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| **TO MASTER PRACTICAL SKILLS** | **TO DESIGN, MAKE, EVALUATE AND IMPROVE** | **TO TAKE INSPIRATION FROM DESIGN THROUGHOUT HISTORY** |
| **Class: 6 AUTUMN** | **Title: Electrical and Electronics** |
| **Topic summary:** Create circuits using Raspberry Pi a small computer that employs a number of components including switches, resistors, and LEDS. Create programs to control the LEDS to create various light shows. |
| **DT Objectives** | **Unit of work end points** |
| * Create circuits using electronics kits that employ a number of components (such as LEDS, resistors transistors and chips).
* **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.**
 | * Apply your knowledge of circuits to make products and your knowledge of programming to control them
* Explain the difference between hardware and software
* Explain the inputs, processes and outputs in your programs.
* Experiment with a variety of different ways to create a circuit that makes an LED light up
* Combine control of 6 LEDS to create various light shows

Deeper learning: Investigate encryption and code breaking. Focussing on decomposition, problem solving and collaboration skills  |
| **Key vocabulary** | **Important Dates**  | **Questions?** |
| **Secure Digital (SD) card**  | The Operating system for the Pi. This helps to turn it from a bunch of hardware into a computer using software, | Sir Joseph Wilson Swan was a British scientist of the 19th and early 20th centuries, who is famous for inventing the incandescent light bulb and was local to this area. | What is the difference between software and hardware?Can you create the algorithm for your circuit?What are the two states of a switch?When the switch is open is the circuit off or on?Why is the circuit known as AND?Why is the circuit known as an ORR?How can we use the broadcast command to trigger events?Can you draw an annotated drawing of your circuit?Describe the difference between an ‘and’ and ‘orr’ circuit? |
| **Breadboard**  | Piece of plastic that houses lots of strips of metal. These metal strips are used to transfer electrons around a circuit. |
| **Mounting Board** | Pi and Breadboard should be attached to this. |
| **GPIO Map**. | Map placed over the GPIO pins |
| **Resistors**  | Used to make the voltage appropriate for certain components.  |
| **LEDs**  | Light emitting diodes - .are diodes that emit light when electrons pass through |
| **Switches**  | Control the flow of electrons around a circuit. |
| **TO MASTER PRACTICAL SKILLS** | **TO DESIGN, MAKE, EVALUATE AND IMPROVE** | **TO TAKE INSPIRATION FROM DESIGN THROUGHOUT HISTORY** |
| **Class: 5 AUTUMN** | **Title: Materials** |
| **Topic summary:** Research the use of containers used by the Anglo Saxons and in modern day life. Investigate materials used and alternative modern day materials. Design a money container which has multi uses and with user in mind. Create pattern using CAD and make product through stages of prototype – evaluating and improving design, experiment with 3D prototypes. Using leatherette roughly cut around pattern with sharp scissors and then precision cut using Stanley blade and metal rule. Measure and create holes in leather with punch and then whip stitch pieces together. Ensure money container has a high quality finish, evaluate design and suggest improvements. |
| **DT Objectives** | **Unit of work end points** |
| * **Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape).**
* **Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper).**
* **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.**
 | * Apply knowledge of research of Anglo Saxon money containers and modern day design to create design specification.
* Explain the benefits of creating 3D protypes.
* Explain your decisions of design by evaluating the end product.
