



Year 1

Medium Term Plan Subject: DT
Year Group: 1
Term: Spring
Topic: Mechanisms
Unit: Making a Moving Story Book

National Curriculum links:

- Explore and evaluate a range of existing products
- Explore and use mechanisms [for example, levers, sliders, wheels and axles]
- Design purposeful, functional appealing products for themselves and other users based on design criteria
- Generate, develop, model, and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology
- Select and use a range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing)
- Evaluate their ideas against design criteria
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New learning vocabulary:

Lesson: Learning Objective	Suggested Activities	Suggested Outcomes
Lesson 1 LO: To explore making mechanisms Success criteria: <ul style="list-style-type: none"> • I understand that levers and sliders are mechanisms • I know that levers and sliders can make things move • I can create moving models that use levers and sliders • I can use the words: up, down, left, right, vertical and 	<p style="text-align: center;"><u>Starter</u></p> <p>Put a teddy bear on a table. Ask the children how they could make the bear move up or down, side-to-side or round and round?</p> <p>Ask the children to stand up and demonstrate.</p> <p>Ask the children if we can make a picture move in the same way. How?</p> <p>Show the children your pre-assembled car and street and rabbit and hat that you have made up from the <i>Activity: Demonstrating levers and sliders</i>. See the <i>Teacher Video: Exploring levers and sliders</i>.</p> <ul style="list-style-type: none"> - Ask pupils how they think the car moves along the street scene? What might be behind the image that makes the car move? (A slider mechanism). - Ask the pupils how they think the rabbit moves up and down in the hat? What might be behind the image that makes the rabbit move? (A lever mechanism). 	<ul style="list-style-type: none"> • Did the children know what a lever or slot was before the lesson? • After the lesson, could the children describe how something moves using the language: up, down, left, right, vertical, horizontal? <p>Pupils with secure understanding indicated by: Identifying whether a mechanism is a lever or slider and determining what movement the mechanism will make.</p> <p>Pupils working at greater depth indicated by: Identifying if a mechanism is a lever or slider and being able to</p>



