



MEDIUM TERM PLANNING

Subject	Topic/Key Question	Year Group	Term	Time Allocation
Design and Technology	Fairgrounds	6	Autumn 1	6 hours
End of upper Key Stage 2 objectives	<p>Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups</p> <p>Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</p> <p>Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately.</p> <p>Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.</p> <p>Understand how key events and individuals in design and technology have helped shape the world</p>			
Mechanical Systems				
End of unit objectives	<p>I can identify the moving parts of a rotating ride/object.</p> <p>I can create a detailed diagram of my chosen ride/object.</p> <p>I can go some way to explaining how I think a ride/object is powered and/or built.</p> <p>I understand how pulley and belt systems can be used to transfer movement.</p> <p>I can describe how an electrical circuit with a motor can be used to create rotating parts.</p> <p>I can manipulate my pulleys to create different movements.</p> <p>I can describe ways of strengthening and reinforcing structures.</p>			

	<p>I can suggest ways in which ideas for frameworks could be developed to ideas for my own fairground ride designs.</p> <p>I can use a variety of materials and components accurately.</p> <p>I can make a decision about what kind of ride they will make.</p> <p>I can design an appropriate electrical circuit for their ride.</p> <p>I can describe the process I will need to go through to successfully complete my product.</p> <p>I can evaluate a finished product fairly.</p> <p>I can suggest ways they could improve my product if I were to make it again.</p> <p>I can recognise ways in which I have been successful.</p>	
Vocabulary	Design	Range of ideas, Collect information, Different sources, Produce, Detailed, Step by step plan, Explain, Appeal, Specific audience, Product, Design, Pulleys, Gears, Users view
	Make	Use, Make, Specific tool, Specific task, Correctly, Safely, Explain, Specific action, Change work, Precise, Accurate
	Evaluate	Test, Evaluate, Explain, How, Know, Clear criteria, Decide, Fit for purpose, Improve, Evaluate resources, Justify, Selected materials
	Mechanical Systems	Mechanisms, Enhance a given product, Circuit, Adding a circuit, Improve their product, Electrical system, Switch, Bulb, Motor, Wire

Lesson Sequence	Time Allocation	Key Question/WALT	Teaching Activities	Resources
Lesson 1	1 hour	To look at a range of existing fairground rides	How many different fairground rides have you been on? What were they like? How did they move? Invite children to share their ideas	Planbee

		<p>and investigate how they move.</p>	<ul style="list-style-type: none"> • Show the children the provided video, asking them to comment on how the ride moves, where the passengers are situated and how the ride is structured so it stays standing. Ask questions for each of the different rides: How does the ride move? Can you see the mechanism that moves or turns the ride? How are the components joined together? • Look at the different pictures of fairground rides on the slides. Ask questions for each of the different pictures: How does the ride move? Can you see the mechanism that moves or turns the ride? How are the components joined together? • Explain that lots of fairground rides and other everyday objects use electric motors to make them work. Show children the picture of the circuit with a motor on. How does the motor work? Children to think, pair, share their ideas. How many other objects can you think of that might use an electric motor to make parts rotate? Children to discuss ideas with a partner then share with the class <p>Activity</p> <p>Ask children to sketch one of the fairground rides from the Picture Cards and ask them to label how the rotating parts work on each ride on worksheet IB</p> <p>Questions for assessment</p> <p>Can children identify the moving parts of a rotating ride/object?</p> <ul style="list-style-type: none"> • Are children able to create a detailed diagram of their chosen ride/object? • Can children go some way to explaining how they think a ride/object is powered and/or built? 	<p>slides Fairgrounds Lesson 1 Video Picture Cards Worksheet IA/IB/IC Variety of objects with rotating parts (FSD? activity only) Large sheets of paper (FSD? activity only) Optional - screwdrivers</p>
Lesson 2	1 hour	<p>To investigate ways of using electrical motors to create rotating parts.</p>	<p>Show the children the components needed to make an electrical circuit with a motor using the pictures on the slides and real objects if available. How can we use this to make a fairground ride with a rotating part? What would we need to attach to the motor? What different kinds of rotating parts could we have? Children to think, pair, share their ideas.</p>	<p>Planbee slides Challenge Cards A/B Wires, motors, switches, etc. for electrical circuits</p>

