|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Design & Technology**    **Curriculum Coverage**  **EYFS – Cycle A** | | | | |
| **Unit of work** | **Autumn**  **Hinges & catches** | **Spring**  **Let’s look at products** | **Summer**  **Let’s look at vehicles** |
| **Prior Learning** | It is helpful if the children have:   * followed simple oral instructions * used scissors to cut a variety of resources * joined materials using tape and glue * prior knowledge of simple properties of materials eg. paper, card, metal. | What products do you use at home?  What are their purpose?  How do they make life easier? | Name different vehicles  What are each vehicle used for? |
| **Core Learning** | Show and discuss hinges – a moveable joint that connects 2 surfaces.  Go on a walk around school to find hinges.  Take photographs to recall and discuss.  Look at a variety of boxes with hinges and catches.  Encourage the children to explore and discuss.  Question the children:  What is the box used for?  What could go inside?  What happens to the lid?  How does it open and close?  What does the catch do?  How does it work?  Which hinge do you think works the best?  Which catch works the best?  Who do you think would use this box?  PowerPoint – ideas for the design of boxes plus hinges and catches.  To make a variety of models.  Using hole punchers to produce holes initially on paper and then moving onto thin/thick card.  Hole punch paper/thin card and weave wool through to make a bracelet.  Make a simple puppet with moveable part/s.  Make a Christmas card using a variety of simple different hinges.  Produce envelopes with a variety of catches  More able to use a design sheet.  Encourage them to follow their plan during making.  AV/LA to choose materials and make box with a hinge and a catch varying degrees of adult help.  Help them to evaluate their work by questioning:  Does the hinge work well?  Does the catch work?  Do you like the way it looks?  Will it be strong enough to last?  Would you change anything if you could? | Anyway Up Cup  Put a selection of cups into the water tray and allow children to investigate.  Show a standard cup and ask why a toddler could not use a cup like this. Why does a toddler’s cup have handles? Why is the cup small? Why does it have a lid? Could the toddler take the lid off? Why is this important? What is it made from? Why is it made from plastic? Draw their attention to the colour of the product. Why have these colours been used? Read the warning ‘no boiling water’ from the bottom of the cup. Ask why this would not be safe. Look closely at the spout design and discuss how the ‘non spill valve’ works. Show the children the ‘air hole’ on the lid. Discuss its function.  Slipper  Put a selection of fabrics on the ground. Ask the children to remove their shoes and socks and feel the fabrics with the sole of their foot. Which fabric feels most comfortable? Look at a variety of children’s slippers. Who do you think would wear these slippers? Why is the inside made from soft fabric? How have the fabrics been joined together? Has the sole been sewn on? Draw children’s attention to the patten on the sole? Discuss its function. Why isn’t the sole made from the same fabric as the rest of the slipper?  Safety Glasses  Show the children a selection of glasses and goggles - sunglasses, swimming goggles and safety glasses. Allow them to investigate the products and to wear them.  Discuss the safety glasses: What are they made from? Why are they made from plastic? Who might use these glasses? Why do the arms fold back? Discuss the word ‘hinge’ - ask the children to find other examples of hinges in the room, e.g. doors, cupboards, windows. Why do safety glasses have an extra piece of plastic at the top and sides? | Begin to research and design a form of transport for an Alien  Questions  Do you like any of the cars?  What do you like about the car?  Why?  What does this feature do?  Design Alien car  Questions  Which alien is your vehicle for?  What do you want your car to look like?  What will it do?  How will it move?  What things do you think you are going to need to make your model?  Make Alien car from design  Questions  What are you going to use to make your car?  How are you going to join it?  Evaluate model  Questions  Does your model look like your design?  Do you like your design?  Would you change or improve your design? |
| **Vocabulary** | In this unit, children have to use words and phrases  relating to:   * designing e.g. choose * making e.g. hole punch, scissors, join, cut * knowledge and understanding eg. moving, up, down, open, close, hinge, joint, catch | spout  plastic  handles  fabric  soles  stitching  grip  elastic  sew  hinge  plastic  lens | Vocab - think, design, features.  Vocab - draw, design, pencil, paper, colour, style, features.  Vocab - boxes, bottles, wheels, axles, tape, stick, glue, join, model, turn, move.  Vocab - model, design, evaluation, What do you think? like, dislike, happy, unhappy, change, improve. |