 |
| **Key vocabulary** | **Important Dates**  | **Questions?** |
| **Prototype** | An earlier model or sample of end design | That the **Anglo Saxons** had a purse to carry their coins, usually attached to a wide leather belt. •. That the purpose of a purse/wallet is to hold **money**. ‘Sutton Hoo’ Purse – the purse contained 37 gold coins dated around AD613. | Which design have you chosen? Why?Have you used more than one pattern piece?Can you create a 3D mock up?How could you ensure a more precise cut?How are you going to join the two pieces of material together?What could I do to make it easier to cut out the design?  |
| **CAD** | Computer Aided Drawing |
| **Leatherette** | Alternative to genuine leather |
| **Whip stitch** | Place two pieces of fabric together and join by stitching through and over the top of fabric pieces |
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| **TO MASTER PRACTICAL SKILLS** | **TO DESIGN, MAKE, EVALUATE AND IMPROVE** | **TO TAKE INSPIRATION FROM DESIGN THROUGHOUT HISTORY** |
| **Class: 3 - 4 AUTUMN** | **Title: Textiles** |
| **Topic summary:** Design a decorative fabric hanging for a tree. Use various stitches to decorate the hanging. Creating seam allowance to combine textiles. |
| **DT Objectives** | **Unit of work end points** |
| * **Understand the need for a seam allowance.**
* **Textiles - Join textiles with appropriate stitching.**
* **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 sewing techniques to design winter motif.
* Explain reason for seam allowance.
* Combine textiles together using knowledge of sewing techniques.
 |
| **Key vocabulary** | **Important Dates**  | **Questions?** |
| **Binca** **Swam allowance** | Cotton fabric for needlework The distance between the seam stitching line and the cut edge of the fabric. | Tradition of decorating Xmas trees - Prince Albert and Queen Victoria. | Can you follow the pattern?Can you work efficiently and continually evaluate your work?How could you improve your work? |

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| **TO MASTER PRACTICAL SKILLS** | **TO DESIGN, MAKE, EVALUATE AND IMPROVE** | **TO TAKE INSPIRATION FROM DESIGN THROUGHOUT HISTORY** |
| **Class: 3 AUTUMN** | **Title: Materials** |
| **Topic summary:** Discuss evolution of fabrics and clothing. Examine closely a piece of scrim fabric identifying the weft and warp threads. Discuss how a spider’s web was the inspiration of design for Kente cloth. 1. Children create their own design for weaving using the Kente principals for shape and colour. Measure and mark to the nearest millimetre the grid on a weaving board and cut slots with special shaped cardboard scissors. Discus joining techniques to create weft and warp threads. 2. Create grid around board by measuring to nearest mm, hammer in nails to create border frame. Then joining yarn and other fabrics to pin board create their own modern interpretation of a spider’s web. |
| **DT Objectives** | **Unit of work end points** |
| * **Cut materials accurately and safely by selecting appropriate tools.**
* **Measure and mark out to the nearest millimetre.**
* **Select appropriate joining techniques.**
* **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 knowledge of colours and pattern used in Kente cloth.
* Explain the difference between weft and warp threads ,
* Experiment with appropriate joining techniques.
* Combine measuring and cutting skills to create looms.
* Evaluate and improve designs giving reasons for choice.
 |
| **Key vocabulary** | **Important Dates**  | **Questions?** |
| **Weft** | Thread that goes left to right and vice versa | About 375 years ago, two brothers from Bonwire, a village in the Ashanti region of Ghana were said to have gone hunting one afternoon when they came across a spider spinning a web. According to legend, the two, Krugu Amoaya and Watah Kraban, were amazed by the beauty of the web and decided to create something similar to it. When they returned home, the two weaved the first cloth out of black and white fibres from a raffia tree. | * How do the threads stay together?
* What will happen if I pull out this thread?
* Do you know any other fabric names which have been woven like this?
