

# Mendell Primary School


Aspire Challenge Achieve

## Medium Term Plan Design Technology



<b>Year Group:</b> 1	<b>Term:</b> Spring 2 2022	<b>Teacher:</b> Nicole Morning	<b>Subject lead:</b> Catherine O'Neill Edwards	<b>Overview: Mechanisms – Sliders and levers</b> Design, make and evaluate an Easter card using a slider or lever	<b>Key End Points:</b> By the end of this unit children will <ul style="list-style-type: none"> <li>- Know what a mechanism is</li> <li>- Know what a slider is</li> <li>- Know what a lever is</li> <li>- Make a card with a slider or lever</li> </ul>	
<b>Links to other learning:</b> <ul style="list-style-type: none"> <li>• Art and design – use colour, pattern, line, shape.</li> <li>• Computing – digital graphics and text could be incorporated into final products as the background or moving parts.</li> <li>- Geography – town, country coast links in book.</li> </ul>	<b>Relevant Prior Learning:</b> <ul style="list-style-type: none"> <li>- Early experiences of working with paper and card to make simple flaps and hinges.</li> <li>- Experience of simple cutting, shaping and joining skills using scissors, glue, paper fasteners and masking tape.</li> </ul>	<b>Future Learning:</b> Y3: Mechanical Systems – Levers And Linkages	<b>High Quality Text:</b> <i>'Busy Railways'</i> a push, pull and slide book.	<b>Risk Assessment:</b> <ul style="list-style-type: none"> <li>- Scissors</li> <li>- <a href="https://www.youtube.com/watch?v=bsordXVQ Uq0">https://www.youtube.com/watch?v=bsordXVQ Uq0</a> video shows how to use blue tack to safely use split pins</li> </ul>		<b>Teacher CPD:</b> Please read the DATA project on a page sheets attached at the end of this plan prior to teaching. Slider – a rigid bar which moves backwards and forwards along a straight line. Unlike a lever, a slider does not have a pivot point. Lever - a rigid bar which moves around a pivot. Linkage (y3) - the card strips joining one or more levers to produce the type of movement required. - See teacher CPD power point from STEM and IET
<b>Learning Intention</b>	<b>Lesson Outline (Key Questions in colour)</b>			<b>Resources</b>	<b>Vocabulary</b>	<b>Lowest 20% Adaptations</b>
<p>I know what a mechanism is.</p> <p>I can investigate moving pictures and talk about how they work</p>	<p>This is a DT lesson. In DT we design and make to solve problems.</p> <p>Read the book <i>'Busy Railways'</i> a push, pull and slide book. Recap what was learned when they read 'A town mouse and a country mouse' Do they recall the differences between town and country? This book also shows coast. Briefly discuss geography. This is a DT lesson – <b>why might we have chosen this book to look at? How is this book different to other books?</b> Discuss moving pictures in 'Busy Railways'. How do we make them move? Introduce vocab: push, pull. (other books may also have turn movements). We are learning about moving pictures because we are going to be making special Easter Cards that have moving pictures. We need to learn more about <b>mechanisms</b> and how they work to make sure our cards are really good and work properly. <b>What is a mechanism? A mechanism is a group of parts that makes movement.</b> Repeat what is a mechanism in three different voice (e.g. squeaky, low, slow, fast). Repeat this question throughout the lesson to ensure children remember and revisit. In practice almost all products that contain moving parts – ranging from scissors to pop-up books to car engines – include some form of mechanism. Add <b>mechanism</b> to working wall.</p> <p>Investigative and Evaluative Activities (IEAs)</p> <ul style="list-style-type: none"> <li>• Children explore and evaluate a collection of books and everyday products that have moving parts – mechanisms, including those with levers and sliders focussing on how they make the pictures move and users of the book</li> </ul> <p>What is it? Who is it for? What is it for?</p>			<p>'Busy Railways' a push, pull and slide book.</p> <p>Range of books that have moving pictures</p> <p>DT books</p>	<p><b>Mechanism</b></p> <p>Push Pull Slider Lever Pivot</p>	