| **Personal Development** | What do you think you did well?  How do you think you could do better next time? | How would your life be different without these products?  Are there some products you could not do without –why? | How do you think the alien liked your car?  What do you think you did well?  How do you think you could do better next time? |
| **Quick Quiz** | How does a hinge work?  How does a catch work? | Name features of a   * Anyway up cup * Slipper * Safety glasses | Can you discuss the steps you made to make your car? |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Design & Technology**    **Curriculum Coverage**  **Year 1/2 – Cycle A** | | | | | |
| **Unit of work** | **Autumn**  **Mechanisms**  Sliders and levers | | **Spring**  **Textiles**  Templates & joining techniques | **Summer**  **Food**  Preparing fruit & vegetables |
| **Prior Learning** | EYFS Year A: **Hinges and catches**  Year B: **Mechanisms** Wheels and axles   * Early experiences of working with paper and card to make simple flaps and hinges. * Experience of simple cutting, shaping and joining skills using scissors, glue, paper fasteners and masking tape | | * Explored and used different fabrics. * Cut and joined fabrics with simple techniques. * Thought about the user and purpose of products | Year B: **Food** Preparing fruit & vegetables   * Experience of common fruit and vegetables, undertaking sensory activities i.e. appearance taste and smell. * Experience of cutting soft fruit and vegetables using appropriate utensils. |
| **Core Learning** | **Investigative and Evaluative Activities (IEAs)**  Children explore and evaluate a collection of books and everyday products that have moving parts, including those with levers and sliders. e.g. What is it? Who is it for? What is it for?  • Use questions to develop children’s understanding e.g. What do you think will move? How will you make it move? What part of the product moved and how did it move? How do you think the mechanism works? What else could move in the product? How well does it work?  • Introduce and develop vocabulary e.g. lever, pivot, slider, left, right, push, pull, up, down, forwards, backwards, in, out.  **Focused Tasks (FTs)**  • Demonstrate simple levers and sliders to the children using prepared teaching aids. It is helpful if these are also used in context e.g. the slider is used to show a snail appearing from behind a stone, the lever is used to show a butterfly flying to a flower.  • Use questions to develop children’s understanding e.g. How does the slider move? How does the lever move? Which part of the mechanism is the pivot? What does the movement of the slider and lever remind you of?  • Following teacher demonstration of the correct use of tools and materials, children should develop their knowledge and skills by replicating the slider and lever teaching aids. Encourage children to add pictures to their mechanisms.  **Design, Make and Evaluate Assignment (DMEA)**  • Discuss with the children what they will be designing, making and evaluating e.g. Who will your product be for? What will be its purpose? How do you want it to move? Will you use a lever or a slider?  • Generate simple design criteria with the children e.g. the mechanism should work smoothly, it should make the right type of movement.  • Encourage the children to develop their ideas through talking, drawing and making mock-ups of their ideas with paper and card.  • Discuss the finishing techniques the children might use e.g. using digital text and graphics, paint, felt tipped pens or collage.  • As a whole class, talk about the order in which the mechanisms will be made.  • Ask children to evaluate their developing ideas and final products against the original design criteria. | | **Investigative and Evaluative Activities (IEAs)**  • Children investigate and evaluate existing products linked to the chosen project. Explore and compare e.g. fabrics, joining techniques, finishing techniques and fastenings used.  • Use questions to develop children’s understanding e.g. How many parts is it made from? What is it joined with? How is it finished? Why do you think these joining techniques have been chosen? How is it fastened? Who might use it and why?  • Make drawings of existing products, stating the user and purpose. Identify and label, if appropriate, the fabrics, fastenings and techniques used.  **Focused Tasks (FTs)**  • Investigate fabrics to determine which is best for the purpose of the product they are creating.  • Using prepared teaching aids, demonstrate the use of a template or simple paper pattern. Children could make their own templates or paper patterns. If necessary, they can use ones provided by the teacher.  • Using prepared teaching aids, demonstrate the correct use of appropriate tools to mark out, tape or pin the fabric to the templates or paper patterns and cut out the relevant fabric pieces for the product.  • Using prepared teaching aids, demonstrate appropriate examples of joining techniques for children to practise in guided groups e.g. running stitch including threading own needle, stapling, lacing and gluing. Talk about the advantages and disadvantages of each technique.  • Using prepared teaching aids, demonstrate examples of finishing techniques for children to practise in guided groups e.g. sewing buttons, 3-D fabric paint, gluing sequins, printing.  **Design, Make and Evaluate Assignment (DMEA)**  • Provide the children with a context that is authentic. Discuss with children the purpose and user of the products they will be designing, making and evaluating. Design criteria developed with the teacher should be used to guide the development and evaluation of the children’s products.  • Ask the children to generate a range of ideas e.g. What parts will the product need to have and what will it be made from? What size will it be? How will it be joined and finished?  • Through talk, drawings and mock-ups, ask the children to develop and communicate their ideas. Information and communication technology could be used for symmetry and pattern ideas. Choose one idea to follow through.  • Talk with the children about the stages in making before assembling quality products, applying the knowledge, understanding and skills learnt through the IEAs and FTs.  • Evaluate ongoing work and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed. | **Investigative and Evaluative Activities (IEAs)**  • Children examine a range of fruit/vegetables. Use questions to develop children’s understanding e.g. What is this called? Who has eaten this fruit/vegetable before? Where is it grown? When can it be harvested? What are its taste, smell, texture and appearance? What will it look like if we peel it or cut it in half? What are the different parts called?  • Provide opportunities for children to handle, smell and taste fruit and vegetables in order to describe them through talking and drawing. e.g. What words can we use to describe the shape, colour, feel, taste?  • Evaluate existing products to determine what the children like best; provide opportunities for the children to investigate preferences of their intended users/suitability for intended purposes e.g. What do you prefer and why? What might we want to include in our product to meet our user’s preferences? Which fruit/vegetables might be the best for our product to match the occasion/purpose?  **Focused Tasks (FTs)**  • Discuss basic food hygiene practices when handling food including the importance of following instructions to control risk e.g. What should we do before we work with food? Why is following instructions important?  • Demonstrate how to use simple utensils and provide opportunities for the children to practise food-processing skills such as washing, grating, peeling, slicing, squeezing e.g. Do we eat the whole fruit? Why or why not? Which parts do we eat? What might we have to do before eating this? Why do we cut, grate, peel and slice in this way? Discuss different effects achieved by different processes.  • Discuss healthy eating advice, including eating more fruit and vegetables; using The Eatwell Guide model talk about the importance of fruit and vegetables in our balanced diet e.g. Why is it good to eat fruit and vegetables? How many pieces of fruit/vegetables do you eat per day? Why is it important to wash fruit/vegetables before we eat them?  **Design, Make and Evaluate Assignment (DMEA)**  • Set a context for designing and making which is authentic and meaningful.  • Discuss with the children the possible products that they might want to design, make and evaluate and who the products will be for. Agree on design criteria that can be used to guide the development and evaluation of children’s products e.g. Who/what is the product for? What will make our product unique/different? How will we know that we designed and made a successful product?  • Use talk and drawings when planning for a product; ask the children to develop, model and communicate their ideas e.g. What will you need? What fruit/vegetable will you need? How much will you need? How will you present the product?  • Talk to the children about the main stages in making, considering appropriate utensils and food processes they learnt about through IEAs and FTs.  • Evaluate as the children work through the project and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed. |
| **Vocabulary** | slider, lever, pivot, slot, bridge/guide  card, masking tape, paper fastener, join  pull, push, up, down, straight, curve, forwards, backwards  design, make, evaluate, user, purpose, ideas, design criteria, product, function | | names of existing products, joining and finishing techniques, tools, fabrics and components  template, pattern pieces, mark out, join, decorate, finish  features, suitable, quality mock-up, design brief, design criteria, make, evaluate, user, purpose, function | fruit and vegetable names, names of equipment and utensils  sensory vocabulary e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard  flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients, planning, investigating tasting, arranging, popular, design, evaluate, criteria |
