Edward Peake C of E VC Middle School

Medium Term Plan

Subject: Design Technology	Unit: Push Together Torch	Term/Duration: Rotation 10 – 12 weeks	Year Group: 5

Prior Learning:

- · That all products have been designed to a set of criteria.
- · That research is done into what the user likes before designs are drawn.
- How to produce design ideas working to a design brief.
- · That safety rules need to be followed when working with tools.
- · That there is a sequence of steps to follow to make a product.

Key Vocabulary:
Light Emitting Diode
Coin cell battery
Positive
Negative
Polarised
High Impact Polystyrene
Prototype
Evaluation

By the end of this unit…

All pupils will be able to:
Know there are 2 main sources of power and be able to give some examples.
Know what needs to be thought about before the torch can be designed.
Produce 2 ideas for the torch with some colour and simple labels.
Make a prototype of your chosen torch and write a simple www and ebi.
Use the tools correctly and safely to cut out the different parts of the casing of the torch.
Know the main stages of making the torch.
Think about what went well and areas that you could improve on when making the torch.

Most children will have made more progress; they will be able to:.
Name the components being used in the torch. Be able to draw circuit diagrams for the torch.
Write a list of requirements the torch must meet.
Have 2 different design ideas that consider where the LED and battery are positioned.
Understand what a prototype is.
Be able to fit the components within the torch in the correct positions.

Edward Peake C of E VC Middle School

Medium Term Plan

Know which tools and materials are needed at each stage of making the torch. Collect other people's opinions of your finished torch.
***Some children will have progressed further; they will be able to*:** Understand the components are polarised and need to fit a certain way round in the circuit. Explain why it is important for the torch to meet the requirements. Explain why it is important to make a prototype of the torch. Be accurate in the assembly of the torch. Explain in detail how to make the torch, including information about the tools and materials needed. Recall information about how the electronics of the torch work. Explain what modifications (changes) would need to be made if the torch was made again.
♦ ***Notes:***

	Learning Objectives	**Content**	**Assessment**	**Resources /Health and Safety**	**ICT Opportunities**
1	To understand the electronics used in the torch. To be able identify what needs thinking about before the torch is made.	Starter - What is this? How do you think it will work? Students look at the picture on the powerpoint and feedback what they think the product is and how they think it will work. Explain the picture is the product they will design and make, their's will work in the same way but will be their own design. Discuss there are two main sources of power battery and mains and how rechargeable batteries are recharged by plugging them into the mains. Show	Highlight learning objective, must, should or could in the booklet. Tables and circuit diagram in the booklet.	Year 5 Push together torch powerpoint Printed work booklet Example torch LEDs Coin cell batteries	

		students the images of the products and ask them to think, pair, share. Ask students if they can think of any other battery and mains powered appliances and use random questioning for them to feedback. Show students the components that they will use in the torch and access previous knowledge with hands up questioning. Discuss the uses of the components and explain about them being polarised components. Give students examples of the components and explain how you can tell the difference between the positive and negative sides. Students fill in the table in their work booklets about the components. Ask students if they know what conductors and insulators are (think, pair, share). Students complete the table in their work booklets about conductors and insulators giving examples of each. Explain how many making an electrical product the instructions of how to connect the components together are presented as an circuit diagram. Discuss how the circuit for the torch works and how the pressing together of the two sides connects the legs of the LED to the battery and acts as a switch completing the circuit and turning the torch on. Show how to draw the symbols for the components being used for the torch. Students draw the symbols into their work booklet and then complete the circuit diagrams with the switch in		H&S - see Room 5 risk assessment	

Edward Peake C of E VC Middle School

Medium Term Plan

		the on and off position. Underneath students explain how the circuit works. Recap what a design brief is and read through the brief for the project. Students fill in the mindmap in their booklets about what they need to think about before designing the torch. Use random questioning for students to feedback what they have put on the mindmap. Give students time to add to their mindmap. Recap knowledge learnt about components through random questioning.			
2	To be able to write a specification for the torch including reasons for the points. To be able to produce design ideas for the torch.	Starter - Picture of an LED and coin cell battery - questions - What are these? What do they do? Which two sides need to be connected together? Recap on what needs to be thought about before making the torch. Use random questioning to find out what a specification is and how it is written. Discuss the main points that need to be included in the specification, these should link to the points on the mindmap. Model how to write the first point of the specification focusing on the point and the reason. Students write the specification in their work booklet. Monitor students progress as they write the specification and give assistance as required. Explain and model how to produce the design ideas. Recap on drawing in pencil, colouring in coloured pencil, labelling the design decisions, labelling how the design links to the points of the specification,	Highlight learning objective, must, should or could in the booklet. Specification Design ideas	Year 5 Push together torch powerpoint Printed work booklet Example torch Coloured pencils H&S - see Room 5 risk assessment	

