



Design Technology- MTP Mechanism Unit- Summer Term

Learning Ladders Covered:

Y1-MS-E2 I can review the success of a product by testing it with its intended audience

Y1-MS-E1 I can test a finished product, seeing whether it moves as planned and if not, explain why and how it can be fixed

Y1-MS-M1 I can follow a design to create moving models that use levers and sliders

Y1-MS-D1 I can design a moving story book for a given audience.

1	LI: I can explore how to make mechanisms. Lesson Delivery: Put a teddy bear on a table. Ask the children how they could make the bear move up or down or from side-to-side. Ask the children to stand up and demonstrate. Ask the children if a picture can move in the same way. How? Show the children your pre-assembled car and street, and rabbit and hat that you have made using the Activity: Demonstrating sliders. Ask the children how they think the car moves along the street scene. What might be behind the image that makes the car move? (A side-to-side slider mechanism). Ask the children how they think the rabbit moves up and down in the hat? What might be behind the image that makes the rabbit move? (An up-and-down slider mechanism). Explain that mechanisms are the parts of an object that move together. Explore Explain that the children will be making each of the mechanisms that you demonstrated (the car and street scene (a side to-side slider) and the rabbit and hat (an up-and-down slider) so that they can start to explore how they work. Using the Activity: Exploring sliders, give each child a copy of a hat and rabbit (page 1), a street scene (page 2) and a car (page 3). Moving car 1. 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. The lollipop stick or stiff card will act as a handle. The car on the handle will be the slider.	Resources Have ready A teddy bear (or another toy). Lollipop sticks or strips of stiff card, 2 cm width (two sticks per child). Strips of card 2cm x 10 cm for bridges (one per child). Scissors, non-toxic PVA glue with pots and glue spreaders, rubbers, rulers and a hole-punch. The car and street, and rabbit and hat assembled from the Activity: Demonstrating sliders (to use as demonstration models). Objects that move, e.g. a ball (see Wrapping up, to use as demonstration models). Access to an outdoor area, e.g. a playground (see Wrapping up, to use as demonstration models, e.g. water tray with boats in to see them moving, a seesaw, etc). Print in advance Activity: Demonstrating sliders	Key Vocabulary Sliders Mechanism
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	2. Make the slot: The children take the street scene, fold the page in half lengthways along the line marked, 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 now cut across the page between each set of two holes so that there are two parallel cuts running the length of the street. These cut lines will form the two slots for the slider. 3. Insert the slider in the slot: The children then insert their car slider into the top slot and back out through the bottom slot. This mechanism allows the children to slide the car backwards and forwards along the street. 4. Children explore: Ask the children to move their sliders backwards and forwards and explain that the slider is moving through the slot. Rabbit in a hat 1. Make the slider: 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. The lollipop stick or stiff card will act as a handle. The rabbit on the handle will be the slider. 2. Make the slot: The children need to cut out the hat and punch two holes in it. This can be done using a pencil with a rubber behind the card so that the pencil pierces the hat and goes safely into the rubber behind. The children then cut between the two holes to make the slot. 3. Insert the slider in the slot: The rabbit needs to move up and down. The children need to insert their slider rabbit through the slot in the front of the hat so that the handle is behind the hat. They can then make the rabbit move up and down through the slot as if it is moving in and out of the hat. 4. Children explore: Ask the children to move their sliders up and down and explain that the slider is moving up and down through the slot. Extension: Ask the children how they might stop the rabbit from wobbling from side-to-side instead of going straight up and down. This is done by using guides, which are pieces of card stuck to the back of the hat on either side of where the handle will run. They form a sort of groove in which the handle slides, so restricting the movement. Questions What do you think will move? How will you make it move? Which part of the mechanism will move? In what way will it move?	(one copy of pages one and two per child and one copy of page three for every four children).	
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2	LI: I can design a moving storybook. Lesson Delivery: Tell the children the story of Humpty Dumpty or watch the video, Humpty Dumpty sat on a wall on VideoLink. Ask children to recap the three main events in the story: Humpty Dumpty sitting on a wall. Humpty Dumpty falling off the wall. The King's men trying to put Humpty Dumpty together again. Explain that the children will be making moving picture boards similar to the ones they saw in Lesson 1 (see Design & Technology, Movement and sliders, Lesson 1: Exploring sliders and movement – the car on the street and the rabbit in the hat), and will present these to an audience (a reception class). The children need to make sure that their moving pictures tell the story without using words. Give the children time to discuss how they could do this with a partner. Ask the children 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?) Ask the children to share their thoughts with the class. When you have gathered enough of the children's ideas, write a 'design criteria' on the board based on what they have said (for example, bright colours, cartoon pictures, varied movements, large and sturdy sliders so that the moving parts don't break easily). Tailor the number and the complexity of points in the design criteria to the class. Make sure the design criteria is saved, as this will be needed to refer to in this unit's third and fourth lessons. Discuss Discuss the following points with the children in relation to the three different parts of the story: How will you tell the 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 we need to plan what we will do before making anything. In Literacy, we use story mountains, mind maps and paragraph plans but in Design and Technology, we have a different word for a plan: a 'design'. Discuss: How will we put our design on paper? What details might we want to record on our design?	Resources Have ready Presentation: Brain dump. Presentation: Design template – Moving storybook. Link: Humpty Dumpty sat on a wall on VideoLink – this is an external website and we do not have control over their content – please check before showing this to the children. Print in advance Activity: Design template (the most appropriate template should be given to each child, printed onto A3). Activity: Storybook page template (one per child). Activity: Storybook moving parts template (one per child).	Key Vocabulary adapt design design criteria input mechanism model sliders template