	<p>Do you think will move?  How will you make it move?  What is a mechanism?  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?</p> <ul style="list-style-type: none"> <li>• Introduce and develop directional vocabulary e.g. left, right, push, pull, up, down, forwards, backwards, in, out, turn, spin, round. Ask children to use words to describe how the user makes the pictures move.</li> </ul> <p>In books children complete the sentence stem <b>A mechanism is</b> _____</p> <p>Demonstrate on the board how to draw your favourite moving picture. Label with an arrow and keep details brief. Explain thinking aloud that you want your drawing to try and show how the picture moved. Label with word push and/or pull. Encourage children to respond to the IDEA activity in their books, they can choose to draw the moving pictures they saw or write about them. As they draw, encourage them to use arrows to show movement and label with push/pull.</p> <p>What is a mechanism?</p>			
<p>I can make a slider and say how it works</p> <p>I can make a lever and say how it works</p>	<p><b>This is a DT lesson. In DT we design and make to solve problems.</b></p> <p>Recap prior learning: <b>What is a mechanism?</b></p> <p>Introduce the vocabulary <b>Slider</b> and <b>Lever</b>. These are the two main types of mechanism we will be learning about and using when we make our cards.</p> <p>Slider – a bar that moves in a straight line.</p> <p>Lever - a bar that moves around a pivot (in an arc shape).</p> <p>Repeat these phrase throughout the session encouraging children to join in and try to remember the definitions, use my turn your turn and different voices to engages children</p> <p><i>Focused Tasks (FTs) In a focussed task the teacher will demonstrate how to make a simple slider and how to make a simple lever – the children then replicate this to ensure they have the skills needed to make a slider and/or lever. Teacher CPD power point from STEM and IET gives clear guidance – for cutting slots – fold paper in half and cut then unfold – ask COE if unclear.</i></p> <ul style="list-style-type: none"> <li>• Demonstrate simple levers and sliders to the children using prepared teaching aids. It may be helpful if these are also used in context e.g. the slider is used to show a snail appearing from behind a stone, the lever is used to show a butterfly flying to a flower.</li> <li>• Use questions to develop children’s understanding e.g. How does the slider move? How does the lever move? Which part of the mechanism is the pivot? What does the movement of the slider and lever remind you of?</li> <li>• Following teacher demonstration of the correct use of tools and materials, children should develop their knowledge and skills by replicating the slider and lever teaching aids. Encourage children to add pictures to their mechanisms. Adults help stick children’s focussed tasks in to book (adults need to do this to try and stick it in still allowing the mechanism to work – this could be started by additional adults whilst the teacher is demonstrating the next task). Teacher sticks their examples on the white board and labels parts (slider, pivot, lever, push, pull, top piece). Talk aloud as you do this demonstrating that you know how it works. Children then label their slider and lever in their books. Have key vocabulary on board/learning wall/desks for children to use</li> </ul> <p><b>What is a mechanism?</b>  <b>What is a slider? What is a lever?</b></p>	<p>Pre-cut levers and sliders  Card  Pritt sticks  Split pins (and blue tack to use safely)</p>	<p><b>Slider</b>  <b>Lever</b>  Movement  Pivot  Arc  Straight line</p>	

	<p>Once children have created a slider and a pivot encourage them to start thinking about Easter themed ideas that they could use for their top piece. They could record this via a simple mind map in their books – encourage children to share ideas with each other. Have lots of ideas to share with children on the theme of spring/Easter if they need inspiration.</p>  <p>What is a mechanism/? What is a slider? What is a lever?</p>			
<p>I can design an Easter card that uses a slider or lever</p>	<p>This is a DT lesson. In DT we design and make to solve problems. Recap prior learning: What is a mechanism? What is a slider? What is a lever? Today we are going to <b>design</b> our cards. What is a design? A design is a plan or drawing. Repeat this phrase throughout the lesson. 14. Design, Make and Evaluate Assignment (DMEA) • Discuss with the children what they will be designing, making and evaluating. When we make our <b>product</b> (card) we must be clear on the <b>user</b> and the <b>purpose</b>. Who will your product be for? This is the user. Children can make their card for someone at home. What will be its purpose? We want the card to say happy Easter – why would we do this? To make someone happy. How do you want it to move? Will you use a lever or a slider? Children need to be able to answer the above questions – these can be recorded in books if children are able however, as long as they are sure of the answers to the above questions, this does not necessarily need to be written down (product, user, purpose, slider or lever) • Let's make a list of things we need to make sure our <b>product</b> (the thing we are making) works properly. Generate simple design criteria with the children e.g. the mechanism should work smoothly, it should make the right type of movement, it must be Easter themed • Encourage the children to develop their ideas through talking, drawing and making mock-ups (practise models) of their ideas with paper and card. • Discuss the finishing techniques the children might use e.g. using digital text and graphics (finding and printing pictures off the computer), paint, felt tipped pens, pencils, collage. By the end of this lesson children should be clear on:</p> <ul style="list-style-type: none"> <li>• Product</li> <li>• User</li> <li>• Purpose</li> <li>• Mechanism (Slider or lever)</li> <li>• Top piece (their Easter image – the thing that moves)</li> <li>• Any finishing techniques (e.g. painting, pencils, pens, glitter)</li> </ul> <p>The most important thing is that children understand the above, as the class teacher, you decide how best to record this in books. The above could be noted at the end of the lesson on post it notes e.g. everyone get a pink post it note and write down your product and the user. On a green post it note write down if you are using a slider or lever, on the yellow post it note draw the image you want on your top piece etc. Children then draw what they want their product to look like. What is a mechanism? What is a slider? What is a lever? What is a design?</p>	<p>Variety of coloured post it notes Various Easter images</p>	<p><b>Design</b> Product User Purpose</p>	

