



# Mechanisms

		<u>Reception</u> Christmas sliding Santa chimney	<u>Year 1</u> A moving book	<u>Year 2</u> Moonbuggies	<u>Year 3</u> Pneumatic toys	<u>Year 4</u>	<u>Year 5</u> Pop up books	<u>Year 6</u> Automata toys
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# Skills

## Design

### EYFS Outcomes

- Explore, use and refine a variety of artistic effects to express their ideas and feelings.
- Return to and build on their previous learning, refining ideas and developing their ability to represent them.
- ELG: Creating with  
Materials: Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.
- ELG: Creating with  
Materials: Share their creations, explaining the process they have used.
- ELG: Creating with  
materials: Make use of props and materials when role playing characters in narratives and stories.

- Explaining how to adapt mechanisms, using bridges or guides to control the movement.
- Designing a moving story book for a given audience.

Designing a vehicle that includes wheels, axles and axle holders, that when combined, will allow the wheels to move.

- Creating clearly labelled drawings that illustrate movement.

Designing a toy which uses a pneumatic system.

- Developing design criteria from a design brief.
- Generating ideas using thumbnail sketches and exploded diagrams.
- Learning that different types of drawings are used in design to explain ideas clearly.

Designing a pop-up book which uses a mixture of structures and mechanisms.

- Naming each mechanism, input and output accurately.
- Storyboarding ideas for a book.

- Experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement.
- Understanding how linkages change the direction of a force.
- Making things move at the same time.
- Understanding and drawing cross-sectional diagrams to show the inner-workings of my design.

# Make

Following a design to create moving models that use levers and sliders.

Adapting mechanisms, when:

- they do not work as they should.
- to fit their vehicle design.
- to improve how they work after testing their vehicle.

Creating a pneumatic system to create a desired motion.

- Building secure housing for a pneumatic system.
- Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy.
- Selecting materials due to their functional and aesthetic characteristics.
- Manipulating materials to create different effects by cutting, creasing, folding and weaving.

Following a design brief to make a pop up book, neatly and with focus on accuracy.

- Making mechanisms and/or structures using sliders, pivots and folds to produce movement.
- Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.

Measuring, marking and checking the accuracy of the jelutong and dowel pieces required.

- Measuring, marking and cutting components accurately using a ruler and scissors.
- Assembling components accurately to make a stable frame.
- Understanding that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles.
- Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set.

	<b>Evaluate</b>		<p>Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed.</p> <ul style="list-style-type: none"> <li>• Reviewing the success of a product by testing it with its intended audience.</li> </ul>	<p>Testing wheel and axle mechanisms, identifying what stops the wheels from turning, and recognising that a wheel needs an axle in order to move.</p>	<p>Using the views of others to improve designs.</p> <ul style="list-style-type: none"> <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>			<p>Evaluating the work of others and receiving feedback on own work.</p> <ul style="list-style-type: none"> <li>• Applying points of improvement to their toys.</li> <li>• Describing changes they would make/do if they were to do the project again.</li> </ul>
<b>Knowledge</b>	<b>Technical</b>		<p>To know that a mechanism is the parts of an object that move together.</p> <ul style="list-style-type: none"> <li>• To know that a slider mechanism moves an object from side to side.</li> <li>• To know that a slider mechanism has a slider, slots, guides and an object.</li> <li>• To know that bridges and guides are bits of card that purposefully restrict the movement of the slider.</li> </ul>	<p>To know that wheels need to be round to rotate and move.</p> <ul style="list-style-type: none"> <li>• To understand that for a wheel to move it must be attached to a rotating axle.</li> <li>• To know that an axle moves within an axle holder which is fixed to the vehicle or toy.</li> <li>• To know that the frame of a vehicle (chassis) needs to be balanced.</li> </ul>	<p>To understand how pneumatic systems work.</p> <ul style="list-style-type: none"> <li>• To understand that pneumatic systems can be used as part of a mechanism.</li> <li>• To know that pneumatic systems operate by drawing in, releasing and compressing air.</li> </ul>		<p>To know that mechanisms control movement.</p> <ul style="list-style-type: none"> <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>	<p>To understand that the mechanism in an automata uses a system of cams, axles and followers.</p> <ul style="list-style-type: none"> <li>• To understand that different shaped cams produce different outputs.</li> </ul>

# Additional

To know that in Design and technology we call a plan a 'design'.

To know some real-life items that use wheels such as wheelbarrows, hamster wheels and vehicles.

To understand how sketches, drawings and diagrams can be used to communicate design ideas.

- To know that exploded-diagrams are used to show how different parts of a product fit together.
- To know that thumbnail sketches are small drawings to get ideas down on paper quickly.

To know that a design brief is a description of what I am going to design and make.

- To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.

To know that an automata is a hand powered mechanical toy.

- To know that a cross-sectional diagram shows the inner workings of a product.
- To understand how to use a bench hook and saw safely.
- To know that a set square can be used to help mark 90° angles.