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	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 Show the Presentation: Design template – Moving story book on the interactive whiteboard. Presentation: Design template – Moving story book1 The presentation is replicated in the Activity: Design template, which the children will use. Using the Presentation: Design template – Moving storybook, model on the board what each of the three pages of a Humpty Dumpty moving picture might include by displaying one of the slides. Each slide offers an adaptive approach to the task by expanding or limiting the number of blocks the children complete. Slide 2 is a plan of blank pages for more able children. Slides 2 and 3 are partially completed with either backgrounds or moving parts. Slide 4 is an example of an almost complete plan. Depending on the class's ability, choose one of the slides to model the activity. Ask the children for their input on background, moving parts and mechanisms to check the children's understanding. Save this model design template for Lesson 3 (see Design & Technology, Mechanisms: Making a moving storybook, Lesson 3: Construction). You may also want to display it for children to 'magpie' ideas if they get stuck designing their own versions. Give each child a copy of the most appropriate page or pages from the Activity: Design template for them to complete. The children can work independently, in pairs or in a group; some need to work with a Teaching Assistant. The Activity: Storybook page template and Activity: Storybook moving parts template could also be used and handed out. These give examples of backgrounds and moving parts that the children can use in Lesson 3 when they come to make their books. Giving these resources to the children now will allow them to concentrate on making the sliders and assembling their projects. What is it that we are making? Who is it for, or who will use it? What will it do? Why will people want to have it?		
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3	LI: I can construct a moving picture. Lesson Delivery: Show the children the class design criteria created in Lesson 2: Design (see the Attention grabber). Go over the points, reminding the children of what they are going to make and for whom it will be made. Display the design template created and modelled with the help of the children in Lesson 2: Design to remind the class of the project and what they are going to make. Ask the children if they remember how they made slots in Lesson 1 (see Design & Technology, Year 1, Making a moving storybook, Lesson 1: Exploring movement and sliders) (using a hole punch). The children may need to be directed to use a ruler to draw a line between the holes to cut along. Remind the children that all sliders should be made from either a lollipop stick or stiff card. Plan (10 minutes) Continue to display the design template and ask the children which parts of the design they might want to make first. Remind the children that they also need to make the sliders. It could be that the moving parts are started first, but children might make their drawings very small. If the background is started first, then the children will have a better concept of proportions and how big/small they should make the moving parts. Model making the design described in the design template: 1. Model making the background – 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 them to the moving parts 4. Assemble the parts into the pages Recap these steps with the children by showing them the Pupil video: Construction (see Watch) and displaying this on the interactive whiteboard. This may be left to run while the children make their moving pictures so they have something to keep referring to. Make (20 minutes)	Resources Have ready Presentation: Agree or disagree. Completed class design criteria, created in the Attention grabber in Lesson 2: Design. The class design template modelled in Lesson 2 (see Design & Technology, Year 1, Making a moving storybook, Lesson 2: Design). Each child's design templates from Lesson 2 (see Design & Technology, Year 1, Making a moving storybook, Lesson 2: Design). Card or thick paper for the background and to draw moving parts (four sheets of A4 per pupil). Lollipop sticks or strips of stiff card – 2cm width (two per pupil). Scissors. Print in advance Activity: Design template (one per child). Activity: Storybook moving parts template (optional, one per child). Activity: Storybook page template (optional, one per child).	Key Vocabulary assemble design design criteria input mechanism model sliders template
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	The children start making their moving pictures. Give the children lots of time and materials to follow the steps demonstrated and shown in the Pupil video: Construction (see Watch). They start by creating their own detailed backgrounds for each page first. Alternatively, they could draw just one background for page one, which, if photocopied, can also be used for pages two and three. Some children may have been given the differentiated slides from Activity: Design template in Lesson 2 (see Design & Technology, Year 1, Making a moving storyboard, Lesson 2: Design). If so, these backgrounds and any/all of the moving parts could be printed using the following: 1. Activity: Storybook page template, which provides a background that can be coloured in and then photocopied for each of the three pages the children will be making. 2. Activity: Storybook moving parts, which provide three pictures of Humpty Dumpty to be used on each page and two soldiers. Giving these resources to the children will allow them to concentrate on making the sliders and the assembly of their project. If the children's backgrounds are printed, or the Activity: Storybook page template is used, these should be glued onto card to make them stronger. When assembling the project, some children may want to make bridges or guides to ensure the movement is controlled. Bridges and guides are thin bits of card that restrict the movement of the slider – stopping it from wobbling, for instance. This stage might be reserved for the more able pupils or those whose design needs up and down sliders to make it work.		
4	LI: I can evaluate my finished product. Lesson Delivery: Search the internet for flawed designs and share these with the children on the interactive whiteboard. Alternatively, suggest the following and get the children to explain what would be wrong with such a design: - A bike with square wheels. - A chocolate teapot. - A bucket full of holes. - A bed of nails. - Cardboard trainers.	Resources Have ready Presentation: 3, 2, 1. A reception class to test the moving picture designs. Completed class design criteria, created in the Attention grabber in Design and Technology, Mechanisms, Making a	Key Vocabulary assemble design design criteria sliders template test