<p>I can make an Easter card that has a slider/lever</p>	<p>This is a DT lesson. In DT we design and make to solve problems.  Recap prior learning: What is a mechanism? What is a slider? What is a lever? What is a design? Revisit post it notes (or other method of recording) from previous lesson and recap: product, user, purpose, mechanism, top piece, finishing techniques  Today children are going to make their products. Ask children to think quietly first about the order they will make their card in. Then ask them to share their order with a friends verbally rehearsing the order they will make it. Adults facilitate the conversations. Adults also create their own product   Children then make their cards. Adults support if needed and try to do this by asking questions rather than doing it for or telling the children. Photograph the finished products (close up to see mechanisms)</p>	<p>Variety of card  Sliders  Levers  Split pins  Computer and printer  Pens, pencils, glitter  etc  scissors</p>	<p><b>Product</b></p>	
<p>I can evaluate my product</p>	<p>This is a DT lesson. In DT we design and make to solve problems.  Recap prior learning: What is a mechanism? What is a slider? What is a lever? What is a design?  We have made our products and now we need to <b>evaluate</b> them. What is an evaluation? An evaluation is when we say what went well and what could be better.  Today we are going to look at our own products and say what went well, what was tricky and what could be better. Use the following questions to evaluate your own product in front of the children to demonstrate. Think aloud and critically  Does the product have a mechanism?  Does the mechanism work well?  Is the product Easter themed?  Does your product look like your design?  Did you change anything?  What was tricky to make?  What would make the product even better?  How much would you give your product /5?  Now I have evaluated my own product, can anyone else add anything? Does anyone have any extra feedback for me about my product? Add any additional feedback to your evaluation.  Give out evaluation sheets with the above questions to children and ask them to complete – adults assist with recording for children who struggle with writing as the quality of the evaluation is key rather than the ability to write it down.</p>	<p>Products  Evaluation sheets</p>	<p><b>Evaluation</b></p>	<p>Scribe for children who struggle with writing</p>

**1. Year Groups**  
**Years**  
**1/2**

**2. Aspect of D&T**  
**Mechanisms**

**Focus**  
**Sliders and Levers**

**4. What could children design, make and evaluate?**

class/group storybook poster display  
greetings card class/group information book  
storyboard other – specify

**5. Intended users**

themselves younger children parents  
grandparents friends visitor to school  
other – specify

**6. Purpose of products**

celebration event information pleasure  
interests hobbies educational  
other – specify

**16. Possible resources**

books and everyday  
products with levers and  
slider mechanisms

**17. Key vocabulary**

slider, lever, pivot, slot,  
bridge/guide

**7. Links to topics and themes**

Festivals and Celebrations Traditional Tales  
Nursery Rhymes history-based topic  
geography-based topic science-based topic  
other – specify

**8. Possible contexts**

imaginary story-based toys games  
people who help us home school  
garden playground local community  
environment other – specify

**9. Project title**

Design, make and evaluate a \_\_\_\_\_ (product)  
for \_\_\_\_\_ (user) for \_\_\_\_\_ (purpose).  
To be completed by the teacher. Use the project  
title to set the scene for children's learning prior  
to activities in 10, 12 and 14.

slider and lever teaching  
aids

card, masking tape,  
paper fastener, join

card strips, card  
rectangles, paper,  
masking tape, paper  
fasteners, paper binders,  
stick glue, PVA glue,  
finishing materials and  
media

pull, push, up, down,  
straight, curve, forwards,  
backwards

design, make, evaluate,  
user, purpose, ideas,  
design criteria, product,  
function

**3. Key learning in design and technology**

**Prior learning**

- Early experiences of working with paper and card to make simple flaps and hinges.
- Experience of simple cutting, shaping and joining skills using scissors, glue, paper fasteners and masking tape.

