

ACET Junior Academies

Scheme of Work for Design Technology Y1 Mechanisms: Sliders and Levers



About this unit: In this unit, pupils will explore a range of books and products with moving parts and develop an understanding of how mechanisms are used to make parts move. They will learn how to make simple sliders and levers to make different kinds of movements. Pupils will use their learning to generate their own ideas for a moving product for an intended user and purpose. They will use knowledge and skills from previous learning to make and finish their moving products before evaluating them against the original design criteria. **Final piece ideas:** class story book, class information book, poster, display

Unit structure

1. Investigate and Evaluate - What moves?
2. Focused Tasks - How do you make sliders and levers? (could be covered over two lessons)
3. Designing - What could I make?
4. Making - Can I make the product I designed?
5. Making - Can I improve the appearance of my product?
6. Evaluating - How did I do?

Links to previous and future National Curriculum units

- EYFS - experience of working with card and paper, using simple cutting and joining skills.
- LKS2 - Mechanical Systems - Levers and Linkages
- UKS2 - Mechanical Systems - Pulleys and Gears

1: Investigate and Evaluate - What moves?

Links to previous learning	Knowledge and second order concepts	Skills, Concepts and Vocabulary:	Assessment criteria:	Curricular links:
<p>Children will have already had early experiences of working with paper and card to make simple hinges and flaps</p> <p>Children will have experience of cutting, shaping and joining skills using scissors, glue, paper fasteners and masking tape</p>	<p>Knowledge: Substantive knowledge: <i>(What students should know.)</i> Understand that products have been designed and produced. That there are a range of products with moving parts made for different users and for different purposes. That products have mechanisms that make them work.</p> <p>That products can be made from different materials.</p> <p>Second order concepts: <i>(What students should understand)</i> Evaluation User Purpose</p>	<ul style="list-style-type: none"> • Skills Explore products and talk about what it is and who it is for. • Explore what a product is for and how it is used. • Explore how a product works • Begin to identify and name some of the materials used to make the product • Talk about what they like or dislike about a product <p>Key vocabulary/concepts: https://20353.stem.org.uk/Nuffield%20Glossary2/index.html</p> <p>Evaluate, user, purpose, product, function, materials, lever pivot, slider, left, right, push, pull, up, down, forwards, backwards, in, out</p>	<p>Can your children: (Y1) Explore a range of products which use simple mechanisms. Understand what products are, who they are for and how they are used. Explain how sliders and levers work. (Y2) <i>Identify the materials used in the products.</i> <i>Say what they like or dislike about the products.</i></p>	<p>Horizontal: Maths - describe position, direction and movement. English - participate in discussion about books and other products, taking turns and listening to what others have to say. Ask relevant questions to extend their knowledge and understanding. Build technical and directional vocabulary. History - changes within living memory - toys and books</p> <p>Vertical:</p>
Suggested activities:		Resources:	Useful links:	
Pupils could explore range of books and everyday products that have moving parts, including those with sliders and levers. Encourage pupils to evaluate the product by asking questions - <i>What is it? What is it for? How is it used? Who is it for? How does it work? Where might you find it? What is it made from? What do you think about it?</i>		Books and everyday products with levers and sliders	https://www.youtube.com/watch?v=E8RA9Kw_IaE - maybe too difficult as lots of vocab on video. https://www.youtube.com/watch?v=lueqE0lxLyc	

<p>Use questions to develop the children's understanding of mechanisms and to introduce and develop technical and directional vocabulary. <i>What do you think will move? How will you make it move? What part of the product moved and how did it move? How do you think the mechanism works? What else could move in the product? How well does it work?</i> Pupils could apply their learning by completing an evaluation of a chosen product.</p>				
2: Focused Tasks - How do you make sliders and levers?				
Links to previous learning	Knowledge and second order concepts	Skills, Concepts and Vocabulary:	Assessment criteria:	Curricular links:
<p>Children will have explored a range of books and pictures with moving parts. They will be able to talk about the parts that move and describe the movement. They will have begun to explore mechanisms and how they make a part move.</p>	<p>(Could be taught over two lessons)</p> <p>Substantive knowledge: <i>(What students should know.)</i> How to use sliders and levers to make parts move. that different mechanisms produce different kinds of movement. Know and use technical vocabulary relevant to the project.</p> <p>Second order concepts: <i>(What students should understand)</i> Movement</p>	<ul style="list-style-type: none"> • Skills • Know about the simple working characteristics of materials and components • Know about the movement of simple mechanisms such as levers and sliders. • Begin to learn and use the technical vocabulary relevant for the projects they are working on. • Measure, mark out, cut, score and assemble materials and components with more accuracy. • With support, join, assemble and combine materials and components <p>Key vocabulary/concepts: Slider, lever, pivot, pull, push, up, down, straight, curve, forwards, backwards, in, out</p>	<p>Can your children: Explain how sliders and levers move? Choose appropriate tools and materials to create models of levers and sliders? Follow step-by-step instructions to make sliders and levers?</p>	<p>Horizontal: Describe position, direction and movement. Use appropriate standard and non-standard measures. Spoken language - Listen and respond appropriately to adults. Ask relevant questions to extend their knowledge and understanding. Build technical and directional language.</p> <p>Vertical:</p>

