge will be revisited and all aspects of knowledge to be refreshed. Different revision techniques will be practised. |
| Skills | Practical skills: weighing, measuring, mixing, baking, boiling, and chopping. Making pasta, filleting fish, deboning chicken, making sauce. | Practical skills: weighing, measuring, mixing, baking, boiling, and chopping. Making pasta, filleting fish, deboning chicken, making sauce. | Practical skills: weighing, measuring, mixing, baking, boiling, and chopping. Making pasta, filleting fish, deboning chicken, making sauce. |
| Covid recovery | Using spaced retrievals to recap knowledge. Along with revisiting previously learnt knowledge throughout the project. |
| Careers | Investigating sustainable food production company and career opportunities. |
| Year 10 Product Design | Title and objectives | USB table lamp | Model Cardboard Chair | Trial NEA | Trial NEA | Assessed NEA |
| Core knowledge | New and emerging technologiesNew materialsMaterials properties | Energy generation and storageMechanical systems | Forces and stressesEnvironmental impactScales of productionSurface finishes | Designing processResearch Developing a design solution | Manufacturing planningManufacturing techniques | Identify, investigate and outline design possibilitiesProducing a design brief and specification |
| Skills | Marking out, cutting, shaping, joining, and finishing a variety of different materials.  | Marking out, cutting, shaping, joining, and finishing a variety of different materials. | Marking out, cutting, shaping, joining, and finishing a variety of different materials. | Working to a specification for a target marketDeveloping design solutions using iterative design | Working safely with a variety of tools and equipment  | Working to a specification for a target marketDeveloping design solutions using iterative design |
| Covid recovery | Ensuring students recall and practice fundamental skills and knowledge before moving on to secure knowledge and skills from Key Stage 3. |
| Careers | Investigating careers linked to STEM subjects |
| Year 11 Product Design | Title and objectives | Assessed NEA | Assessed NEA | Assessed NEA | Exam revision |
| Core knowledge | Generating design ideas:ResearchInitial designsEvaluation of designs | Generating design ideas:ResearchInitial designsEvaluation of designsDeveloping design ideas:ModellingCAD / CAMSelecting materialsDrawing techniques | Realising design ideas:Working with a range of materials, tools, and processesQuality controlSustainabilityAnalysing and evaluating:Customer testing and feedbackEvaluation to the specificationSuggested improvements | New and emerging technologiesEnergy generation and storageDevelopments in new materialsSystems approach to designingMechanical devicesMaterials and their working propertiesSelection of materials and componentsForces and StressesEcological and social footprintSources and origins of materialsUsing and working with materialsStock formsScales of productionSpecialist techniques and processesSurface treatments and finishes |
| Skills | Working to a specification for a target marketDeveloping design solutions using iterative design | Using the iterative design process to develop design ideas | Manufacturing skills in a wide variety of materials | Design and making principlesEnvironment, social and economic challengeThe work of other designersDesign strategiesCommunication of design ideasPrototype developmentSelection of materials and componentsTolerancesCutting materials efficiently to minimise wasteSpecialist tools and equipmentSpecialist tools and processes |
| Covid recovery | Using spaced retrievals to recap knowledge. Along with revisiting previously learnt knowledge throughout the project. |
| Careers | Investigating careers linked to STEM subjects |
| Year 10 Construction | Title and objectives | Construction- Unit 1+ Unit 3 Practical skills | Unit 1+ Unit 3 Practical skills | Unit 1+ Unit 3 Practical skills | Unit 1+ Unit 2 Practical skills | Unit 1 + Unit 3 Practical skills | Unit 3 Practical + coursework |
| Core knowledge | Unit 3 tiling practical skillsUnit 1 (1.1) Buildings and structures Unit 1 (1.2) Infrastructure and civil engineering products Unit 1 (1.3) Building services engineeringUnit 1 (1.4) Professions and managerial roles and responsibilities associated with the built environment sector  | Unit 3 tiling practical skills1.2 the built environment life cycle raw material extraction manufacturing construction operation and maintenance demolition disposal, reuse or recycling | Unit 3 Bricklaying practical skills1.3 types of building and structure different forms of infrastructure construction low-rise: • residential dwellings • commercial buildings • industrial buildings • agricultural buildings • community buildings • religious buildings • recreational buildings. | Unit 3 bricklaying practical skills1.4 technologies