<p>horizontal to describe movement</p>	<p>If you would prefer not to make the demonstration models of the car and rabbit, you could simply show the children the <i>Pupil Video: Exploring levers and sliders</i>.</p> <p style="text-align: center;"><u>Main Activity</u></p> <p>Explore (20 minutes) Play the children the <i>Pupil Video: Exploring levers and sliders</i>. Explain to the children that they will be making each of the mechanisms that you demonstrated (the car and street scene (a slider) and the rabbit and hat (a lever)) so that they can start to explore how they work. You may want to have the <i>Pupil Video: Exploring levers and sliders</i> running in the background so the children can refer to it whilst you circulate.</p> <p>Using the <i>Activity: Exploring levers and sliders</i>, give each child a copy of a hat and rabbit (page 1), a street scene (page 2) and a car (page 3).</p> <p>Moving car</p> <ol style="list-style-type: none"> Make the slider: The children need to cut out the car image (unless you have done this already) and stick the car to a lollipop stick or strip of stiff card. This will be the 'slider'. Make the slot: The children take the street scene, fold the page in half lengthways and make a single hole in each corner of the folded edge. This will make four holes because the card is folded. Depending on the time available and the children's ability, you may want to have punched the holes in the street scene before the lesson. The children will now cut across the page between each set of two holes so that there are two parallel cuts running the length of the street. Refer the children to the <i>Pupil Video: Exploring levers and sliders</i> to remind them how to do this. These cut lines will form the two slots for the slider. Insert the slider in the slot: The children then insert their slider into the top slot and back out through the bottom slot. This mechanism is then a slider and will allow the children to slide the car backwards and forwards along the street or up and down. Children explore: Ask the children to move their sliders backwards and forwards and up and down and explain that the slider is moving through the slot. <p>Rabbit in a hat</p> <ol style="list-style-type: none"> Make the lever: The children need to cut out the rabbit image (unless you have done this already) and stick the rabbit to a lollipop stick or strip of stiff card. This will be the lever. Make the slot: The children need to cut out the hat and punch the four holes in it and cut the slots as show in the <i>Pupil Video: Exploring levers and sliders</i>. Insert the lever in the slot: The rabbit needs to move up and down. The children need to insert their lever rabbit through the two slots so that it appears to move up and down in the hat. 	<p>determine what movement the mechanism will make. An ability to explain how they might adapt the mechanism, using bridges or guides to control the movement.</p>
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	<p>4. Children explore: Ask the children to move their levers up and down and explain that the lever is moving up and down through the slot.</p> <p>5. Make a bridge or guide: Explain that a lever sometimes has a bridge or guide to stop the lever from moving side to side. To make the guides, use pieces of cardboard and stick them either side of the lollipop stick to stop any movement left or right, so the lever only moves up and down. Refer the children to the <i>Pupil Video: Exploring levers and sliders</i> for reminders on how to make the guides.</p> <p style="text-align: center;"><u>Plenary</u></p> <p>Go through the <i>Presentation: Exploring levers and sliders</i>, which shows several pictures and descriptions of movements.</p> <p>Ask the children to consider the direction of movement in each of the examples and then state what mechanisms would be needed to make this movement required – either a slider or a lever.</p>	
<p>Lesson 2</p> <p>LO: To design a moving story book</p> <p>Success criteria:</p> <ul style="list-style-type: none"> I can design three pages of my moving story book by: <ul style="list-style-type: none"> - drawing background pictures - drawing the moving parts - deciding whether I will use a lever or a slider on each page - labelling the movement of each lever/slider 	<p style="text-align: center;"><u>Starter</u></p> <p>Tell children the story of Humpty Dumpty or watch the video on Safe YouTube. Alternatively, you may choose to adapt this unit to a story that you have been reading in English.</p> <p>Ask children to recap the three main events in the story:</p> <ul style="list-style-type: none"> - Humpty Dumpty sitting on a wall - Humpty Dumpty falling off the wall - The King's men trying to put Humpty Dumpty together again <p>Explain to the children that they will be making moving picture boards, similar to the one they saw last week (the car on the street and the rabbit in the hat) to present to an audience (a reception class).</p> <p>The children need to make sure that their moving pictures tell the story without using words. Give children time to talk with their partner about how they could do this.</p> <p>Ask pupils what we know about the target market (reception aged children). Get the children to think about what reception aged children like and dislike about books (Do they want colourful pictures, funny pictures, big or small pictures?)</p> <p>Ask the children to share their thoughts with the class.</p>	<p>Did the children:</p> <ul style="list-style-type: none"> Use technical language during the lesson? Consider how they wanted different parts to move? <p>Pupils with secure understanding indicated by: Clearly labelling drawings to show which parts of their design will move and in which direction.</p> <p>Pupils working at greater depth indicated by: Clearly labelling the moving parts and mechanism of a design that has multiple parts, moving in different ways on each page.</p>



When you have gathered enough of their ideas, based on what they have said, scribe a 'Design Criteria' on the board (for example, bright colours, cartoon pictures, varied movements, large and sturdy levers/sliders (so that the moving parts don't break easily). Tailor the number and the complexity of points in your Design Criteria to your class.

*Keep/save the Design Criteria to refer to in Lessons 3 and 4.

Main Activity

Discuss (10 minutes)

Discuss with the children the three different parts of the story in turn with regards to the following:

- How would you tell that part of the story through a picture?
- What movement might there be in that part of the story?
- Where might that part of the story be set/what would the background look like?

Explain that before we start making anything, we will need to plan what we will do. In Literacy, we use story mountains, mind maps and paragraph plans but in Design technology we have a different word for a plan: a 'design'.

How will we put our design on paper?

What details might we want to record?

Generate a list of things the design should have, a success criteria of sorts, which might include:

- mechanism type
- direction of movement
- moving part image, for example, Humpty Dumpty or the King's men

Design (20 minutes)

Model on the board, what each of the three pages of a Humpty Dumpty moving picture might include by displaying one of the slides of from the *Presentation: Design template*.

There are four slides in total and each is completed to a different degree.

- Slide one is a plan of blank pages for more able children.
- Slides two and three are partially completed with either backgrounds or moving parts.
- Slide four is an example of an almost complete plan.



