

## Mechanisms / Mechanical systems

### Vocabulary

axle	axle holder
design	design criteria
Ferris wheel	Ferris wheel pod
frame	wheel

Specific **tools and resources** for each unit and individual lessons, are outlined and referred to on Kapow.

- ✓ *Presentation: Wheels and axles images* (optional – see Main event).
- ✓ *Presentation: Ferris wheel images.*
- ✓ Items with wheels, such as bicycles, toy cars and trolleys (optional – see Main event).
- ✓ Paper and pencils or whiteboards and pens (one each).
- ✓ Laptops or tablets with access to Microsoft Office for the extension activities (optional – one each, see Teacher guidance).
- ✓ Link: [Assessment – D&TY2: Fairground wheel](#) (optional – see Attention grabber).
- ✓ Link: [Bob the Builder - Spring City Wheel - Season 19, Episode 36](#) on VideoLink.\*
- ✓ Link: [Let's Get Rolling - Physics for kids](#) on VideoLink.\*
- ✓ Link: [Mr Thompson's Science video: Simple Machines: Wheel & Axle.](#)\*

### Vocabulary

design	design brief
design criteria	input
layers	lever
mechanism	model
motion	output
pivot	slider
spacers	structure
reinforce	research

Specific key **vocabulary** for each unit as well as individual lessons, are outlined and referred to on Kapow.

- ✓ A selection of pop-up/interactive books and greetings cards (enough for some on each table).
- ✓ A disassembled mechanism from a greetings card.
- ✓ A model pop-up book (made before the lesson – see Teacher knowledge).
- ✓ Colouring pencils (a selection on each table).
- ✓ Link: [Pop-Up Tutorial 16 - Automatic Pull-strips](#) on VideoLink.\*
- ✓ Link: [Best Pop-up Books by Robert Sabuda](#) on VideoLink.\*

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YEAR 2- Fairground Wheel		
Skills	Design	<ul style="list-style-type: none"> <li>• Selecting a suitable linkage system to produce the desired motion.</li> <li>• Designing a wheel.</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• Selecting materials according to their characteristics.</li> <li>• Following a design brief.</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• Evaluating different designs.</li> <li>• Testing and adapting a design.</li> </ul>
Knowledge	Technical	<ul style="list-style-type: none"> <li>• To know that different materials have different properties and are therefore suitable for different uses.</li> </ul>
	Additional	<ul style="list-style-type: none"> <li>• To know the features of a ferris wheel include the wheel, frame, pods, a base an axle and an axle holder.</li> <li>• To know that it is important to test my design as I go along so that I can solve any problems that may occur.</li> </ul>
<b>Vocabulary</b>	<b>See each lesson for key vocabulary to be taught</b>	

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YEAR 3- Pneumatic Toys		
Skills	Design	<ul style="list-style-type: none"> <li>• Designing a toy which uses a pneumatic system.</li> <li>• Developing design criteria from a design brief.</li> <li>• Generating ideas using thumbnail sketches and exploded diagrams.</li> <li>• Learning that different types of drawings are used in design to explain ideas clearly.</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• Creating a pneumatic system to create a desired motion.</li> <li>• Building secure housing for a pneumatic system.</li> <li>• Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy.</li> <li>• Selecting materials due to their functional and aesthetic characteristics.</li> <li>• Manipulating materials to create different effects by cutting, creasing, folding and weaving.</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• Using the views of others to improve designs.</li> <li>• Testing and modifying the outcome, suggesting improvements.</li> <li>• Understanding the purpose of exploded-diagrams through the eyes of a designer and their client.</li> </ul>
Knowledge	Technical	<ul style="list-style-type: none"> <li>• To understand how pneumatic systems work.</li> <li>• To understand that pneumatic systems can be used as part of a mechanism.</li> </ul>

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		<ul style="list-style-type: none"><li>• To know that pneumatic systems operate by drawing in, releasing and compressing air.</li></ul>
	Additional	<ul style="list-style-type: none"><li>• To understand how sketches, drawings and diagrams can be used to communicate design ideas.</li><li>• To know that exploded-diagrams are used to show how different parts of a product fit together.</li><li>• To know that thumbnail sketches are small drawings to get ideas down on paper quickly.</li></ul>
<b>Vocabulary</b>	<b>See each lesson for key vocabulary to be taught</b>	

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YEAR 5- Making a Pop-Up Book		
Skills	Design	<ul style="list-style-type: none"> <li>• Designing a pop-up book which uses a mixture of structures and mechanisms.</li> <li>• Naming each mechanism, input and output accurately.</li> <li>• Storyboarding ideas for a book.</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• Following a design brief to make a pop up book, neatly and with focus on accuracy.</li> <li>• Making mechanisms and/or structures using sliders, pivots and folds to produce movement.</li> <li>• Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.</li> </ul>
	Evaluate	
Knowledge	Technical	<ul style="list-style-type: none"> <li>• To know that mechanisms control movement.</li> <li>• To understand that mechanisms can be used to change one kind of motion into another.</li> <li>• To understand how to use sliders, pivots and folds to create paper-based mechanisms.</li> </ul>
	Additional	<ul style="list-style-type: none"> <li>• To know that a design brief is a description of what I am going to design and make.</li> <li>• To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.</li> </ul>
Vocabulary	See each lesson for key vocabulary to be taught	

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