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| **TO MASTER PRACTICAL SKILLS** | | **TO DESIGN, MAKE, EVALUATE AND IMPROVE** | **TO TAKE INSPIRATION FROM DESIGN THROUGHOUT HISTORY** | |
| **Class: 1 SPRING** | | | **Title: Mechanics** | |
| **Topic summary:** Children design and make moon buggies – wheels and axle mechanisms | | | | |
| **DT Objectives** | | | **Unit of work end points** | |
| * Create products using levers, wheels and winding mechanisms * .**Make products refining the design as work progresses** * **Design products that have a clear purpose and an intended user.** * **Explore objects and designs to identify likes and dislikes of the designs.** * **Suggest improvements to existing designs.** | | | • What is a mechanism?  • Define the word ‘rotate’.  • Define the word ‘force’.  • Draw annotated diagrams to show what happens to the speed and force of a wheel and axle when one or the other is turned. | |
| **Key vocabulary** | | | **Important Dates** | **Questions?** |
| mechanism: | Something that changes the direction or size of a push or a pull | | Neil Armstrong and the first trip to the moon July 20, 1969, at 20:17 | What shapes can you see in these moon buggies? |
| **rotating** | If something is rotating it is turning | |  | How can we join materials together to make a trolley? |
| **Force** | Push or pull | |  | Can you adapt your design to show the wheel will be few moving? |
| **Attach** | if you attach something you fasten or join it to another object | |  | How can we adapt our trolleys so that they become good moon buggies? |
| **chassis** | the frame on which a vehicle is built | |  | Do our moon buggies meet the design brief? |
| **automatically** | an automatic action is one that you do without thinking about it effortlessly | |  |  |
| **fluency** | if you are fluent in something you do it effortlessly | |  |  |
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| **TO MASTER PRACTICAL SKILLS** | | **TO DESIGN, MAKE, EVALUATE AND IMPROVE** | **TO TAKE INSPIRATION FROM DESIGN THROUGHOUT HISTORY** | |
| **Class: 1 - 2 Spring** | | | **Title: MECHANICS/TEXTILES** | |
| **Topic summary:** A slider is a rod that moves when it is pushed or pulled. If an object is attached to one end of the rod, the push or pull will move it. The front view shows the slider rod passing through a slot in the card. The rear view shows a guide bridge that stops the slider rod from rotating.  Slider 2 - Slider mechanisms can guide an object in a straight or curved line and the slot can be cut in any direction: horizontal, vertical, diagonal or curved.  Slider 3 - Attaching an object to your slider rod can be done in a number of different ways. The simplest way to attach an object is to fasten it to the slider rod with glue, tape or staples. This is fine if you attach a flat object to your slider rod, but sometimes you may want to attach an object that stands out from the background. Create 3D object, colour and decorate using textiles, shaping textiles using templates.  **Apply your knowledge of slider mechanisms to make products. • Explain how the slider mechanisms are made, using annotated diagrams. Experiment with a variety of different slider mechanisms in your products.** | | | | |
| **DT Objectives** | | | **Unit of work end points** | |
| MECHANICS   * Create products using levers, wheels and winding mechanisms * **Make products refining the design as work progresses** * **Design products that have a clear purpose and an intended user.** * **Explore objects and designs to identify likes and dislikes of the designs.** * **Suggest improvements to existing designs.**   TEXTILES   * **Shape textiles using templates.** * **Colour and decorate textiles using a number of techniques.** | | | * Make a slider mechanism without a guide bridge. * Describe what happens to the slider rod without a guide bridge. * Add the guide bridge. * Describe what happens when a guide bridge is added. * Draw annotated diagrams of what happened before and after the guide bridge was added. | |
| **Key vocabulary** | | | **Important Dates** | **Questions?** |
| rear: | if something is at the rear, it is at the back | |  | What happens to the slider rod without a guide bridge? |
| guide bridge:  turning | a piece of material that makes something go in the right direction | |  | What happens when a guide bridge is added? |
| **Rotating** | if something is rotating, it is turning | |  |  |
| **Horizontal** | Flat and level with the ground rather than at an angle | |  |  |