	<p>Depending on the ability of your class, choose one of the slides to model the activity. Draw out children's understanding of the task by asking pupils for their direction/input with regards to background, moving parts and mechanisms.</p> <p>Save this model for the next lesson. You may also want to display it for any children to 'magpie' ideas, if they get stuck when designing their own versions.</p> <p>Now give each child a print of the slide you think is most appropriate for them to complete, either on their own, as a pair or in a group, and whether working with or without a Teaching Assistant.</p> <p>*The examples of backgrounds and moving parts in the slides can be printed for children to use when they come to making their books using the <i>Storybook page template</i> and <i>Storybook moving parts template</i>, found in Lesson 3. Giving these resources to pupils now will allow them to concentrate on making the levers and sliders and the assembly of their project.</p> <p style="text-align: center;"><u>Plenary</u></p> <p>Number children one and two, and ask all 'ones' to find a 'two' and explain their plan. Then repeat, finding a different partner. Now do the same for twos so that they can share their ideas; again, repeat.</p> <p>Children may now want to adapt or amend their plans based on what they have seen or heard from others. Allow them a few minutes to amend their ideas as/if necessary.</p>	
<p>Lesson 3</p> <p>LO: To construct a moving picture</p> <p>Success criteria:</p> <ul style="list-style-type: none"> I can make my moving picture by: <ul style="list-style-type: none"> Drawing my background Drawing and cutting my moving parts 	<p style="text-align: center;"><u>Starter</u></p> <p>Show children the class design criteria from the 'Attention Grabber' of last week's lesson. Go over the points, reminding children of what they are going to make and for whom it will be made.</p> <p>Now display on the interactive whiteboard (IWB) the design template from the <i>Presentation: Design template</i> that you modelled last lesson, with the help of the children, to remind them of the project and what they are going to make.</p> <p>Ask children if they can remember how they made slots in the first lesson (using a hole punch). You may want to direct children to use a ruler to draw a line between the holes to cut along.</p> <p style="text-align: center;">Remind children that all levers and sliders should be made from either a lollipop stick or stiff card.</p>	<p>Did the children:</p> <ul style="list-style-type: none"> Use technical language during the lesson? Cut parts and slots with accuracy? Test their movements before final assembly? <p>Pupils with secure understanding indicated by: Having made a picture, which meets the design criteria, with parts that move purposefully as planned.</p>