		explaining the points in the labelling. Remind students there needs to be space for the battery and the legs of the LED need to be able to reach the battery. Monitor students progress as they produce their ideas giving assistance as required. Discuss identifying the strengths and weaknesses of the designs. This should focus on how well they work as a torch not on the neatness of drawing, colouring etc. Students evaluate the strengths and weaknesses of their designs in their work booklets. Students explain which idea they plan to make and why.			
3	To be able to produce a prototype of the torch. To be able to use hand tools to make the push together torch. To be able to make a working circuit.	Starter - What does polarised mean? How can you tell which the positive and negative sides of these components are? Discuss what a prototype is and what it is used for. Demonstrate how to make a prototype of the torch from card and how to check the positioning of the battery and LED and how successful it is. Discuss what you have found out from making the prototype and what would need changing before making the final torch and why. Students make a prototype of their torch and check the positioning of the LED and battery. Students glue the prototype into their booklets and write what they have found out by making it and what changes they would need to make. Use hands up questioning to find out what students know about peer assessment. Explain the peer assessment task of the torch prototype.	Highlight learning objective, must, should or could in the booklet. Prototype and findings	Year 5 Push together torch powerpoint Printed work booklet Example torch Card Pritt stick Scissors LEDs Coin cell batteries High impact polystyrene Foam H&S - see Room 5 risk assessment	

Edward Peake C of E VC Middle School

Medium Term Plan

		Model peer assessing your prototype, explain the prototype is being assessed against working towards, working at and exceeding and what each of these would look like for each of the assessment points. Discuss how to write a target for improvement and a www that is useful. Students carry out a peer assessment of their partners prototype. Explain which materials are being used to make the torch and why these are suitable. Demonstrate marking out the shape of the torch onto the high impact polystyrene (HIPS) and foam and how to cut it out. Demonstrate how to position the coin cell battery onto the foam focusing on the positioning of the negative leg of the LED, draw around the coin cell battery and cut the circle from the foam. Students draw the shape of their torch onto the HIPS and foam and mark out the position of the battery on the foam. Students cut out the pieces. Monitor students progress and give assistance as required. Recap on the components and materials being used and why they are suitable.		Focus on safe use of scissors.	
4	To be able to use hand tools to make the push together torch. To be able to make a working circuit.	Starter - What components are these circuit symbols of? Recap on the stages of cutting out the high impact polystyrene (HIPS), foam and hole for the coin cell battery. Demonstrate how to attach the HIPS to the foam with double sided tape, how to insert the battery and LED	Highlight learning objective, must, should or could in the booklet. Completed torch Record of production	Year 5 Push together torch powerpoint Printed work booklet Example torch Double sided tape	

Edward Peake C of E VC Middle School

Medium Term Plan

	To be able to recall information about the tools and skills needed to make the torch.	reminding students of the way to connect them and join the two sides together. Explain that the design for the outside of the torch is going to be produced on sticker paper. Demonstrate how to draw around the torch to get the shape focusing on the fact one piece needs to be the mirror of the other. Students work through the stages of making the torch. Monitor students progress and give assistance as required. Discuss how to fill out the production record for making the torch. Explain how a plan of production is usually made before making a product and why. Recap on the tools and equipment needed to make the torch and the stages of production. As students complete their torch they can work through filling out the production plan.		Pritt stick Scissors LEDs Coin cell batteries High impact polystyrene Foam H&S - see Room 5 risk assessment Focus on safe use of scissors.	
5	To be able to recall information about the tools and skills needed to make the torch. To be able to evaluate the finished torch.	Starter - Why is it important to carry out an evaluation? Think, pair, share. Recap using random questioning the stages of making the torch and the tools and equipment needed at each stage. Discuss why safety is important when making the torch and what risks need to be considered. Students complete the record of production in their work booklet and answer the question on safety. Monitor student progress and give assistance as required.	Highlight learning objective, must, should or could in the booklet. Record of production Evaluation	Year 5 Push together torch powerpoint Printed work booklet Completed torches H&S - see Room 5 risk assessment	

Edward Peake C of E VC Middle School

Medium Term Plan

		Students answer the questions on components and how the torch works in their booklets. use random questioning to go through the answers. Recap why it is important to carry out an evaluation. Explain how to do an evaluation against the specification, using the points written in the specification. Discuss how this can show you what improvements could be made to the torch if you were to make it again. Students work through their evaluation against the specification in their work booklets. Monitor student progress and give assistance as required.			