Suggested activities:		Resources:	Useful links:		
<p>(The focused tasks could be completed over two lessons) Examples of simple sliders and levers could be prepared in advance to demonstrate to the children how they work and the different kinds of movement that each gives, e.g. a slider to show a snail appearing from behind a rock, a lever showing a butterfly flying to a flower. Use questions to develop the children's understanding and encourage accurate use of technical vocabulary e.g. <i>How does the slider move? How does the lever move? Which part of the mechanism is the pivot? What does the movement of the lever and slider remind you of?</i> Making the sliders and levers could be modelled to the children, including the correct use of tools and equipment. This could be done in a step-by-step way and a flow chart or storyboard could be used to aid children. Pupils should choose and use tools and materials to replicate the slider and lever examples.</p>		Prepared examples of sliders and levers, variety of materials and tools for making slider and lever models	https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjno_-Z4vzAhWITsAKHXBODJUQFjAEegQIBRAB&url=http%3A%2F%2Fhillsgrove.net%2Fdownload%2Fi%2Fmark_dl%2Fu%2F4010976058%2F4632903859%2FY1%2520Sliders%2520and%2520levers.pdf&usq=AOvVaw1mVhTOGAwKlwAfAL-ElkkQ		

3: Designing - What could I make?

Links to previous learning	Knowledge and second order concepts	Skills, Concepts and Vocabulary:	Assessment criteria:	Curricular links:
Children should be able to talk about levers and sliders and how they work. They should be able to describe the different movements achieved from sliders and levers. They should be able to make appropriate choices of tools and materials in making model levers and sliders. They should have experienced making a model using levers and sliders.	<p>Substantive knowledge: <i>(What students should know.)</i> That products need to be designed before they are made. That designs should always meet the needs of the user and purpose. That design ideas can be communicated in different ways.</p> <p>Second order concepts: <i>(What students should understand)</i> Design User Purpose Criteria</p>	<p>Skills</p> <ul style="list-style-type: none"> • Talk about the product they will be designing and making • Explain who their product will be used by • Describe what their product will be used for • Begin to use simple design criteria to develop ideas <p>Key vocabulary/concepts: Slider, lever, pivot, design, intended user, design criteria</p>	<p>Can your children: talk about the products they could make. consider the purpose and intended user for the product? choose an appropriate mechanism? Help to generate design criteria? Communicate their ideas through discussion, mock-ups and design plans.</p>	<p>Horizontal: Spoken language - ask relevant questions to extend their knowledge and understanding. Build technical and directional vocabulary.</p> <p>Vertical:</p>

Suggested activities:	Resources:	Useful links:
<p>Discuss with the children what they will be designing, making and evaluating, e.g. a page from a story book, an information poster. Encourage them to develop ideas about their end product by asking questions, e.g. <i>Who is the product for? What is its purpose? What will move? How do you want it to move? Will you use a lever or slider?</i></p> <p>Generate simple design criteria with pupils e.g. the mechanism should work smoothly, it should make the right kind of movement.</p> <p>Children could develop ideas through talking, drawing and making mock-ups of their ideas with paper and card.</p> <p>Discuss the finishing techniques the children might use e.g. using digital text and graphics, paint, pen, pencils, collage etc.</p> <p>Discuss the order in which the mechanisms will be made - produce class plan in the form of a flow chart or story board that will support the children as they make the product.</p> <p>Pupils create a design plan for their intended product.</p>	<p>Materials and tools for making mock-ups</p> <p>Key vocabulary/concepts: Design, design criteria, user, purpose, mechanism, slider, lever,</p>	

4: Making - Can I make the product I designed?

