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| National Curriculum DT - Purpose of study  Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others’ needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation. |
| Aims  The national curriculum for DT aims to ensure that all pupils:   * to be able to create a product for a person, for a purpose and create high quality products * develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world * build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users * critique, evaluate and test their ideas and products and the work of others * understand and apply the principles of nutrition and learn how to cook. |
| EYFS – see Development Matters 2021 for detailed examples of how to support learning in EYFS  Expressive Arts and Design The development of children’s artistic and cultural awareness supports their imagination and creativity. It is important that children have regular opportunities to engage with the arts, enabling them to explore and play with a wide range of media and materials. The quality and variety of what children see, hear and participate in is crucial for developing their understanding, self-expression, vocabulary and ability to communicate through the arts. The frequency, repetition and depth of their experiences are fundamental to their progress in interpreting and appreciating what they hear, respond to and observe. |

**Intent**

At Eccleston Primary School, Design Technology is an inspiring, rigorous and practical subject. We want our pupils to understand the benefits of imagination, taking risks and collaboration. Children are encouraged to solve real life and relevant problems within a variety of contexts. We aim to give children skills for life which can help them with future studies. We want our pupils to instil qualities such as curiosity, enquiry and determination. Pupils are inspired, engaged and excited through carrying out a range of effective research and design tasks prior to production of products. Students thrive in learning how to work both independently and collaboratively to gain an in-depth understanding of the creative and problem-solving process. After creating a tangible product, this fills the pupils with the sense of achievement, pride, and boosts self-esteem.

**Implementation**

At Eccleston Primary School, Design Technology is taught each term discretely and where links can be made, will fit thematically with other foundation subjects. Our curriculum offers a range of exciting units that solve real and relevant problems. Through these units, the curriculum is taught through concepts that underpin the subject. There are four concepts in the Design Technology curriculum: **Technical Knowledge, Practical Knowledge, Design Inspiration** and **Design Process.** These four concepts are taught alongside **Vocabulary** which connects all concepts and knowledge, strengthening our Design Technology curriculum.

**Technical Knowledge:**

Technical knowledge involves knowing about the technical theories that underpin design. This helps designers to imagine products that, in the real world, will do what they intended them to do. For example, knowing about the theory of triangulation allows designers to create structures that are strong and stable; knowing about the theory of electrical systems allows them to produce workable products. Technical knowledge also includes learning about design challenges, such as how best to join materials. Without knowing, for example, that scoring card before folding makes for a cleaner fold, one cannot fully realise one’s designs. Technical knowledge is distinct from practical knowledge in that it is focused on theory; practical knowledge is based on one’s ability to apply theory successfully.

**Practical Knowledge:**

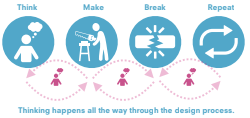
Practical knowledge involves applying technical knowledge to projects. It requires practice and a degree of what this book calls ‘finger fluency’: in much the same way as a fluent reader requires automatic recall of phonic knowledge, designers need automatic recall of technical and practical knowledge to successfully realise their designs. Without practical competence, pupils will struggle to understand the limitations of their designs and, therefore, be more likely to produce unrealistic design proposals. For example, if pupils know, and are fluent in applying, how to cut and join square-section wood when forming a truss then their bridge designs will reflect this practical knowledge.

**Design Inspiration:**

Design and technology is primarily concerned with making useful inventions that have a purpose and intended users (as opposed to art which is primarily a form of expression through media).

**Design Process:**

Design is an iterative process. The word ‘iterate’ means to repeat (‘re-iterate' means to repeat what has been repeated). This is an important part of the discipline of design. This Curriculum Companion for DT aims to model to pupils the design process through guided designs which use the following iterative process: think, make, break, repeat.



The teaching of DT follows a cycle of research, developing own ideas through design, mastering skills, making final products, and evaluating. As the children move through school, they revisit concepts with increasing levels of depth.

***‘****Design Technology is the combination of Art and Science; it is as much a matter of finding problems as it is solving them’. Byran Lawson.*