| **Vertical** | Standing or pointing straight up | |  |  |
| **Diagonal** | In a sloping direction | |  |  |
| **Attach** | If you attach something to an object, you join it or fasten it to the object | |  |  |
| **Template** | A shaped piece if rigid material used as a pattern | |  |  |

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| **TO MASTER PRACTICAL SKILLS** | | **TO DESIGN, MAKE, EVALUATE AND IMPROVE** | **TO TAKE INSPIRATION FROM DESIGN THROUGHOUT HISTORY** | |
| **Class: 6 Spring** | | | **Title: TEXTILES** | |
| Design and make a cushion which is aesthetically comfortable and decorative. | | | | |
| **DT OBJECTIVES** | | | **Unit of work end points** | |
| * **Join textiles with a combination of stitching techniques (such as back stitch for seams and running stitch to attach decoration).** * **Use the qualities of materials to create suitable visual and tactile effects in the decoration of textiles (such as a soft decoration for comfort on a cushion).** * **Design with the user in mind, motivated by the service a product will offer (rather than simply for profit).** * **Make products through stages of prototypes, making continual refinements.** * **Ensure products have a high- quality finish, using art skills where appropriate.** * **Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices.** * **Create innovative designs that improve upon existing products.** * **Evaluate the design of products so as to suggest improvement to the user experience.** * Luxury, aesthetic, design, function, functionality, decorative, purpose , upholstery, embellishment, embroidery, applique, digital printing, hassock, headrest and bolster | | | * Discuss the aesthetic features of a cushion and its history. * Evaluate design features of decorative cushions and design features for those cushions designed for comfort. * Describe the different ways a cushion cover can be fastened and why certain types of cushions are fastened that way. * Explain the design with user in mind. * Describe the steps taken to complete cushion and continual refinements made to improve user experience. * Evaluate your cushion against aesethics of design. | |
| **Key vocabulary** | | | **Important Dates** | **Questions?** |
| **Aesthetics** | Design principle that defines a design’s pleasing qualities. In visual terms, aesthetics includes factors such as balance, colour, movement, pattern, scale, shape and visual effects. | | The earliest known use of cushions is around 7000BC, in the Mesopotamian civilisation. Both the fabric and the dye to colour it were very expensive so cushions became artworks that displaced a person’s taste and wealth  The work ‘cushion’ itself derives from the Middle English word ‘cushion’ as well as other terms from around the world like the Anglo-French term ‘cussin’. It was first used in the 14th century. | What should the success criteria be for a cushion cover fastening?  What design features would be found on cushions designed for decorative use? Why?  What design features would be found on cushions designed for comfort? Why?  Who will the cushion be for?  Will the cushion be functional or will the focus be aesthetic?  Why do you need a seam allowance?  How would you ensure invisibility techniques?  How are you to fasten the cushion?  What filling are you going to use in cushion?  Is your finsished cushion as you designed?  Can you recognise the techniques you hace used? Can you say how well your work was finishedt? Can you discuss the aesethics of your cushion? |
| **Functionality** | Practical and suitability for purpose | |
| **Upholstery** | Soft, padded textile covering that is fixed to furniture such as armchairs and sofas | |
| **Embellishment** | Decorative detail or feature added to something to make it more attractive: | |
| **Applique** | Ornamental needlework in which pieces of fabric are sewn or stuck on to a larger piece to form a picture or pattern | |
| **Headrest** | A padded part extending from or fixed to the back of a seat or chair, designed to support the head. | |
| **Bolster** | A long, thick pillow that is placed under other pillows for support | |
| **Hassock** | A cushion for kneeling on in church, while at prayer. | |  |  |

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| **TO MASTER PRACTICAL SKILLS** | **TO DESIGN, MAKE, EVALUATE AND IMPROVE** | **TO TAKE INSPIRATION FROM DESIGN THROUGHOUT HISTORY** | |
| **Class: 2 SPRING** | | **Title: ELECTRICS AND ELECRONICS** | |