| **Personal Development** | Developing values of  creativity  perseverance  What could I do better? Learning from my experiences. | | Developing values of  creativity  perseverance  What could I do better? Learning from my experiences. | Developing values of  creativity  perseverance  What could I do better? Learning from my experiences. |
| **Quick Quiz** | How do simple mechanisms move?   * Straight line * Backwards and forwards * Round and round * In a curve   What is a slider? Lever? How do they make something move? | | What different ways can you join?   * Glue * Stapling * Safety pin * Pinning * Sewing   What finishing techniques can you use?   * Textile paints – glitter * Textile paints –raised * Adding sequins and shiny fabric * Fabric crayons | Can you stay how we can be hygienic?   * Jewellery removed * Hair tied back * Apron is on * Sleeves are rolled up * Hands washed * Cuts covered with blue waterproof dressing |
| **Design & Technology**    **Curriculum Coverage**  **Year 3/4– Cycle A** | | | | | |
| **Unit of work** | **Autumn**  **Structures**  Shell structures | **Spring**  **Textiles**  2D shape to 3D product | | **Summer**  **Food**  Healthy & varied diet |
| **Prior Learning** | Year 1/2 Year B:  **Structures** Free standing structures   * Experience of using different joining, cutting and finishing techniques with paper and card. * A basic understanding of 2-D and 3-D shapes in mathematics and the physical properties and everyday uses of materials in science. | Year 1/2 Year A:  **Textiles** Templates & joining techniques   * Have joined fabric in simple ways by gluing and stitching. * Have used simple patterns and templates for marking out. * Have evaluated a range of textile products. | | Year 1/2 Year A & B:  **Food Preparing** fruit & vegetables   * Know some ways to prepare ingredients safely and hygienically. * Have some basic knowledge and understanding about healthy eating and The Eatwell Guide. * Have used some equipment and utensils and prepared and combined ingredients to make a product. |
| **Core Learning** | **Investigative and Evaluative Activities (IEAs)**  • Children investigate a collection of different shell structures including packaging. Use questions to develop children’s understanding e.g. What is the purpose of the shell structure – protecting, containing, presenting? What material is it made from? How has it been constructed? Are the materials recyclable or reusable? How has it been stiffened i.e. folded, corrugated, ribbed, laminated? What size/shape/colour is it? What information does it show and why? How attractive is the design?  • Children take a small package apart identifying and discussing parts of a net including the tabs e.g. How are different faces of the package arranged? How are the tabs used to join the ‘free’ edges of the net?  • Evaluate existing products to determine which designs children think are the most effective. Provide opportunities for the children to judge the suitability of the shell structures for their intended users and purposes. Discuss graphics including colours/impact of style/logo/size of font e.g. What do you prefer and why? What style of graphics and lettering might we want to include in our product to meet users’ preferences and its intended purpose? Which packaging might be the best for…?  **Focused Tasks (FTs**)  • Children use kit parts with flat faces to construct nets. Practise making nets out of card, joining flat faces with masking tape to create 3-D shapes. Experiment with assembling in nets in numerous ways.  • Demonstrate skills and techniques of scoring, cutting out and assembling using pre-drawn nets. Then allow children to practise by constructing a simple box. Show how a window could be cut out and acetate sheet added.  • Demonstrate how to use different ways of stiffening and strengthening their shell structures e.g. folding and shaping, corrugating, ribbing, laminating. Provide opportunities for the children to practise these and to carry out tests to find out where their structures might need to be strengthened or stiffened.  • Children discuss and explore the graphics techniques and media that could be used to achieve the desired appearance of their products.  • Practise using computer-aided design (CAD) software to design the net, text and graphics for their products according to purposes.  **Design, Make and Evaluate Assignment (DMEA**)  • Develop a design brief with the children within a context which is authentic and meaningful.  • Discuss with the children the uses and purposes of their shell structures e.g. What does the product need to do? Who is it aimed at? How will the purpose and user affect your design decisions? Agree on design criteria that can be used to guide the development and evaluation of children’s products e.g. How will we know that we have designed and made successful products?  • Ask the children to use annotated sketches and prototypes to develop, model and communicate their ideas for the product e.g. What will you need to include in your design? How can you improve it? What materials will you use? How will you make sure your product works well and has the right appearance?  • Ask children to identify the main stages of making and the appropriate tools and skills they learnt through focused tasks. Encourage the children to work with accuracy, using computer-aided design (CAD) where appropriate.  • Evaluate throughout and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed. | **Investigative and Evaluative Activities (IEAs)**  • Children investigate a range of textile products that have a selection of stitches, joins, fabrics, finishing techniques, fastenings and purposes, linked to the product they will design, make and evaluate. Think about products from the past and what changes have been made in textile production and products e.g. the invention of zips and Velcro.  • Give children the opportunity to disassemble appropriate textiles products to gain an understanding of 3-D shape, patterns and seam allowances.  • Use questioning to develop understanding e.g. What is its purpose? Which one is most suited to its purpose? What properties/characteristics does the fabric have? Why has this fabric been chosen? How has the fabric been joined together? How effective are its fastenings? How has it been decorated? Does its decoration have a purpose? What would the 2-D pattern piece look like? What are its measurements? How might you change the product?  **Focused Tasks (FTs)**  • Demonstrate a range of stitching techniques and allow children to practise sewing two small pieces of fabric together, demonstrating the use of, and need for, seam allowances.  • Allow children to use a textile product they have taken apart to create a paper pattern using 2-D shapes.  • Provide a range of fabrics – children to consider whether fabrics are suitable for the chosen purpose and user. The fabrics also can be used for demonstrating and testing out a range of decorative finishing techniques e.g. appliqué, embroidery, fabric pens/paints, printing.  • Use questioning to develop understanding e.g. Which joining technique makes the strongest seam? Why? Which stitch is appropriate for the purpose? Which joining techniques are suitable for the fabric and purpose? How can you stiffen your fabric? What is the purpose of the fastenings? Which one is most suited to the purpose and user? What decorative techniques have been used? What effect do they have?  **Design, Make and Evaluate Assignment (DMEA)**  • Children to create a design brief, supported by the teacher, set within a context which is authentic and meaningful. Discuss the intended user, purpose and appeal of their product. Create a set of design criteria.  • Ask children to sketch and annotate a range of possible ideas, constantly encouraging creative thinking. Produce mock-ups and prototypes of their chosen product.  • Plan the main stages of making e.g. using a flowchart or storyboard.  • Children to assemble their product using their existing knowledge, skills and understanding from IEAs and FTs. Encourage children to think about the aesthetics and quality finish of their product.  • Evaluate as the process is undertaken and the final product in relation to the design brief and criteria. The product should be tested by the intended user and for its purpose and others’ views sought to help with identifying possible improvements. | | **Investigative and Evaluative Activities (IEAs)**  • Children investigate a range of food products e.g. the content of their lunchboxes over a week, a selection of foods provided for them, food from a visit to a local shop. Link to the principles of a varied and healthy diet using The Eatwell Guide e.g. What ingredients have been used? Which food groups do they belong to? What substances are used in the products e.g. nutrients, water and fibre?  • Carry out sensory evaluations on the contents of the food from e.g. a variety of bought food products such as a range of wraps or sandwiches. Record results, for example using a table. Use appropriate words to describe the taste/smell/texture/appearance e.g. How do the sensory characteristics affect your liking for the food?  • Gather information about existing products available relating to your product. Visit a local supermarket and/or use the internet.  • Find out how a variety of ingredients used in products are grown and harvested, reared, caught and processed e.g. Where and when are the ingredients grown? Where do different meats/fish/cheese/eggs come from? How and why are they processed?  **Focused Tasks (FTs)**  • Learn to select and use a range of utensils and use a range of techniques as appropriate to prepare ingredients hygienically including the bridge and claw technique, grating, peeling, chopping, slicing, mixing, spreading, kneading and baking.  • Food preparation and cooking techniques could be practised by making a food product using an existing recipe.  • Discuss basic food hygiene practices when handling food including the importance of following instructions to control risk e.g. What should we do before we work with food? Why is following instructions important?  **Design, Make and Evaluate Assignment (DMEA)**  • Discuss the purpose of the products that the children will be designing, making and evaluating and who the products will be for.  • Develop and agree on design criteria with the children within a context that is authentic and meaningful. This can include criteria relating to healthy eating and a varied diet e.g. What do you need to consider to make it part of a balanced diet? How do we select the ingredients? How could we make it appealing to eat?  • Ask children to generate a range of ideas encouraging realistic responses.  • Using discussion, annotated sketches and information and communication technology if appropriate, ask the children to develop and communicate their ideas.  • Ask children to consider the main stages in making the food product, before preparing/cooking the product including the ingredients and utensils they will need.  • Evaluate as the assignment proceeds and the final product against the intended purpose and user, reflecting on the design criteria previously agreed. Consider what others think of the product when considering how the work might be improved. |
| **Vocabulary** | shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity  marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating  font, lettering, text, graphics, decision, evaluating, design brief design criteria, innovative, prototype | fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance  user, purpose, design, model, evaluate, prototype, annotated sketch, functional, innovative, investigate, label, drawing, aesthetics, function, pattern pieces | | name of products, names of equipment, utensils, techniques and ingredients  texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury  hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet  planning, design criteria, purpose, user, annotated sketch, sensory evaluations |
| **Personal Development** | Developing values of  creativity  perseverance  What could I do better? Learning from my experiences. | Developing values of  creativity  perseverance  What could I do better? Learning from my experiences. | | Developing values of  creativity  perseverance  What could I do better? Learning from my experiences. |
| **Quick Quiz** | How do you stiffen and strengthen sheet materials?   * Laminating * Corrugating * Ribbing   Explain each one | Name the different stitches for joining:   * Back * Backwards running * Over sew * Blanket * Running   Describe the cutting out techniques  What possible fastenings could you use? | | How can you analyse existing products?  • Appearance  • Smell  • Taste  • Texture  How do you safely  • Grate cheese  • Spread butter  • Cut using the bridge technique  • Cut using the claw technique |
| **Design & Technology**    **Curriculum Coverage**  **Year 5/6 – Cycle A** | | | | | |
| **Unit of work** | **Autumn**  **Structures**  Frame structures | **Spring**  **Food**  Celebrating culture & seasonality | | **Summer**  **Electrical systems**  More complex circuits & switches |
| **Prior Learning** | Year 1/2 Year B:  **Structures** Free standing structures  Year 3/4 Year A:  **Structures** Shell structures   * Experience of using measuring, marking out, cutting, joining, shaping and finishing techniques with construction materials. * Basic understanding of what structures are and how they can be made stronger, stiffer and more stable. | Year 1/2 Year A & B:  **Food Preparing** fruit & vegetables  Year 3/4 Year A:  **Food** Healthy & varied diet   * Have knowledge and understanding about food hygiene, nutrition, healthy eating and a varied diet. * Be able to use appropriate equipment and utensils, and apply a range of techniques for measuring out, preparing and combining ingredients. | | Year 3/4 Year B:  **Electrical systems** Simple circuits & switches   * Understanding of the essential characteristics of a series circuit and experience of creating a battery-powered, functional, electrical product. * Initial experience of using computer control software and an interface box or a standalone box, e.g. writing and modifying a program to make a light flash on and off. |
