



SS John Fisher & Thomas More Catholic Primary School

A Voluntary Academy

"Journeying together with Jesus Christ, we learn to love and love to learn."



Medium Term Planning Creative Learning Journey

Year Group: 4	Topic: Design and Technology - Pulleys	Term: Autumn 1
National Curriculum Links (Ref: NC 2014) <ul style="list-style-type: none">To design, make and evaluate their product within a relevant context.Generate and develop a design criterion informed by relevant research - annotated sketches.Use a wide range of materials to produce their design.Evaluate their product against the design criteria.Understand and use mechanical systems in their products - pulleys.		
Knowledge and Skills Objectives	Activity	Differentiation
Week/Lesson One LO: I can identify components of a pulley and understand how it works.	1) Children will discuss a series of images on their tables. Does the object move? Which direction does it move in? How does it move? Does it move using an electric motor or human force? Gather children's thoughts and ideas as a whole class. What have they found? Can they identify any similarities or differences between the movements of the items? Share our long-term goal with children: 2) Explore the term mechanism and introduce pulleys. Explain that using a pulley system will help us make our bridges effective. Watch the YouTube video to support understanding (first section) - https://www.youtube.com/watch?v=jtk2V0M6k3M Discuss video and recap key vocab - axle, wheel, groove, lever, mechanism, load, force. Label these on a diagram.	SEN - Label the parts of a pulley on a sheet and identify things that use a pulley. LA - Label the parts of a pulley and write the role each part has within the mechanism. Identify things that use a pulley. MA - Draw and label the parts of a pulley and write the function of each part. Identify things that use a pulley HA - Draw and label the parts of a pulley and write the function of each part. Identify one thing that uses a pulley and write how the pulley is used to help the item work.



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	<p>Look at the diagram of the escalator. Can they identify the pulley system at work? How is it working? Where are its features? Have a look at the types of pulley systems and identify how they differ. Set children off on task.</p>	<p>Extension: (Challenge cards) Children to explain the purpose of the pulley system in the image on the card.</p>
<p>Week/Lesson Two LO: I can explore how an axel is used to make a pulley. I can begin to think of ways I can create a pulley for my bridge.</p>	<p>Recap learning from last lesson. Ask for a volunteer to come to the board and face the class. A keyword will appear on the board behind them and the class must give the child clues to identify the correct keyword.</p> <p>What is the purpose of a pulley? Does the amount of human effort/force increase or decrease when more pulleys are applied? https://www.youtube.com/watch?v=Nj4J7QNeBNk – Video can be played to recap prior learning.</p> <p>Introduce children to the different types of pulley systems that there are (fixed, movable and compound). Can they guess how that pulley system might work? Discuss their functions.</p> <p>Explain today's activity and show them a model example of what it could look like. Encourage children to explore with the materials and be creative in finding a pulley system that may be suitable for their own drawbridge - Discuss safety aspects of working with the materials e.g. the skewers, scissors etc.</p>	<p>In mixed ability pairs or small groups of three, children can explore making a pulley. They may choose to create one of the pulley systems we learned about today. Explain to children that a help sheet is available to guide them in creating a pulley if they wish to use it.</p>
<p>Week/Lesson Three LO: I can create a design criteria. I can plan a design for my bridge.</p>	<p>Place a selection of images of drawbridges onto the children's tables. Explore them with the children, what is the purpose of these bridges? How do they function? How do they differ in design/appearance? Watch video from 1m52s https://www.youtube.com/watch?v=UkKTMoXxy0s - has anyone's ideas changed?</p>	<p>Place children into mixed ability groups of 4. Children can work in their team to discuss and share their ideas. They should record the types of materials and equipment they may use. Children should discuss and confirm their</p>



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<p>I can sketch and annotate my design.</p>	<p>Gather and share ideas as a class. Introduce LO and show children a video of a drawbridge being constructed to spark their creativity and secure understanding - https://www.youtube.com/watch?v=Ah-l88JAAaE What makes them effective? Begin to develop a design criteria with the children e.g. The bridge needs to be...</p> <ul style="list-style-type: none">- Sturdy and can support itself when standing- An appropriate shape, size and structure- Functional: contains a mechanism that allows the bridge to open and close <p>You could mindmap or list ideas on the board. Ask the children which materials/equipment would be suitable for when we create our own bridges. Why would those materials work? Introduce children to the designing process. You could have an A3 version of their planning sheet and model the process to the class. Send chn off on task in their groups.</p>	<p>design criteria for their drawbridge. They can then begin to sketch a step-by-step process for their design.</p>
<p><u>Week/Lesson Four</u> LO: I can begin to construct my drawbridge. I can make a drawbridge that has a pulley system.</p>	<p>Quickly recap the types of materials and equipment we can use to construct our drawbridges. Give children time to work in their groups to complete their design sheets from last lesson if needed. What is the most important aspect of your drawbridge? Why? What is its purpose? How are you going to start making your drawbridge? As a class discuss some of the steps involved in creating a drawbridge. Discuss roles and responsibilities whilst working in groups - taking turns, sharing equipment, ensuring all members have something to do. Children can be given roles within their team e.g. evaluator, equipment manager etc.</p>	<p>In their mixed ability groups children can begin to make their drawbridge. Children should be aware of the safety rules whilst working with a range of equipment and materials. Children should also be mindful of working as part of a team.</p>



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I can work as part of a team.	Recap safety rules with children before they begin making their drawbridges e.g. being sensible when working with hot glue guns etc.	
<u>Week/Lesson Five</u> LO: I can make a drawbridge that has a pulley system. I can use key vocabulary to describe my process.	Discuss safety rules as last week and provide children time to continue to construct their drawbridges. Encourage children to change/adapt their design if they are unhappy with any elements of their drawbridge. Explain that they now have the opportunity to make those changes before they evaluate their creations next week.	In their mixed ability groups children can begin to make their drawbridge. Children should be aware of the safety rules whilst working with a range of equipment and materials. Children should also be mindful of working as part of a team.
<u>Week/Lesson Six</u> LO: I can evaluate the effectiveness of my drawbridge against my success criteria.	Display the children's bridges around the classroom with two sets of post-its next to each one. Send groups round (carousel) to observe the other bridges and try their pulleys (without damaging them). They can then write positive comments about the bridge on a (green) post-it and then how it could be improved on a (pink) post-it. All children to have a look at each bridge. Come back together as a class and discuss ideas. (This will help the children complete their independent evaluations of their bridge). Recap the purpose of a drawbridge - what should they be able to do? Discuss what makes the drawbridge effective and children's success criteria. Model evaluating the bridge against the success criteria.	<u>LA</u> - Evaluate their drawbridge against their success criteria using a smiley face. They should also identify one suggestion of how their drawbridge could be improved if they did the project again. <u>MA/HA</u> - Children should evaluate their drawbridge against their success criteria using a smiley face and explain why they have chosen that face e.g. the bridge might not have supported itself for long - poor structure, the pulley system consisted of all it's features which allowed the bridge to work effectively etc.



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		They should then identify two areas that they could change to improve their drawbridge next time.
<u>Applied Write Opportunities:</u>		
<u>Key Vocabulary</u> Pulley, wheel, axel, groove, load, force, rope, combine, construct, design, sketch, annotate.		