| Learn about electricity, switches, batteries and bulbs. Electricity powers bulbs and keeps our lights on. It runs our televisions and computers, and makes our fridges work. Electricity can be turned off and on by switches, some things need batteries to work. Batteries store energy. But the energy in batteries does run out - these questions are about using electricity - create a simple circuit a wire goes from the battery to the bulb. Another wire goes from the bulb back to the battery. Look at a pair of light switches one off (0 ) and one on (1). Batteries have two ends. One end is called the plus (+) end. The other end (-) negative. Examine a range of batteries identify the two different ends. Check end of unit work end points. Children create circuit using makey makey, program using Scratch a simple piano, outputs to different pieces of fruit - which play different notes. | | | |
| **DT OBJECTIVES** | | **Unit of work end points** | |
| **Diagnose faults in battery- operated devices (such as low battery, water damage or battery terminal damage).**  **Design products that have a clear purpose and an intended user.**  **Make products, refining the design as work progresses.**  **Explore objects and designs to identify likes and dislikes of the designs.**  **Suggest improvements to existing designs.** | | **Sam has a remote control car. It is powered by a battery. What happens if the battery is flat?**  The car will go faster  The car will go slower  The car will not go  The car will spin  **.**Michael’s mobile is not working. The battery has run out. What should Michael do?  Buy another phone  Throw his mobile away  Recharge the battery  Give his mobile to a friend  Amy’s Mum is replacing an old light bulb. The new light bulb uses less energy. Why is this a good thing?  The new light bulb will cost less to run  The new light bulb is a funny shape  The new light bulb is a brighter colour  The new light bulb will use more energy  Lucy wants to watch a show on the telly. She presses the button on the remote control to turn on the television. But nothing happens. What is most probably wroearthng?  The TV show has finished  She has the wrong channel  The batteries in the remote control need replacing | |
| **Key vocabulary** | | **Important Dates** | **Questions?** |
| 1. **Battery** | 1. A battery is an energy source with terminals on both ends called an anode (-) and a cathode (+). | Joseph Swan was born on October 31, 1828 in Sunderland. A physicist and chemist, he helped to place the North East at the forefront of modern invention. His pioneering experiments with photography and electric lighting were revolutionary. Swan was knighted in 1904 for his work. He died on May7, 1914, | Where does the energy come from to make the bulb light up? If we take away one of the wires. What happens to the bulb? What happens if the switch is on O? What happens if the switch is on 1? Sam has a remote control car. It is powered by a battery. What happens if the battery is flat?  What happens if there is a break in the circuit with the makey makey? What happens if the circuit is not earthed? Can you play the fruit piano if the makey makey is not connected to the computer? What does the computer act as in the circuit? |
| **Positive** | Having a surplus supply of protons |
| **Negative** | Having a surplus supply of electrons |
| **Circuit** | An electrical circuit is a path or line through which an electrical current flows. |
| **Switch** | A simple on off switch . |
| **Electricity** | The flow of tiny particles called protons and electrons |

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| **TO MASTER PRACTICAL SKILLS** | | **TO DESIGN, MAKE, EVALUATE AND IMPROVE** | **TO TAKE INSPIRATION FROM DESIGN THROUGHOUT HISTORY** | |
| **Class: 3 SPRING** | | | **Title: FOOD TECHNOLOGY** | |