and materials main elements and components of low-rise buildings • main materials involved in constructing walls, installing building services, fitting roofs and finishing interiors • renewable technologies and materials, including heat pumps, wind turbines and solar panels. | Unit 3 woodwork practical skills1.5 building structures and formsCellular constructions • rectangular frame constructions• portal frame constructions • heritage and traditional methods. | Unit 3 woodwork practical skills1.6 sustainable construction methods the environmental, financial, cultural and social benefits of sustainable construction methods • pollution and the preservation of the natural environment and natural habitats • sustainable materials used to create building frames, walls, roofs • waste disposal, re-use and recycling • planning permission, brownfield sites and greenfield sites. |
| Skills | Wall tiling Bridges, roads, residential and non-residentialRoads, railways, bridges, tunnels etc…mechanical services- escalators, lifts, heating and ventilationdesigner/architect. Civil/structural engineering, contracts manager and site manager, surveyor, quantity surveyor  | Wall tilingoil and gas forestry quarrying miningTimberEngineered wood productsSteel, copper, plastic. | Bricklayingcovers a range of functions such as roads, motorways, services such as electrical distribution, harbour works, rail cycle paths, bridges and tramways | Bricklaying Technologies- solar energy, wind turbines, heat pumps, waterFinishes- external walls, internal walls, floors, secondary structures, roof finishes, internal finishes  | Bricklaying • load bearing walls provide the main vertical support and lateral stability for floors • external wall panels, lift shafts or staircases are used to provide stability • bridging components such as floors, roofs and beams are supported by load bearing walls | Woodwork Waste disposal- includes the classification of waste materials: hazardous, non-hazardous, origin, properties. The costs of landfill: financial, environmental and social • Re-use- salvaged construction products are re-used with little or no reprocessing, typically: bricks, slates, steel sections. The environmental impact of reprocessing is minimised • Recycling- processes typically include crushing, smelting, decontamination, sorting. There are a wide variety of potential end uses of recycled concrete, wood, metals, glass and plastic. |
| Covid recovery | Recap of basic skills/knowledge before introducing advanced skills/knowledge |
| Careers | Trip to a local site- Health and safety | Local site manager to speak to students |  | Site team to speak about what they do on a day to day basis | Bricklayer to speak to students about their career path | Investigation about career opportunities in site management |
| Year 11 Construction | Title and objectives | ConstructionUnit 2- practical skills | ConstructionUnit 2- practical skillsUnit 3 written exam | ConstructionUnit 2- practical skillsUnit 3 written exam | ConstructionUnit 3 written exam | ConstructionUnit 3 written exam |  |
| Core knowledge | Unit 2- practical skills tiling What is tilingDifferent types of tiling Prepping the surface Tiling- Practical  | Unit 2- practical skills tiling* Start tiling coursework

Unit 3- written exam prepAC1.1 Describe activities of those involved in construction projectsAC1.2 Describe responsibilities of those involved in construction projectsAC1.3 Describe outputs of those involved in realising construction projectsAC2.1 Describe processes used in built environment development projects | Unit 2- practical skills wiring* Start wiring coursework

Unit 3- written exam prepAC2.1 Describe processes used in built environment development projects- Construction: **Maintenance**AC2.2 Calculate resources to meet requirements for built environment development projects | Unit 3- written exam prepCoursework completedAC2.3 Assess potential effect of factors on project success**Factors**:* **Internal** e.g. lack of qualified and certified key personnel, sourcing of finance, security
* **External** e.g. penalty clauses, weather conditions
 | Unit 3 written exam prepAC2.4 Interpret sources of informationAC3.1 Sequence processes to be followedAC3.2 Apportion time to processes |  |
| Skills | Different types of tilingTools and equipment Tiles | Construction projectOutputs in construction projectsprocesses | Unit 3- secure site, site clearance, substructure, superstructure | Internal and external factors Finance and security  | Primary and secondary sources Project breakdown |  |
| Covid recovery | Recap of basic skills/knowledge before introducing advanced skills/knowledge |
| Careers | Local tiling company to come into school to talk about career opportunities | Electrician to come into school to talk about career opportunities | Site manager to come into school to talk about career opportunities |  |