 |
| **Warp** | Thread that goes up and down and vice versa |
| **Scrim** | A **scrim** is a woven material, |
| **Weave** | by interlacing long threads passing in one direction with others at a right angle to them. |
| **Loom** | The **loom** works by having a rigid heddle reed which the warp yarns (the yarn that goes onto the **loom**) are threaded alternately through a series of slots and eyes. |
| **Disassemble** | To take apart |
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| **TO MASTER PRACTICAL SKILLS** | **TO DESIGN, MAKE, EVALUATE AND IMPROVE** | **TO TAKE INSPIRATION FROM DESIGN THROUGHOUT HISTORY** |
| **Class: 1 AUTUMN** | **Title: Materials** |
| **Topic summary:** A structure is something that is made either in nature or by people. There are four main types of structure: shell structures, frame structures, solid structures and combined structures. Following on from the children’s introduction to seasons and animal hibernation. The children create a hedgehog habitat using different materials. |
| **DT Objectives** | **Unit of work end points** |
| * **Cut materials safely using tools provided.**
* **Measure and mark out to the nearest centimetre.**
* **Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling).**
* **Materials**
* **Demonstrate a range of joining techniques (such as gluing, using hinges or combining materials to strengthen).**
* **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.**
 | * List the four types of structure. • Name five examples of each of the four types of structure.
* Define the word ‘natural’.
* Name ten natural structures.
* Define the word ‘manufactured'.
* Name ten manufactured structures.
* List four reasons why people might manufacture structures
 |
| **Key vocabulary** | **Important Dates**  | **Questions?** |
| **Structure** | something made either in nature or by people |  | What modelling techniques can we use to create a structure that can be used as a shelter for a hibernating animal? |
| **Nature** | all things not made by people |  | How can we use natural found materials to finish of our product? |
| **Combined**  | Put together |  | Do our hedgehog houses meet out design brief? |
| **Manufactured** | Made by people |  | What skills do we need to practise to improve our making skills? |
| **Protect**  | To keep something safe |  |  |
| **Span** | To stretch across a space |  |  |
| **Connected**  | Joined or linked together |  |  |
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| **TO MASTER PRACTICAL SKILLS** | **TO DESIGN, MAKE, EVALUATE AND IMPROVE** | **TO TAKE INSPIRATION FROM DESIGN THROUGHOUT HISTORY** |
| **Class: 2 AUTUMN** | **Title: Textiles** |
| **Topic summary:** Design colour and dye their own fabric. Create circular template and then cut around template and using running stitch draw fabric in around polystyrene sphere. Decorate sphere to their own design to create winter bauble. |
| **DT Objectives** | **Unit of work end points** |
| * **Shape textiles using templates.**
* **Join textiles using running stitch**
* **Colour and decorate textiles using a number of techniques.**
* **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.**
 | * Apply knowledge of natural dyes to dye fabric
* Explain why we create a template
* Explain reasons for choice identifying likes and dislikes
 |
| **Key vocabulary** | **Important Dates**  | **Questions?** |
| **Template****Dye** | a shaped piece of rigid material used as a patternto change the colour of something using a special liquid | **Natural dyes come from animal or plant sources** while synthetic dyes are manmade. Until 1856, if you were trying to dye clothing, you would have had to use natural dyes. | How do we make a white sheet a different colour?What did people use in the past?Do we still use vegetables to dye?How can we create a template? |
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| **TO MASTER PRACTICAL SKILLS** | **TO DESIGN, MAKE, EVALUATE AND IMPROVE** | **TO TAKE INSPIRATION FROM DESIGN THROUGHOUT HISTORY** |
| **Class: 4 AUTUMN** | **Title: Textiles** |
| **Topic summary:** Design and create a fidget mat using sewing skills. End user adult with dementia. Discuss needs of target audience. Fidget mat for Adults- for Seniors with Dementia, Alzheimer´s, Autism and Memory or Motor Challenges - Sensory Stimulation and Memory Care Activity. |
| **DT Objectives** | **Unit of work end points** |
| * **Understand the need for a seam allowance.**
* **Textiles - Join textiles with appropriate stitching.**
* **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 sewing techniques to design a fidget mat.
* Combine textiles together using knowledge of sewing techniques.