	Ask the children to think about changes they would make to the designs to improve them. What other things in their homes could the children adapt to make them even better? Get the children to share their ideas with the class. Review 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 the children test the moving storybook designs and decide on what adjustments need to be made, they will show their designs to some children in a reception class and see what they think. Explain to the children that when they show their designs to the reception children, they must remember what the reception children liked, did not like and what they found hard to use. This is so the children know what adaptations and improvements they would need to make if they were to make their designs again. Evaluate Recall the questions that were asked to the children at the end of Design and Technology, Mechanisms: Making a moving storybook, Lesson 3: Construction and their responses; this will help them get back into a critical frame of mind. These questions were: What bit of the finished product did they like best and why? Was the product easy to make and why? Was the product hard to make and why? If they were to make the product again, would they do anything differently? Was cardboard easy to work with or would they have liked to use a different material? If something is not working as well as it should, do they know why? Display the design criteria made together in Design and Technology, Mechanisms: Making a moving storybook, Lesson 2: Design and go through the points, asking the children to think about these in relation to their finished products. Give each child one of the differentiated versions of the Activity: Evaluation as best suits them and get them to complete the evaluation for their own product. Ask the children to explain or record on the Activity: Evaluation of what they might change about their design (the children may have to prompt for changes in colour, material, shape, movement, or composition).	moving storybook, Lesson 2: Design. Print in advance Activity: Evaluation (one of the differentiated versions per child).	
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	There are three differentiated versions of the Activity: Evaluation. Version 1: Word bank- pupils select and circle the most appropriate words to finish the sentence. Version 2: Sentence-finisher- where the pupils need to complete each sentence. Version 3: Populated with the class design criteria from Lesson 2, the pupils evaluate using emojis. If you are ambitious, you could get the children to walk around the room, peer assessing each other's finished products.		
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