**Designing**

- Generate ideas based on simple design criteria and their own experiences, explaining what they could make.
- Develop, model and communicate their ideas through drawings and mock-ups with card and paper.

**Making**

- Plan by suggesting what to do next.
- Select and use tools, explaining their choices, to cut, shape and join paper and card.
- Use simple finishing techniques suitable for the product they are creating.

**Evaluating**

- Explore a range of existing books and everyday products that use simple sliders and levers.
- Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria.

**Technical knowledge and understanding**

- Explore and use sliders and levers.
- Understand that different mechanisms produce different types of movement.
- Know and use technical vocabulary relevant to the project.

**10. Investigative and Evaluative Activities (IEAs)**

- Children explore and evaluate a collection of books and everyday products that have moving parts, including those with levers and sliders. e.g. *What is it? Who is it for? What is it for?*
- Use questions to develop children's understanding e.g. *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?*
- Introduce and develop vocabulary e.g. lever, pivot, slider, left, right, push, pull, up, down, forwards, backwards, in, out.

**11. Related learning in other subjects**

- **Spoken language** – participate in discussion about books and other products with moving parts, taking turns and listening to what others say. Ask relevant questions to extend their knowledge and understanding. Build technical and directional vocabulary.

**12. Focused Tasks (FTs)**

- Demonstrate simple levers and sliders to the children using prepared teaching aids. It is helpful if these are also used in context e.g. the slider is used to show a snail appearing from behind a stone, the lever is used to show a butterfly flying to a flower.
- Use questions to develop children's understanding e.g. *How does the slider move? How does the lever move? Which part of the mechanism is the pivot? What does the movement of the slider and lever remind you of?*
- Following teacher demonstration of the correct use of tools and materials, children should develop their knowledge and skills by replicating the slider and lever teaching aids. Encourage children to add pictures to their mechanisms.

**13. Related learning in other subjects**

- **Spoken language** – children listen and respond appropriately to adults. Ask relevant questions to extend their knowledge and understanding. Build technical and directional vocabulary.
- **Mathematics** – describe position, direction and movement. Use appropriate standard and non-standard measures.

**14. Design, Make and Evaluate Assignment (DMEA)**

- Discuss with the children what they will be designing, making and evaluating e.g. *Who will your product be for? What will be its purpose? How do you want it to move? Will you use a lever or a slider?*
- Generate simple design criteria with the children e.g. the mechanism should work smoothly, it should make the right type of movement.
- Encourage the children to develop their ideas through talking, drawing and making mock-ups of their ideas with paper and card.
- Discuss the finishing techniques the children might use e.g. using digital text and graphics, paint, felt tipped pens or collage.
- As a whole class, talk about the order in which the mechanisms will be made.
- Ask children to evaluate their developing ideas and final products against the original design criteria.

**15. Related learning in other subjects**

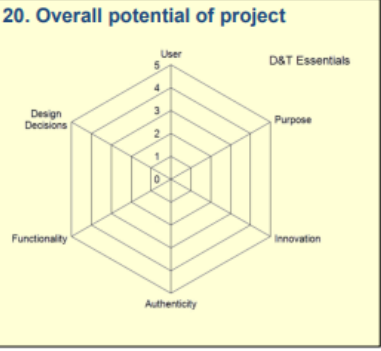
- **Spoken language** – ask relevant questions to extend their knowledge and understanding. Build technical and directional vocabulary. Use spoken language to develop understanding through imagining and exploring ideas.
- **Art and design** – use colour, pattern, line, shape.
- **Computing** – digital graphics and text could be incorporated into final products as the background or moving parts.

**18. Key competencies**

problem-solving teamwork negotiation  
consumer awareness organisation motivation  
persuasion leadership perseverance  
other – specify

**19. Health and safety**

Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.