| **Core Learning** | **Investigative and Evaluative Activities (IEAs)**  • Children investigate and make annotated drawings of a range of portable and permanent frame structures, e.g. tents, bus shelters, umbrellas. Use photographs and web-based research to extend the range e.g. How well does the frame structure meet users’ needs and purposes? Why were materials chosen? What methods of construction have been used? How has the framework been strengthened, reinforced and stiffened? How does the shape of the framework affect its strength? How innovative is the design? When was it made? Who made it? Where was it made?  • Children could research key events and individuals related to their study of frame structures e.g. Stephen Sauvestre – a designer of the Eiffel Tower; Thomas Farnolls Pritchard – designer of the Iron Bridge. They could also learn about locally important design and technology activity related to their project.  **Focused Tasks (FTs)**  • Use a construction kit consisting of plastic strips and paper fasteners to build 2-D frameworks. Compare the strength of square frameworks with triangular frameworks. Ask the children to reinforce square frameworks using diagonals to help develop an understanding of using triangulation to add strength to a structure.  • Demonstrate how paper tubes can be made from rolling sheets of newspaper diagonally around pieces of e.g. dowel. Ask children to use these tubes and masking tape or paper straws with pipe cleaners to build 3-D frameworks such as cubes, cuboids and pyramids. How could each of the frameworks be reinforced and strengthened?  • Demonstrate the accurate use of tools and equipment. Develop skills and techniques using junior hacksaws, G-clamps, bench hooks, square section wood, card triangles and hand drills to construct wooden frames, as appropriate.  • Demonstrate skills and techniques for accurately joining framework materials together e.g. paper straws, square sectioned wood. Ask children to practise these, mounting their joints onto card for future reference.  **Design, Make and Evaluate Assignment (DMEA)**  • Discuss the brief of designing and making a small-scale frame structure e.g. Who is the intended user and what is the purpose of the frame structure? Will it be permanent, or can it be easily dismantled? What materials will you use? How will it be joined? How will it be reinforced? How will it be finished? Children should be encouraged to generate innovative ideas, drawing on their research. Ask children to develop a simple design specification to guide their thinking.  • Children should produce a detailed, step-by-step plan, listing tools and materials.  • Children’s sketches should be annotated with notes to help develop and communicate their ideas.  • Encourage children to model their ideas first using materials such as paper, card and paper straws e.g. How will you make it stable? How will it stand up? How could you make it stronger? Where are the weak points? How could you reinforce them? What tools and materials will you need? How can you improve the design?  • Encourage children to make their products with accuracy. They should regularly evaluate their work and their completed product, drawing on their design specification, and thinking about the intended purpose and user. | **Investigative and Evaluative Activities (IEAs)**  • Children use first hand and secondary sources to carry out relevant research into existing products to include personal/cultural preferences, ensuring a healthy diet, meeting dietary needs and the availability of locally sourced/seasonal/organic ingredients. This could include a visit to a local bakery, farm, farm shop or supermarket e.g. What ingredients are sourced locally/in the UK/from overseas? What are the key ingredients needed to make a particular product? How have ingredients been processed? What is the nutritional value of a product?  • Children carry out sensory evaluations of a variety of existing food products and ingredients relating to the project. The ingredients could include those that could be added to a basic recipe such as herbs, spices, vegetables or cheese. These could be locally sourced, seasonal, Fair Trade or organic. Present results in e.g. tables/graphs/charts and by using evaluative writing.  • Use a range of questions to support children’s ability to evaluate food ingredients and products e.g. What ingredients help to make the product spicy/crisp/crunchy etc? What is the impact of added ingredients/finishes/shapes on the finished product?  • Research key chefs and how they have promoted seasonality, local produce and healthy eating.  **Focused Tasks (FTs)**  • Demonstrate how to measure out, cut, shape and combine e.g. knead, beat, rub and mix ingredients.  • Demonstrate how to use appropriate utensils and equipment that the children may use safely and hygienically.  • Techniques could be practised following a basic recipe to prepare and cook a savoury food product.  • Ask questions about which ingredients could be changed or added in a basic recipe such as types of flour, seeds, garlic, vegetables. Consider texture, taste, appearance and smell.  • When using a basic dough recipe, explore making different shapes to change the appearance of the food product e.g. Which shape is most appealing and why?  **Design, Make and Evaluate Assignment (DMEA)**  • Develop a design brief and simple design specification with the children within a context that is authentic and meaningful. This can include design criteria relating to nutrition and healthy eating.  • Discuss the purpose of the products that the children will be designing, making and evaluating and who the products will be for.  • Ask children to generate a range of ideas encouraging innovative responses. Agree on design criteria that can be used to guide the development and evaluation of the children’s product.  • Using annotated sketches, discussion and information and communication technology if appropriate, ask children to develop and communicate their ideas.  • Ask children to record the steps, equipment, utensils and ingredients for making the food product drawing on the knowledge, understanding and skills learnt through IEAs and FTs.  • Evaluate the work as it progresses and the final product against the intended purpose and user reflecting on the design specification previously agreed. | | **Investigative and Evaluative Activities (IEAs)**  • Using research, discuss a range of relevant products that respond to changes in the environment using a computer control program such as automatic nightlights, alarm systems, security lighting e.g. Who have the products been designed for and for what purpose? How and why is a computer control program used to operate the products? What input devices, e.g. switches, and output devices, e.g. bulbs, have been used?  • Investigate electrical sensors such as light dependent resistors (LDRs) and a range of switches such as push-to-make switches, push-to-break switches, toggle switches, micro switches and reed switches. To gain an understanding of how they are operated by the user and how they work, ask the children to use each component to control a bulb in a simple circuit. Remind children about the dangers of mains electricity.  • Children could research famous inventors related to the project e.g. Thomas Edison – light bulb.  **Focused Tasks (FTs)**  • Through teacher demonstration and explanation, recap measuring, marking out, cutting and joining skills with construction materials that children will need to create their electrical products.  • Demonstrate and enable children to practise methods for making secure electrical connections e.g. using automatic wire strippers, twist and tape electrical connections, screw connections and connecting blocks.  • Drawing on science understanding, ask the children to explore a range of electrical systems that could be used to control their products, including a simple series circuit where a single output device is controlled, a series circuit where two output devices are controlled by one switch and, where appropriate, parallel circuits where two output devices are controlled independently by two separate switches.  • Drawing on related computing activities, ensure that children can write computer control programs that include inputs, outputs and decision making. Test out the programs using electrical components connected to interface boxes or standalone boxes.  • Teach children how to avoid making short circuits.  **Design, Make and Evaluate Assignment (DMEA)**  • Develop an authentic and meaningful design brief with the children.  • Ask the children generate innovative ideas by drawing on research and develop a design specification for their product, carefully considering the purpose and needs of the intended user.  • Communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams. Drawings should indicate the design decisions made, including the location of the electrical components and how they work as a system with an input, process and output.  • Produce detailed step-by-step plans and lists of tools, equipment and materials needed. If appropriate, allocate tasks within a team.  • Make high quality products, applying knowledge, understanding and skills from IEAs and FTs. Create and modify a computer control program to enable the product to work automatically in response to changes in the environment.  • Critically evaluate throughout and the final product, comparing it to the original design specification. Test the system to demonstrate its effectiveness for the intended user and purpose. |
| **Vocabulary** | frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent  design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional | ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs  fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, | | series circuit, parallel circuit, names of switches and components, input device, output device, system, monitor, control, program, flowchart  function, innovative, design specification, design brief, user, purpose |
| **Personal Development** | Developing values of  creativity  perseverance  What could I do better? Learning from my experiences. | Developing values of  creativity  perseverance  What could I do better? Learning from my experiences. | | Developing values of  creativity  perseverance  What could I do better? Learning from my experiences. |
| **Quick Quiz** | Describe the different ways to join straws?  Why do we use card corners?  Why do we use triangles? | Name and explain some of the techniques you could use   * Mixing * Rubbing * kneading | | Name the different switches and sensors |