			<ul style="list-style-type: none"> • Go through the information on the slides showing how pulley and belt systems can be used to transfer movement from one axle to another. • Tell children that today they will be investigating these different systems and then thinking about how they could be used in a design for a fairground rides. What rides do you think might use systems like this? Children to think, pair, share their ideas <p>Activity</p> <p>Provide children with wires, motors, switches, card, elastic bands, reels, and any other appropriate materials and ask them to create a circuit that would be suitable for making a variety of fairground rides using Challenge Card B to help.</p> <p>Questions for assessment</p> <p>Do children understand how pulley and belt systems can be used to transfer movement?</p> <ul style="list-style-type: none"> • Can children describe how an electrical circuit with a motor can be used to create rotating parts? • Can children manipulate their pulleys to create different movements? 	<p>Elastic bands, cotton reels, dowelling, card, etc. Challenge Card C (FSD? activity only)</p> <p>Laptops/tablet with coding software (FSD? activity only)</p> <p>Programming kits with motors (FSD? activity only)</p>
Lesson 3	1 hour	To create prototype models to investigate stable frameworks.	<p>Show children the pictures of various fairground rides on the slides and ask them to think about how they could create the frameworks for these rides using e.g. card, wood, dowelling, etc.</p> <ul style="list-style-type: none"> • Tell children that today they will be investigating different ways of making frameworks in preparation for designing and making their own fairground rides. These different experiments are prototypes for our final models. • Ask the children what sort of thing they think they will need to test and experiment with, e.g. materials, joining methods, moving parts, making stable structures. • Go through the slides showing different ways of strengthening materials and joins, e.g. using added triangles and diagonals. <p>Activity</p> <p>Children to work through the challenges on worksheet 3B, describing how they could use the ideas in their designs for their own fairground rides.</p>	<p>Planbee slides Worksheet 3A/3B/3C</p> <p>Card, dowelling, string, paper, straws, etc. Glue, scissors, rulers, etc. Ride Cards (FSD? activity only)</p> <p>Cameras/tablets to record (FSD? activity only)</p>

			<p>Children might need: card, paper, string, straws, dowelling, scissors, glue, tape and any other appropriate materials.</p> <p>Questions for assessment</p> <p>Can children describe ways of strengthening and reinforcing structures?</p> <ul style="list-style-type: none"> • Can children suggest ways in which ideas for frameworks could be developed to ideas for their own fairground ride designs? • Can children use a variety of materials and components accurately? 	
Lesson 4	1 hour	To be able to design a fairground ride with a rotating part.	<p>What ideas have you had so far about how you could design your own fairground ride? Encourage children to think about the work they have done on using circuits and motors, and on creating stable frameworks.</p> <ul style="list-style-type: none"> • Explain that over the next few lessons they will be designing, making and evaluating their own fairground rides. What kind of ride do you think you would like to make? Which part will rotate? How will you control the movement? How will you make your framework? Children to think, pair, share their ideas. <p>Activity</p> <p>Children to design their own fairground ride using worksheet 4B.</p> <p>Questions for assessment</p> <p>Can children make a decision about what kind of ride they will make?</p> <ul style="list-style-type: none"> • Can children design an appropriate electrical circuit for their ride? • Can children describe the process they will need to go through to successfully complete their product? 	<p>Planbee</p> <p>Slides Worksheet 4A/4B Optional: Photos of the children's prototypes from previous lesson Laptops (FSD? activity only)</p>
Lesson 5	1 hour	To be able to make a fairground ride following a design.	<p>Ask children to get out their designs from lesson 4 and give them a few minutes to look through them to remind themselves of what they need to do. Challenge children to describe the making process to a partner to ensure they have thought carefully about how they will go about making their fairground ride.</p> <ul style="list-style-type: none"> • Go through the questions on the slides: How will you make sure your finished product will look like your original design? How will you make 	<p>Planbee</p> <p>Slides Completed designs from lesson 4 Appropriate components for</p>

			<p>sure your framework structure is stable? What will you do if something goes wrong? How can you make sure you will work safely with the various tools, materials and electrical components?</p> <p>Activity Children to follow their designs to create their own fairground rides with rotating parts</p> <p>Questions for assessment Can children follow a design to create a fairground ride with a rotating part?</p> <ul style="list-style-type: none"> • Can children work accurately and safely with a variety of tools, materials and electrical components? • Can children identify ways of improving their fairground rides to create a finished product of a high quality? 	<p>electrical circuits Card, dowelling, straws, string, elastic bands, cotton reels, empty boxes, etc. Scissors, craft knives, glue, tape, etc.</p>
Lesson 6	1 hour	To be able to evaluate a finished product.	<p>Ask children to get out their completed fairground rides. Create a mini-fairground in the classroom by grouping all the completed rides together either on the floor or by grouping tables together.</p> <ul style="list-style-type: none"> • Give children some time to look at the other rides and examine how they work. Which designs do you like best? Why? • Go through the questions on the slides as a class: Why do you think it is so important to evaluate a finished product? What did you like best/worst about designing and making your fairground ride? What would you do differently if you were to make your fairground ride again? Children to discuss their ideas with a partner. <p>Activity Children to complete the evaluation on worksheet 6B.</p> <p>Questions for assessment Can children evaluate a finished product fairly?</p>	<p>Planbee Slides Completed fairground ride models Worksheet 6A/6B Worksheet 6C (FSD? activity only)</p>

			<ul style="list-style-type: none">• Can children suggest ways they could improve their product if they were to make it again?• Can children recognise ways in which they have been successful?	
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