Years 1/2

## Mechanisms Sliders and levers

### Instant CPD



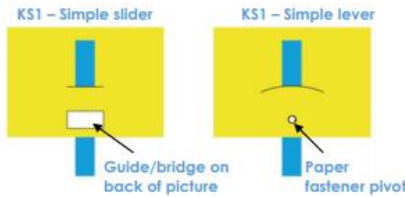
### Tips for teachers

- Using books and prepared examples of simple mechanisms, ask children to explain how the sliders and levers work.
- Prepare plenty of pre-cut strips of card for making the levers and sliders.
- To make a small hole for the pivot, a pencil can be used by placing the thin card over a piece of Plasticine or Blu Tack and pressing the pencil through.
- Guides/bridges can be made using strips of card fixed with masking tape.
- Display technical vocabulary and encourage the children to use it when discussing mechanisms and when designing and making.
- Make sure the existing books children investigate include moving pictures that are similar to the teaching aids.
- Mechanisms are operated directly by the children e.g. the slider is pushed and a snail appears from behind a stone.
- The mechanisms that children use are found in everyday products in the classroom or the school grounds. For example, levers are used to make door handles and sliders are used to make children's trays.
- Think about directional language e.g. sliders move in a straight line and levers move in a curve.
- Children may need extra support when they are attaching paper fasteners to levers.

### Useful resources at [www.data.org.uk](http://www.data.org.uk)

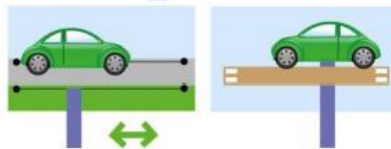
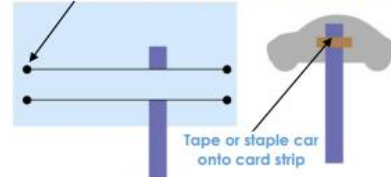
- [Moving Pictures](#)
- [Moving history book](#) (Yrs 3/4)
- [Working with sliders and levers](#)
- [Levers and linkages - Poster and Support Pack](#)
- [Mechanisms with a message](#) (Yrs 5/6)
- [D&T Primary Issue 17: Focus on Mechanisms](#)

### Teaching aids to demonstrate sliders and levers



### Sliders move from side to side and up and down

Use a single hole punch to make a hole then cut a slot



Sticky fixers on back of card  
A card strip could be used instead of cutting slots to allow movement

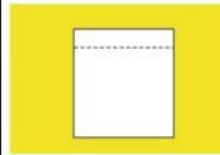


### Levers can be used with or without a slot

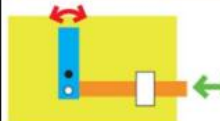


A card strip is used as a lever. The fish and boat are glued to the lever which is used as a handle.

As an enhancement to this project children could add flaps to their moving pictures. Some children may find flaps, which can be used to make a picture appear and disappear, easier to make than levers or sliders.



Where children have a particularly good understanding of levers and sliders in Key Stage 1, they could be introduced to the simplest lever and linkage mechanism used in Key Stage 2. This will introduce them to the idea of loose and fixed pivots.



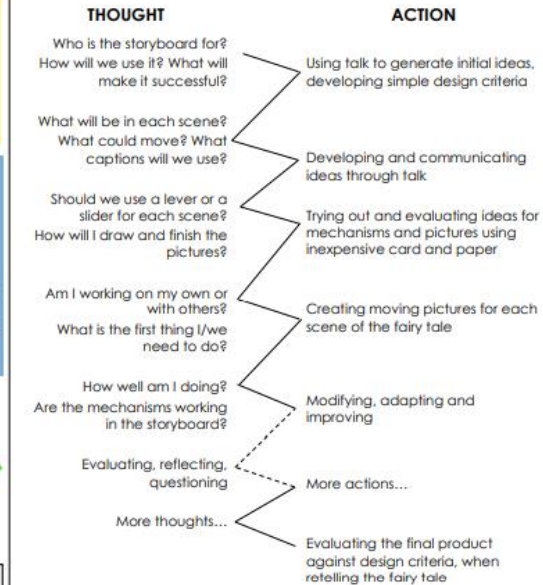
● Fixed pivot  
○ Loose pivot

### Simple mechanisms move...



### Designing, making and evaluating a moving storyboard to retell a fairy tale to the class

An iterative process is the relationship between a pupil's ideas and how they are communicated and clarified through activity. This is an example of how the iterative design and make process might be experienced by an individual pupil during this project:



### Glossary

- Mechanism** – a device used to create movement in a product.
- Lever** – a rigid bar which moves around a pivot. Levers are used in many everyday products. In this project children will use card strips for levers and paper fasteners for pivots.
- Slider** – a rigid bar which moves backwards and forwards along a straight line. Unlike a lever, a slider does not have a pivot point.
- Slot** – the hole through which a lever or slider is placed to enable part of a picture to move.
- Guide or bridge** – a short card strip used to keep sliders in place and control movement.