| Designers take inspiration from existing products. They think about a product’s purpose, its users and how it is designed. Examine the features of a vegetable soup. Designers must always keep safety in mind when they are making their products and when thinking about the user. Always check the ingredients and be aware of food allergies. Label and annotate different types of soup - use tin soup to look at different ingredients. Designers need to practise making things until their hands and fingers do things automatically, without much thinking. This is called fluency. By practising your hands and fingers will become fluent in chopping (claw grip), juicing, crushing, blending. *Practise using a juicer juice citrus fruits. Crush garlic in a garlic press. Design and create smoothies - use blender safely.* Design and make a vegetable soup of your choice, remembering to include:  1. a product overview sheet (think)  2. a mood board to give more detail about your inspiration (think)  3. a design sheet (think)  4. pictures of your product (make)  5. diagrams or pictures of how you tested your product (break)  6. diagrams or pictures of how you re-thought your design (Think what you could add to make the soup more substancial and modify your original recipe)  7. Diagrams or pictures of your improved design (make). Further thought -*• a vegetable soup using seasonal ingredients• a vegetable soup for someone who doesn’t like eating chunks of vegetables• a vegetable soup containing pulses• the cheapest vegetable soup you can make while maintaining taste.* | | | | |
| **DT Objective** | | | **Unit of work end points** | |
| **Prepare Food - Measure ingredients to the nearest gram accurately.**  **Design with purpose by identifying opportunities to design.**  **Make products by working efficiently (such as by carefully selecting materials).**  **Refine work and techniques as work progresses, continually evaluating the product design.**  **Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs.**  **Improve upon existing designs, giving reasons for choices.** | | | * **Use the claw hold, and experiment with chopping, peeling, grating and peeling different foods.** * **List foods that are best cut with a bridge hold or claw grip.** * **Draw and annotate diagrams of sliced and chopped foods, explaining the methods you have used to produce the best consistency for each type of food.** * **Experiment with recipes that include chopped, grated and diced foods.** * **Adapt your work as you go, making improvements.** * **Compare and contrast your first and most recent attempts at using different techniques.** * **Experiment with juicing different fruits and blending to make fruit smoothies.** * **Draw and annotate diagrams of your smoothies, explaining which ones you** * **preferred and why.** * **Explain why it is important to continually improve your work as you go.** | |
| **Key vocabulary** | | | **Important Dates** | **Questions?** |
| **Inspiration** | where you got your ideas from | | Cooking was the best thing that ever happened to the early man after the discovery of fire. The advancements in pottery allowed man to boil meat, grains, roots, and vegetables, instead of eating them using the roasting method. Submerging the food in water held more importance. It allowed the food to cook faster and thoroughly. It also provided for better flavours in the soup since the food would release its juices and make the soup tastier. | **Can you describe the safety features needs when preparing one of these dishes? Can you explain which smoothie did you prefer and whey?**  **Can you improve upon existing recipe? Can you change ingredients to suit user? Can you change amount of ingredients to suit one person? Can you identify each techniques you used and how? How could you make your soup more substancial? How could you modify your recipe?** |
| **Purpose** | the reason for which something is made | |
| **User** | the person for whom the product is designed | |
| **Automatically** | an automatic action is one that you do without thinking about it | |
| **Fluency** | if you are fluent in something you do it effortlessly accurate: | |
| **Juicing** | The liquid obtained from or present in fruit or vegetables | |
| **Crushing** | Apply pressure to break food own into smaller particles | |
| **Blending** | Process of combining two or more ingredients together so that they become smooth and uniform. | |
| **TO MASTER PRACTICAL SKILLS** | | **TO DESIGN, MAKE, EVALUATE AND IMPROVE** | **TO TAKE INSPIRATION FROM DESIGN THROUGHOUT HISTORY** | |
| **Class: 4 - 5 SPRING** | | | **Title: CONSTRUCTION** | |
| Discuss framed structures. Show different framed structures and discuss triangulation. Draw annotated diagrams showing the theory of triangulation. Practise skills - butt joints, mitre joints, struts and jointing plates (jinks corners). Design research - structures of roman catapults with annotated diagrams. Design specification - apply knowledge of frame structures and how the frames are made and joined using annotated diagrams to create 3D design. Evaluate finished product - Take a photograph of your finished product. Annotate your drawing by labelling the base, supporting arch and firing arm with bucket. Label the types of joints e.g. butt and mitre. Highlight struts and jinks corners used. Highlight the areas of triangulation in your finished catapult. | | | | |