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Links to previous learning	Knowledge and second order concepts	Skills, Concepts and Vocabulary:	Assessment criteria:	Curricular links:

<p>Children will have identified the product they are going to make. They will be able to talk about the purpose, intended user and the materials from which it will be built. Pupils will be aware of design criteria and will know the order in which they will make their product.</p>	<p>Substantive knowledge: (<i>What students should know.</i>) That their product needs to be made in a particular order. Know the materials, tools and equipment suitable for the task. Know the skills and techniques they are going to use to make their product.</p> <p>Second order concepts: (<i>What students should understand</i>) Evaluate Movement Problem solving</p>	<p>Skills</p> <ul style="list-style-type: none"> • Choose suitable tools for making • Choose suitable materials and components for their products based on suitability of their properties • Measure, mark out, cut, score and assemble materials and components with more accuracy. • With support, join, assemble and combine materials and components <p>Key vocabulary/concepts: Slider, lever, pivot, design criteria, evaluate, problem solve,</p>	<p>Can your children: Consider the order they will complete their task? Choose suitable materials and tools to complete their task? Evaluate their developing products and use problem solving skills when things go wrong?</p>	<p>Horizontal: Maths - use appropriate standard and non-standard measures. Art and Design - use colour, patterns, line, shape</p> <p>Vertical:</p>
<p>Suggested activities:</p>		<p>Resources:</p>	<p>Useful links:</p>	
<p>Give children the opportunity to revisit their design plans and recap the order in which the products will be made and the steps for making their mechanisms. Let children collect the materials and tools required for their product. Encourage the children to evaluate their developing products by referring to the design criteria e.g. <i>Does your lever move smoothly?</i> Encourage children to problem solve when things go wrong - <i>Why isn't it moving smoothly? What could you do to change that? Are you going to make any changes?</i></p>		<p>Range of card, masking tape, paper fasteners, glue stick, PVE glue, scissors</p>		
<p>5: Finishing - Can I improve the appearance of my product?</p>				
<p>Links to previous learning</p>	<p>Knowledge</p>	<p>Skills, Concepts and Vocabulary:</p>	<p>Assessment criteria:</p>	<p>Curricular links:</p>

<p>Children will have experienced using design plans to support the making of their product. They will have evaluated their evolving products and used problem solving skills when things go wrong.</p>	<p>Substantive knowledge: (<i>What students should know.</i>) That products need to be finished well to make them appealing to the user. Know a range of finishing techniques suitable for the product, including skills used in Art and Design.</p> <p>Second order concepts: (<i>What students should understand</i>) Evaluate Finish Appearance Appeal</p>	<p>Skills - Making:</p> <ul style="list-style-type: none"> • Begin to use simple finishing techniques including skills learnt in Art <p>Key vocabulary/concepts: Finish/finishing, appearance, appealing</p>	<p>Can your children: Use simple finishing techniques suitable for the product they are making? Evaluate their developing products and use problem solving skills when things go wrong?</p>	<p>Horizontal: Art and Design - use colour, pattern, line and shape</p> <p>Vertical:</p>
<p>Suggested activities:</p>		<p>Resources:</p>	<p>Useful links:</p>	
<p>Remind the children about the importance of finishing their product and of the finishing techniques they investigated. Encourage children to return to their plans. <i>How are you going to make your products appealing? What finishing techniques did you plan to use. Do you still plan to use the same techniques?</i> Children finish their products with their choice of technique.</p>		<p>Finishing resources, e.g. pens, pencils, paint, computing software, collage materials</p>		
<p>6: Evaluating – How did I do?</p>				
<p>Links to previous learning</p>	<p>Knowledge and second order concepts</p>	<p>Skills, Concepts and Vocabulary:</p>	<p>Assessment criteria:</p>	<p>Curricular links:</p>
<p>Children should have the experience of designing, planning, making and finishing a product. They should have experience of evaluating their work as they work and finding solutions to the problems they face.</p>	<p>Substantive knowledge: (<i>What students should know.</i>) That all new products are evaluated. That evaluations help products to develop. To evaluate their product by discussing how well it works in relation to the purpose and the intended user. To evaluate whether the product meets the design criteria.</p> <p>Second order concepts: (<i>What students should understand</i>) Evaluate</p>	<p>Skills</p> <ul style="list-style-type: none"> • Begin to talk about their design ideas and what they have made • Begin to make simple judgements of how the product met their design ideas and criteria. • Begin to identify ways in which their product could be improved. 	<p>Can your children: Talk about their product and how well it fits the intended purpose and user. Make simple judgements about how well their product meets the design criteria. Identify ways in which their product could be further improved.</p>	<p>Horizontal: Spoken language - ask relevant questions to extend their knowledge and understanding.</p> <p>Vertical:</p>

	Improve Develop	Key vocabulary/concepts: Evaluate, design criteria, user, purpose, function, product, ideas, appeal, finish, improve		
Suggested activities:		Resources:	Useful links:	
<p>Pupils engage in discussions about their own and other pupils' work. Develop evaluation through asking questions e.g. <i>Does the product suit the purpose? Does it suit the intended user? Does the mechanism work smoothly? Is it the right kind of movement? How well has the product been finished? Are the materials suitable for the product? How could the product be made more appealing?</i></p> <p>Pupils complete an evaluation for their own product.</p>		<p>Completed products Evaluation sheets</p>		