1. Year Groups

Years 1/2

2. Aspect of D&T

Mechanisms

Focus

Sliders and Levers

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.

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

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.

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.

16. Possible resources

books and everyday products with levers and slider mechanisms

slider and lever teaching aids

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

left/right handed scissors, cutting mats, card drills

17. Key vocabulary

slider, lever, pivot, slot, bridge/guide

card, masking tape, paper fastener, join

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

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

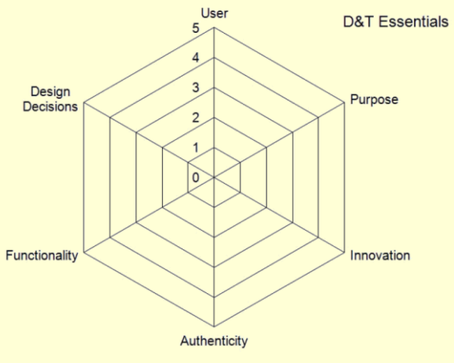
18. Key competencies

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.

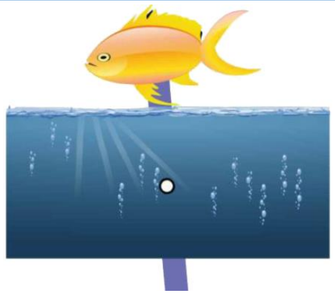
20. Overall potential of project



Years 1/2

Mechanisms
Sliders and levers

Instant CPD



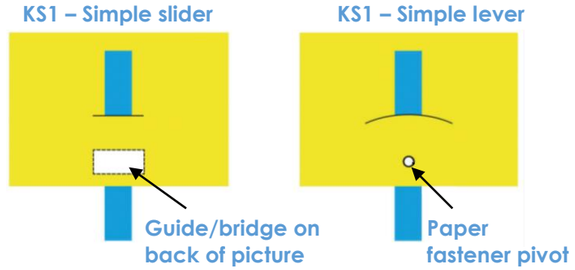
Tips for teachers

- ✓ 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.

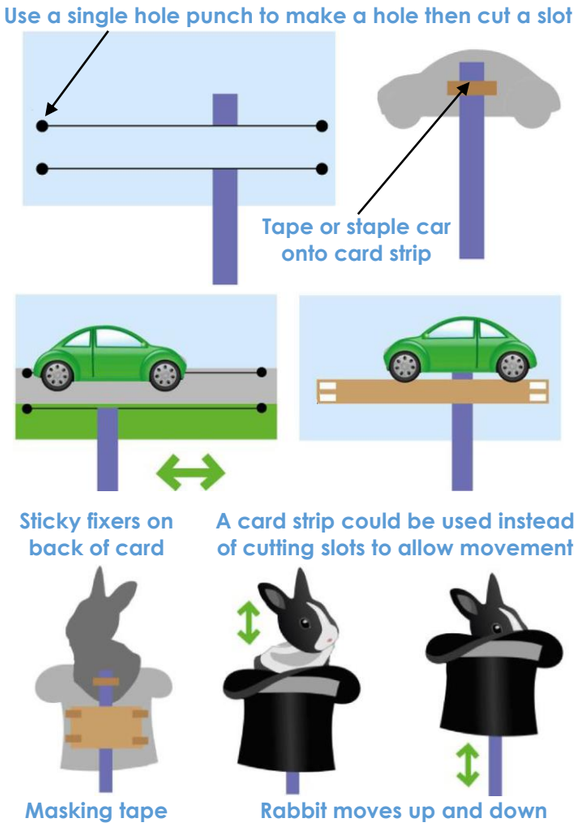
Useful resources at www.data.org.uk

- 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

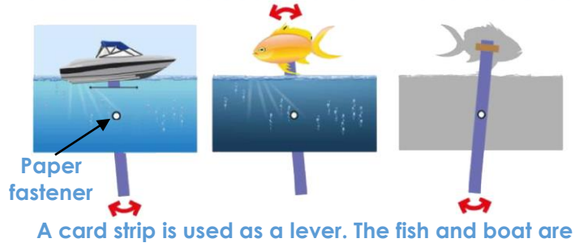
Teaching aids to demonstrate sliders and levers



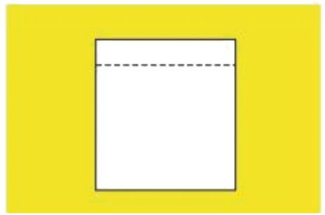
Sliders move from side to side and up and down



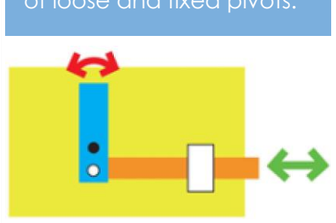
Levers can be used with or without a slot



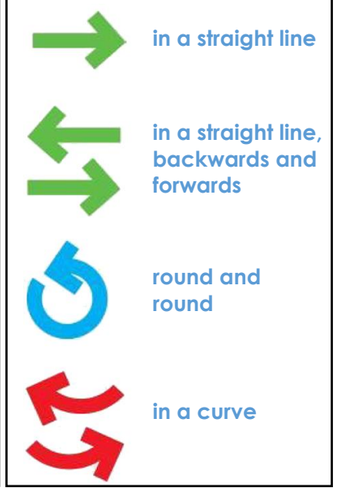
As an enhancement to this project children could add flaps to their moving pictures. Some children may find flaps, which can be used to make a picture appear and disappear, easier to make than levers or sliders.



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.



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.