| **DT Objective** | | | **Unit of work end points** | |
| Choose suitable techniques to construct products or to repair items.  Design with purpose by identifying opportunities to design.  Make products by working efficiently (such as by carefully selecting materials).  Refine work and techniques as work progresses, continually evaluating the product design.  Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs.  Improve upon existing designs, giving reasons for choices. | | | * Apply your knowledge of frame structures to make products. * Explain how the frames are made and joined, using annotated diagrams. * Experiment with a variety of 3-D shapes in your product | |
| **Key vocabulary**  an automatic action is one that you do without thinking about it;  fluency: if you are fluent in something you do it effortlessly  Pier - a solid structure supporting a bridge | | | **Important Dates**  The first bridge of a truss design was built in the 1840s, by Alfred Neville in France. However, this bridge used an isosceles triangle framework. The Warren truss bridge design was patented in Britain by James Warren and Willoughby Theobald soon after in 1848, with an equilateral triangle framework | |
| **Rigid** | * an object that is stiff and does not bend or change shape easily | | **Questions?**  What is the theory of triangulation?  • Define the word ‘rigid’.  • What is a truss?  • What is a strut?  • What is a joining plate?  Can you join square sectioned wood in a variety of ways?  How did they improve their designs, give reason for choices?  Can you list the materials you require?  Explain why you chose these materials?  Were you happy with how your catapult turned out?  What would you do differently next time? | |
| **Truss** | * a structure made of triangles (triangulation) | |
| **distribute** | * to share out | |
| **Strut** | * something that strengthens a structure | |
| **Joining plate** | * something attached to a joint to strengthen it | |
| **Pioneer** | * One of the first people to be involved in or developed something | |
| **Chord** | * The top or bottom of a truss structure | |
| **TO MASTER PRACTICAL SKILLS** | | **TO DESIGN, MAKE, EVALUATE AND IMPROVE** | **TO TAKE INSPIRATION FROM DESIGN THROUGHOUT HISTORY** | |
| **Class: 5 SPRING** | | | **Title: FOOD TECHNOLOGY** | |
| **Topic summary:** Discuss different types of healthy seasonal food. Describe a healthy menu for a main course and a dessert for one particular season. Discuss food types for different types of cultural events. Describe some traditional Christmas foods from across the world. List some food traditionally eaten at an Iftar. List some food eaten at Chinese New Year and explain the reasons behind the dishes. Describe some dishes that might be traditionally eaten at Diwali. What is traditionally eaten at Hanukkah? Describe any foods you have eaten from cultural events from across the world. Discuss food safety, hygiene rules and safe cooking. Design Research - investigate some simple bolognaise sauces for pasta. Label and annotate pictures of different dishes. Design Specification - Analyse how you might add more vegetables to a bolognaise sauce and modify your recipe. Explain your decisions when choosing your final ingredients. Make your dish and take photos of your finished dish. Evaluate your work - principles of a healthy meal, different cooking techniques uses and how your ingredients may change due to season. | | | | |
| **DT Objectives** | | | **Unit of work end points** | |
| **Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms).**  **Measure accurately and calculate ratios of ingredients to scale up or down from a recipe.**  **Demonstrate a range of baking and cooking techniques.**  **Create and refine recipes, including ingredients, methods, cooking times and temperatures.**  **Design with the user in mind, motivated by the service a product will offer (rather than simply for profit).**  **Make products through stages of prototypes, making continual refinements.**  **Ensure products have a high- quality finish, using art skills where appropriate.**  **Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices.**  **Create innovative designs that improve upon existing products.**  **Evaluate the design of products so as to suggest improvement to the user experience.** | | | Investigate different recipes for Bolognese sauce.  Investigate some simple sauces for pasta.  Analyse how you might add more vegetables to a Bolognese sauce.  Re-think your design decisions by applying your technical and practical knowledge of cooking and nutrition.  Modify your recipe.  Explain your decisions.  fruit" | |