* Discuss what tactile properties you included.
 |
| **Key vocabulary** | **Important Dates**  | **Questions?** |
| **Felt****Seam allowance****Sensory****Tactile** | Press Felt is a textile material that is produced by matting, condensing and pressing fibres togetherThe distance between the seam stitching line and the cut edge of the fabric.Relates to the physical senses of touch, smell, sight, taste and hearing,Connected to the sense of touch. |  | Who are you designing your mat for?Can you identify what sensory/tactile features are included in your fidget map?What senses will be triggered? |

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| **TO MASTER PRACTICAL SKILLS** | **TO DESIGN, MAKE, EVALUATE AND IMPROVE** | **TO TAKE INSPIRATION FROM DESIGN THROUGHOUT HISTORY** |
| **Class: 1/2 AUTUMN** | **Title: Materials** |
| **Topic summary:** A solid structure is one that is made from either one solid object or lots of solid objects joined together. Stone and brick structures are joined together with mortar. Unlike shell structures, solid structures are not usually hollow; they can be very strong. Examine how a brick wall is built and arranged. **Solid Structures – Strength.**  • Make brick walls using a stacked bond.• Remove bricks from the lower course and describe what happens.• Make brick walls using a running bond.• Remove bricks from the lower course and describe what happens.• Draw annotated diagrams of what happened to the walls.• Use construction sets to build solid structures.**Solid structures – Stability**• Define the word ‘stable’.• Define the word ‘balanced'.• What is an architect?• Make three towers: one with a narrow base, one with a wider base and another with a very wide base. Put the towers on a piece of paper and then move thePiece of paper, as if there was an earthquake, and describe what happens to the towers.• Draw annotated diagrams of what happens to each tower.**Task**Apply your knowledge of solid structures to make stable models.Explain why the models are stable, using annotated diagrams.Experiment with a variety of different solid shapes in your structures. |
| **DT Objectives** | **Unit of work end points** |
| * **Cut materials safely using tools provided.**
* **Measure and mark out to the nearest centimetre.**
* **Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling).**
* **Materials**
* **Demonstrate a range of joining techniques (such as gluing, using hinges or combining materials to strengthen).**
* **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.**
 | • Define 'a solid structure’.• What does it mean if a structure is hollow?• List five examples of a natural solid structure.• List five examples of a manufactured solid structure.• What is mortar?  |
| **Key vocabulary** | **Important Dates**  | **Questions?** |
| solid:mortar:hollow:dam: **bond** | Made of objects that have little or no space inside thamCement used to join bricks or stones togetherSomething that has space inside itA wall used to block a riverhow bricks are arranged | . | What is an architect?What does it mean if a structure is hollow?What is mortar? |
| **TO MASTER PRACTICAL SKILLS** | **TO DESIGN, MAKE, EVALUATE AND IMPROVE** | **TO TAKE INSPIRATION FROM DESIGN THROUGHOUT HISTORY** |
| **Class: 4 - 5 AUTUMN** | **Title: Textiles** |
| **Topic summary:** Design and create a fidget mat using sewing skills. End user adult with dementia. Discuss needs of target audience. Fidget mat for Adults- for Seniors with Dementia, Alzheimer´s, Autism and Memory or Motor Challenges - Sensory Stimulation and Memory Care Activity. |
| **DT Objectives** | **Unit of work end points** |
| * **Understand the need for a seam allowance.**
* **Textiles - Join textiles with appropriate stitching.**
* **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 sewing techniques to design a fidget mat.
* Combine textiles together using knowledge of sewing techniques.
* Discuss what tactile properties you included.
 |
| **Key vocabulary** | **Important Dates**  | **Questions?** |
| **Felt****Seam allowance****Sensory****Tactile** | Press Felt is a textile material that is produced by matting, condensing and pressing fibres togetherThe distance between the seam stitching line and the cut edge of the fabric.Relates to the physical senses of touch, smell, sight, taste and hearing,Connected to the sense of touch. |  | Who are you designing your mat for?Can you identify what sensory/tactile features are included in your fidget map?What senses will be triggered? |