<ul style="list-style-type: none"> - Making levers and sliders for my moving parts - Putting all my parts together to create my moving picture - Possibly making guides and bridges 	<p style="text-align: center;"><u>Main Activity</u></p> <p>Plan (10 minutes) Continuing to display your design template and ask the children which parts of the design we might want to make first. Remind the children that we also need to make the levers and sliders.</p> <p>You could start with the moving parts, but children might make their drawings very small. If you start with the background, then children will have a better concept of proportions and how big/small they should make them.</p> <p>Model making the design described in your design template displayed on the IWB.</p> <ol style="list-style-type: none"> 1. Model making the background - you will need to demonstrate cutting out the slots needed 2. Draw and cut out the moving parts - explain that the moving parts need to be in proportion to the background 3. Make the handles and glue to the moving parts 4. Assemble the parts into the pages <p>Recap these steps with the children and recap by showing them the <i>Pupil Video: Construction</i>. You may want to leave this to run while the children are making their moving pictures so that they have something to keep referring to while you circulate.</p> <p>Make (20 minutes) Children can now start making their moving pictures (this will take a while!)</p> <p>Give them lots of time and materials to follow the steps you demonstrated, creating their own detailed backgrounds for each page first.</p> <p>Another option is to tell them to draw just one background for page one which, if photocopied, can be used for pages two and three as well.</p> <p>*You may have given some children the differentiated slides from <i>Presentation: Design template</i> in Lesson 2. If this is the case, you can print these backgrounds and any/all of the moving parts using the <i>Activity: Storybook page template</i> and <i>Activity: Storybook moving parts template</i>:</p> <ul style="list-style-type: none"> - The <i>Activity: Storybook page template</i> provides a background that can be coloured in and then photocopied for each of the three pages the children will be making. 	<p>Pupils working at greater depth indicated by: Having made a finished product with multiple parts that move purposefully as planned. Where parts do not move as planned they are able to explain why and how they would be fixed.</p>
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	<ul style="list-style-type: none"> - The <i>Activity: Storybook moving parts</i> provides three pictures of Humpty Dumpty to be used on each page and two soldiers. <p>Giving these resources to pupils will allow them to concentrate on making the levers and sliders and the assembly of their project.</p> <p>If you photocopy children's backgrounds or use the <i>Storybook Page Template</i> these should be glued onto card to make them stronger.</p> <p>*When assembling the project, some children may want to make bridges or guides to ensure the movement is controlled.</p> <p>Bridges and guides are simply thin bits of card that restrict the movement of the lever – stop it from wobbling, for instance. This stage might be one you reserve for your more able pupils or those whose design needs levers to make it work.</p> <p style="text-align: center;"><u>Plenary</u></p> <p>Ask children to sit quietly for a moment looking at their finished products. Ask them to think about these questions:</p> <ul style="list-style-type: none"> - What bit do you like best and why? - What was easy to make and why? - What was hard to make and why? - If you did it again, would you do anything differently? - Did you find cardboard easy to work with or would you have liked to have used a different material? - If something isn't working as well as it should, do you know why? <p>You may want them to record this on speech bubbles, sugar paper or as a class on the board.</p>	
<p>Lesson 4</p> <p>LO: To evaluate my finished product</p> <p>Success criteria:</p> <ul style="list-style-type: none"> • I can review the success of my product by testing it 	<p style="text-align: center;"><u>Starter</u></p> <p>Search the internet for flawed designs and share these with the children on the interactive whiteboard (IWB). Alternatively suggest the following and get the children to explain what would be wrong with such a design:</p> <ul style="list-style-type: none"> - a bike with square wheels - a chocolate teapot - a bucket full of holes - a bed of nails - cardboard trainers 	<p>Pupils with secure understanding indicated by: Evaluating the main strengths and weaknesses of their design and suggesting alterations.</p> <p>Pupils working at greater depth indicated by: Evaluating the main strengths and weaknesses of their design and suggesting meaningful</p>



(reading it to Reception children)

- I can evaluate my product against the Design Criteria
- I can consider what I have learnt from making my moving story book

Ask children to think about changes that they would make to the designs to make them better.

What other things in their homes would they adapt to make even better? Share their ideas with the class.

Main Activity

Review (15 minutes)

Explain that designers often make many prototypes (drafts) before they get everything right. Tell the children that making small adjustments to a design is an important part of the design process as it makes the end product better and easier to make.

To help us do that with the moving storybook designs, the children are going to show the designs to some children in a reception class, and see what they think. When the children do this, they must remember to find out what the reception children liked, didn't like and what they found hard to use. This is so that the children would know what adaptations and improvements they would need to make if they were to make their designs again.

Evaluate (15 minutes)

Recall the questions you asked children at the end of the last session and their responses, this will help them get back into that critical frame of mind.

Display the design criteria that you made together in Lesson 2 and go through the points, asking children to think about these in relation to their finished products.

Now give each child the *Activity: Evaluation* that you have already completed with the class design criteria. The children should indicate with the most appropriate face how they feel their moving story book meets each point. A completed table might look like this:

Design Criteria	😊 😐 😞
It is brightly coloured	😊

alterations that will address these weaknesses.



It has sliders	😊
It has levers	😊
The levers and/or sliders are strong	😐

If you're really ambitious you could have children walking around the room peer assessing finished products.

Now ask pupils to record on the *Activity: Evaluation* what they might change about their design (you may have to prompt for changes in colour, material, shape, movement, or composition).

Plenary

Discuss what the reception children thought of the designs. Did they like them: What sort of things did they like? What didn't they like? Did they struggle to use any parts? How might we change those parts?

This is a great point to assess what children have taken from this unit.

Display the questions below one at a time, giving children an opportunity between each to answer them.

- One thing that I found hard was...
- One thing that I found easy was...
- The thing I am most proud of doing is...
- One thing that I have learnt that I didn't know before is...
- One thing I must try to remember is...