| **Key vocabulary** | | | **Questions** |  |
| **User** | the person for whom the product is designed | | Describe a menu for a main course and a dessert for each season? Explain your choices.  Which foods are in season throughout the year?  Describe the safety features to be taken into account when preparing one of these  Dishes?  List the ingredients that one of the dishes is made from?  Describe some traditional Christmas foods from across the world.  List some food traditionally eaten at an Iftar?  List some food eaten at Chinese New Year and explain the reasons behind the dishes?  Describe some dishes that might be traditionally eaten at Diwali?  What is traditionally eaten at Hanukkah?  Describe any foods you have eaten from cultural events from across the world. | |
| **Purpose** | The reason for which something is made | |
| **Accurate** | if you do something accurately you do so without making mistakes | |
| **Presentation** | Visual presentation of finished food plated | |
| **Ingredients** | Food or substances needed | |
| **Microorganism** | Microscopic organism, especially a bacterium, virus, or fungus. | |
| **Preparation** | Getting everything ready | |
| **Hygiene** | Practise of maintain health and preventing disease | |
| **Sauté** | Fry quickly in a little fat | |
| **Nutrition** | Healthy food types and diet | |
| **Seasonal** | Food groups available at a particular season of the year | |

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| **TO MASTER PRACTICAL SKILLS** | | **TO DESIGN, MAKE, EVALUATE AND IMPROVE** | **TO TAKE INSPIRATION FROM DESIGN THROUGHOUT HISTORY** |
| **Class: 3 - 4 SPRING** | | | **Title: Mechanics** |
| **Topic summary:** Theory of linked levers, winding mechanisms and gears. Design, test, rethink, modify and evaluate model for either a linked leaver toy, winding mechanism -draw bridge or crane and gears in a fair ground ride. | | | |
| **DT Objectives** | | | **Unit of work end points** |
| **Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product linked levers, winding mechanisms and gears.**  **Design with purpose by identifying opportunities to design.**  **Make products by working efficiently (such as by carefully selecting materials).**  **Refine work and techniques as work progresses, continually evaluating the product design.**  **Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs.**  **Improve upon existing designs, giving reasons for choices.** | | | * Annotate drawings. * Test your design ideas to see if they work. * Re-think your design decisions by applying your technical and practical knowledge. * Modify your design. * Explain your decisions. |
| **Key vocabulary**  **Mechanical** Operated by a mechanical device | | | **Questions?** |
| **Pivot** | The point around which a lever turns | | Describe the purpose of linked levers?  • What does pivot mean?  • Define the word ‘fulcrum’?  • Describe the following types of movement:  1. linear  2. rotary  3. reciprocating  4. oscillating.  **IMPORTANT DATES**  2630–2610 BC USE OF LEVERS AND PULLEYS TO BUILD PYRAMIDS.   If the gear was born in Alexandria, it was much fostered in its youth by Archimedes of Syracuse (ca 287-212 B.C.), the greatest mathematician of the Greeks. |
| **Fulcrum** | The point at which a lever balances or turns | |
| **Linear** | In a straight line | |
| **Rotary** | Turning around a fixed point | |
| **Reciprocating** | Moving back and forth in a straight line | |
| **Oscillating** | Moving back and form in an arc | |
| **Inspiration** | Where you get your ideas from | |
| **Purpose** | The reason for which something is made | |
| **Gear** | A  toothed wheel that works with others to alter the relation between the speed of a driving mechanism | |
| **Lever** | A simple machine consisting of a beam or rigid rod pivoted at a fixed hinge | |
| **Winding mechanism** | Manual winding | |
| **Rotary** | Revolving around a centre or axis; rotational | |
| **Axle** | a rod or spindle (either fixed or rotating) passing through the centre of a wheel or group of wheels | |