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|  | **0 – 3 years**  Expressive arts and design – Development Matters | | **3 – 4 years**  Expressive arts and design – Development Matters | | **Reception**  Expressive arts and design – Development Matters | |
|  | **Autumn**  Development Matters   * Notice patterns with strong contrasts and be attracted by patterns resembling the human face. * Start to make marks intentionally.   Key Knowledge   * Use a variety of mark making tools to create marks.   Key vocabulary  pencil pen paint chalk crayon  brush  **Spring**  Development Matters   * Explore paint, using fingers and other parts of their bodies as well as brushes and other tools.   Key Knowledge   * To know they can use their hands and fingers to create marks and pictures.   Key vocabulary  hand finger paint picture  **Summer**  Development Matters   * Explore different materials using all their different senses to investigate them. * Use imagination as they begin to consider what they can do with different materials. * Make simple models with express their ideas   Key knowledge   * To understand they can use materials to build and create spaces * Use loose parts creatively, beginning to understand one thing can represent another.   Key Vocabulary  make, build, model | | **Autumn**  Explore play dough shapes and manipulations  Development Matters   * Explore different materials freely, to develop their ideas about how to use them and what to make.   Key Knowledge   * To be able to pinch, roll, squash and pat playdough * To understand they can manipulate materials to change the shape   Key Vocabulary  pinch, roll, squash, squeeze, pat, change, shape  **Spring**  Join materials, create models  Development Matters   * Develop their own ideas and then decide which materials to use to express them. * Join different materials and explore different textures   Key Knowledge   * To be able to use glue and sellotape to join materials together * To use large loose parts creatively to create pictures and models * To develop creativity in ideas, which materials to select.   Key Vocabulary  join, materials, attach, tools, make, build  **Summer**  Being creative and imaginative  Development matters   * Explore different materials freely and to develop their own ideas about what they want to make. * Join different materials and textures.   Key knowledge   * Develop creativity in the small world area, using loose parts and materials to create models * To use different materials to create African animals, fruit baskets and design African clothes   Key Vocabulary  Ideas, models, create, join, pattern, material | | **Autumn**  Rangoli, Diwali Pattern Making Clay pots for candles  Development Matters   * Uses their increasing knowledge and understanding of tools and materials to explore their interests and enquiries and develop their thinking * Develops their own ideas through experimentation with diverse materials, to express and communicate their discoveries and understanding.   Key knowledge   * To be able to shape a malleable material for a purpose. * To use clay tools to make changes to materials   Key Vocabulary  play dough, clay, tools, roll, pinch  **Spring**  Joining materials, making models, making models that move  Development Matters   * Creates representations of real life objects, people, events and ideas. * Understands their increasing knowledge and understanding of tools and materials to share their interests their enquiries and develop their thinking. * Express and communicate their working theory.   Key knowledge   * To be able to use tools to create changes to materials. * To be able to select and use the correct join. * To be able to select and use materials to make their model move. * To talk about and share their ideas.   Key vocabulary  join, materials, tools, move, together, model,  **Summer**  Work collaboratively, plan, evaluate  Development Matters**:**   * Explore, use and refine a variety of artistic effects to express their ideas and feelings. * Return to and build on their previous learning, refining ideas and developing their ability to represent them. * Create collaboratively, sharing ideas, resources, and skills.   Key knowledge   * Work in a small group * share ideas with others * be able to explain how work can be improved * be able to talk about what went well.   Key Vocabulary  change, improve, better, share, idea | |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Autumn Term 2** | **Slider Mechanisms**  Concepts:  Technical Knowledge  Design Inspiration  Design Process  National Curriculum:  Design  - design purposeful, functional, appealing products for themselves and other users  based on design criteria  - generate, develop, model and communicate their ideas through talking, drawing,  templates, mock-ups and, where appropriate, ICT  Make  - select from and use a range of tools and equipment to perform practical tasks (cutting, shaping and joining)  - select from and use a wide range of materials and components, including construction  materials, according to their characteristics  Evaluate  - evaluate their ideas and products against design criteria  Technical knowledge  - explore and use mechanisms in their products. | **Lever Mechanisms**  Concepts:  Technical Knowledge  Practical Knowledge  Design Inspiration  Design Process  National Curriculum:  **Design**  - design purposeful, functional, appealing products for themselves and other users  based on design criteria  - generate, develop, model and communicate their ideas through talking, drawing,  Templates and mock-ups  **Make**  - select from and use a range of tools and equipment to perform practical tasks (cutting, shaping, joining and finishing)  - select from and use a wide range of materials and components, including construction  materials  **Evaluate**  - evaluate their ideas and products against design criteria  **Technical knowledge**  - explore and use mechanisms (levers), in their products. | **Linked Levers**  Concepts:  Technical Knowledge  Practical Knowledge  Design Process  National Curriculum:  **Design**  - use research and develop design criteria to inform the design of innovative, functional,  appealing products that are fit for purpose, aimed at particular individuals or groups  - generate, develop, model and communicate their ideas through discussion, annotated  Sketches and prototypes  **Make**  - select from and use a wider range of tools and equipment to perform practical tasks  (cutting and joining) accurately  - select from and use a wider range of materials and components, including construction  materials, according to their functional properties and aesthetic  qualities  **Evaluate**  - investigate and analyse a range of existing products  - evaluate their ideas and products against their own design criteria and consider the  views of others to improve their work  **Technical knowledge**  - understand and use mechanical systems in their products (levers) | **Shell Structures**  Concepts:  Technical Knowledge  Practical Knowledge  Design Inspiration  Design Process  National Curriculum:  Design  - use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups  - generate, develop, model and communicate their ideas through discussion and prototypes  Make  - select from and use a wider range of tools and equipment to perform practical tasks (cutting, shaping, joining and finishing) accurately  - select from and use a wider range of materials and components, including construction materials according to their functional properties and aesthetic qualities  Evaluate  - investigate and analyse a range of existing products  - evaluate their ideas and products against their own design criteria and consider the views of others to improve their work  - understand how key events and individuals in design and technology have helped shape the world  Technical knowledge  - apply their understanding of how to strengthen, stiffen and reinforce more complex structures | **App Control**  **Concepts:**  Technical Knowledge  Practical Knowledge  Design Inspiration  Design Process  National Curriculum:  **Design**  - use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups  - generate, develop, model and communicate their ideas through discussion, annotated sketches, prototypes,  **Make**  -select from and use a wider range of tools and equipment to perform practical tasks (joining) accurately  - select from and use a wider range of materials and components, including construction materials, according | **Pulleys and Gears**  Concepts:  Technical Knowledge  Design Inspiration  Design Process  National Curriculum:  **Design**  **-**use research and develop design criteria to inform the design of innovative, functional,  appealing products that are fit for purpose, aimed at particular individuals or groups  -generate, develop, model and communicate their ideas throughdiscussion, annotated  sketches, prototypes and computer-aided design  **Make**  -select from and use a wider range of tools and equipment to perform practical tasks  (cutting, shaping, joining and finishing) accurately  -select from and use a wider range of materials and components,  according to their functional properties and aesthetic  qualities  **Evaluate**  -evaluate their ideas and products against their own design criteria and consider the  views of others to improve their work  **Technical knowledge**  - understand and use mechanical systems in their products (gears & pulleys)  - understand and use electrical systems in their products (motors) |
| **Spring Term 2** | **Solid Structure**  Concepts:  Technical Knowledge  Design Inspiration  Design Process  National Curriculum:  Design  - design purposeful, functional, appealing products for themselves and other users based on design criteria  - generate, develop, model and communicate their ideas through talking, drawing and templates  Make  - select from and use a range of tools and equipment to perform practical tasks (cutting, shaping, joining)  - select from and use a wide range of materials and components, including construction materials, according to their characteristics  Evaluate  - explore and evaluate a range of existing products  - evaluate their ideas and products against design criteria  Technical knowledge  - build structures, exploring how they can be made stronger, stiffer and more stable | **Frame Structures**  Concepts:  Technical Knowledge  Practical Knowledge  Design Inspiration  Design Process  National Curriculum:  **Design**  - design purposeful, functional, appealing products for themselves and other users based on design criteria  - generate, develop, model and communicate their ideas through talking, drawing, templates and mock-ups  **Make**  - select from and use a range of tools and equipment to perform practical tasks (cutting with scissors, joining with glue)  - select from and use a wide range of materials and components, including construction materials and textiles according to their characteristics  **Evaluate**  -explore and evaluate a range of existing products  -evaluate their ideas and products against design criteria  **Technical knowledge**  - build structures, exploring how they can be made stronger, stiffer and more stable | **Vegetable Soup**  Concepts:  Design Inspiration  Practical Knowledge  Design Process  National Curriculum:  **Design**  -use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups  - generate, develop, model and communicate their ideas through discussion  **Make**  -select from and use a wider range of materials and components, including ingredients, according to their functional properties and aesthetic qualities  **Cooking and Nutrition**  - understand and apply the principles of a healthy and varied diet  - prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques  - understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. | **Textiles**  Concepts:  Technical Knowledge  Practical Knowledge  Design Inspiration  Design Process  National Curriculum:  Design  -use research and develop design criteria to inform the design of innovative, functional,  appealing products that are fit for purpose, aimed at particular individuals or groups  -generate, develop, model and communicate their ideas through discussion and  prototypes  Make  -select from and use a wider range of tools and equipment to perform practical tasks  (cutting and joining), accurately  - select from and use a wider range of materials and components, including textiles, according to their functional properties and aesthetic qualities  Evaluate  - investigate and analyse a range of existing products  -evaluate their ideas and products against their own design criteria and consider the views of others to improve their work  Technical knowledge  - apply their understanding of how to strengthen and reinforce more complex  structures | **CAMs**  Concepts:  Technical Knowledge  Design Inspiration  Design Process  National Curriculum:  **Design**  - use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups  - generate, develop, model and communicate their ideas through discussion, annotated sketches and cross-sectional  **Make**  - select from and use a wider range of tools and equipment to perform practical tasks (cutting, shaping, joining and finishing) accurately  - select from and use a wider range of materials and components, including construction materials, according to their functional properties and aesthetic qualities  **Evaluate**  - investigate and analyse a range of existing products  - evaluate their ideas and products against their own design criteria and consider the views of others to improve their work  **Technical knowledge**  - understand and use mechanical systems in their products (cams) | **Electric Motors**  Concepts:  Technical Knowledge  Design Inspiration  Design Process  National Curriculum:  Design  - use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups  - generate, develop, model and communicate their ideas through discussion, annotated sketches and prototypes  Make  - select from and use a wider range of tools and equipment to perform practical tasks (cutting, joining and finishing), accurately  - select from and use a wider range of materials and components, including construction materials, according to their functional properties and aesthetic qualities  Evaluate  - investigate and analyse a range of existing products  - evaluate their ideas and products against their own design criteria and consider the views of others to improve their work  Technical knowledge  - understand and use electrical systems in their products (incorporating switches and motors) |
| **Summer Term 2** | **Portable Snacks**  Concepts:  Design Inspiration  Practical Knowledge  Design Process  National Curriculum:  **Cooking and Nutrition**  -use the basic principles of a healthy and varied diet to prepare dishes  - understand where food comes from. | **Wheels and Axles**  Concepts:  Technical Knowledfe  Practical Knowledge  Design Inspiration  Design Process  National Curriculum:  **Design**  - design purposeful, functional, appealing products for themselves and other users based on design criteria  - generate, develop, model and communicate their ideas through talking and drawing  **Make**  - select from and use a range of tools and equipment to perform practical tasks (cutting and joining)  - select from and use a wide range of materials and components, including construction materials according to their characteristics  **Evaluate**  - explore and evaluate a range of existing products  - evaluate their ideas and products against design criteria  **Technical knowledge**  - explore and use mechanisms (wheels and axles), in their products. | **Frame Structures**  Concepts:  Technical Knowledge  Practical Knowledge  Design Inspiration  Design Process  National Curriculum:  **Design**  -use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups  - generate, develop, model and communicate their ideas through discussion, annotated sketches and prototypes.  **Make**  -select from and use a wider range of tools and equipment to perform practical tasks  (cutting, joining – jinks and struts) accurately  - select from and use a wider range of materials and components, including construction materials according to their functional properties and aesthetic qualities  **Evaluate**  -investigate and analyse a range of existing products  - evaluate their ideas and products against their own design criteria and consider the views of others to improve their work  **Technical knowledge**  -apply their understanding of how to strengthen, stiffen and reinforce more complex structures | **Paper Circuits**  Concepts:  Technical Knowledge  Design Inspiration  Design Process  National Curriculum:  **Design**  -use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups  -generate, develop, model and communicate their ideas through discussion, and annotated  sketches  **Make**  -select from and use a wider range of tools and equipment to perform practical tasks (cutting – scissors, joining – glue and copper tape) accurately  - select from and use a wider range of materials and components, including construction  Materials according to their functional properties and aesthetic qualities  **Evaluate**  - investigate and analyse a range of existing products  - evaluate their ideas and products against their own design criteria and consider the  views of others to improve their work  **Technical knowledge**  -understand and use electrical systems in their products (for example, series circuits incorporating switches and bulbs) | **Frame Structures**  Concepts:  Technical Knowledge  Design Inspiration  Design Process  National Curriculum:  **Design**  - use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups  - generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams and prototypes  **Make**  -select from and use a wider range of tools and equipment to perform practical tasks (cutting and joining) accurately  - select from and use a wider range of materials and components, including construction materials and textiles, according to their functional properties and aesthetic qualities  **Evaluate**  -investigate and analyse a range of existing products  -evaluate their ideas and products against their own design criteria and consider the views of others to improve their work  **Technical knowledge**  - apply their understanding of how to strengthen, stiffen and reinforce more complex structures | **Food Throughout the Year & Bolognese**  Concepts:  Design Inspiration  Practical Knowledge  Design Process  National Curriculum:  **Design**  -use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups  - generate, develop, model and communicate their ideas through discussion  **Make**  -select from and use a wider range of materials and components, including ingredients, according to their functional properties and aesthetic qualities  **Cooking and Nutrition**  - understand and apply the principles of a healthy and varied diet  - prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques  - understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. |