Whether they are books with simple flaps, devilishly complex lever and linkage mechanisms or extravagant pop-ups, children never seem to tire of the magic of the moving picture book. They are often the most worn and well-used books in the school library and children enjoy bringing their own ‘lift the flap’ and ‘pull the tab’ books into school. All of which is great news for teaching the new National Curriculum for D&T. ‘Mechanisms’ continues as a requirement in key stage 1, progressing to more sophisticated ‘mechanical systems’ in key stage 2. Whilst the technical knowledge associated with this strand of D&T can seem daunting, projects focusing on moving pictures created with paper and card provide an affordable, accessible and educationally sound way to develop children’s understanding.

In addition to developing their mechanical know-how, children engage in many other aspects of the subject including generating, developing and modelling their ideas and learning cutting, joining and finishing skills. Crucially, the completed products will be genuine D&T: fit for purpose, aimed at particular users, fully functional and within a context that is authentic and credible for children.

**Today we will...**
- Look closely at a collection of existing moving picture books
- Develop your knowledge about levers and linkages
- Learn new technical vocabulary about mechanisms

**Starter activity**
Before they create their own greeting cards, picture books or cartoons with moving parts, it is really important that children develop their knowledge and skills through focused practical tasks, and have a go at making mock-ups and prototypes. To get started they also need to spend time learning about the mechanisms used in a range of existing books.

A few days before you start your D&T project on moving pictures, ask volunteers to bring into school their favourite moving picture books to present to the rest of the class. Don’t worry at this stage if children bring in books that are much more complicated than they those they will eventually make themselves. The important thing is to capitalise on children’s enthusiasm and find out what experience they are bringing to the project. It is helpful to provide the volunteers with some prompt questions – for example:

- What is your book about?
- Is it linked to an interest or hobby?
- Who is your book’s intended audience?
- Which is your favourite page?
- What parts move on the page?
- What do you have to do to make the pictures move?

Explain to the class that during this lesson they will be learning knowledge and skills that will be really helpful to them in this term’s D&T project. After each volunteer’s presentation, ask the class to say what they like about the design of the books, noting the children’s ideas on your whiteboard. Their ideas might be to do with cleverness of the design or the sense of novelty or surprise they create.

**MOVE WITH the times**

Get one step ahead of the new National Curriculum with [Gareth Pimley’s](http://www.pimley.co.uk) guide to designing products with moving pictures for a specific purpose and audience...
levers and sliders. where children use simple builds on work in key stage 1 movement in the picture. This strips) will move, causing pushes or pulls the end of a means that when the reader linkage’ mechanisms, which should be creating ‘lever and linkage mechanisms. Initially it is aimed at younger children. At this stage it is important to carefully select books that include mechanisms similar to those children will make themselves, even if the some of the techniques used are different. For instance, Lucy Cousins’ Maisy Classic Pop-up Books are ideal for this purpose, even though the text is aimed at younger children. At key stage 2, most children should be creating ‘lever and linkage’ mechanisms, which means that when the reader pushes or pulls the end of a card strip, another card strip (or strips) will move, causing movement in the picture. This builds on work in key stage 1 where children use simple levers and sliders.

Main activities

1 Discussing moving picture books
As a whole class, introduce and discuss a collection of books with moving parts. At whom are the books aimed? Are they part of a range? Has anyone read them before? What do you like or dislike about the books? How have the illustrations been produced? Why do authors put moving pictures into books for children?

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2 Investigating and analysing
When analysing the books with the class, choose pages that focus on particular types of mechanisms. Initially it is helpful to find pages with simple flaps, levers and sliders to check whether children have the necessary prior knowledge from key stage 1, before looking at pages with lever and linkage mechanisms. The quality of your questioning will determine the technical understanding and vocabulary children take forward to their own designing and making.

Use your knowledge of the children to pitch and sequence the questions. What part of the picture do you think will move? How will it move? How do you make it move? What part of the picture actually moved and how? What parts does the mechanism have? How do you think it works? From what materials is the mechanism made? How successful is it? What other parts of the picture could move? What mechanism might you use for this purpose? Ask volunteers to show how to operate the pictures you are looking at to keep the session as lively and interactive as possible. Next, working in pairs or groups, ask the children to look at the books using the same framework of questions, and to come up with their own questions.

3 Developing technical vocabulary and design criteria
Start to build a bank of specialist vocabulary with the children on your whiteboard, based on their investigation of the moving picture books. Some of the vocabulary will be about the mechanisms themselves (e.g. tab, slot, lever, linkage, pivot) and some will be about the type of movement created (e.g. straight line, to and fro, curved, up and down). Where possible, develop directional language further:

- Linear – movement in a straight line
- Reciprocating – movement in a straight line, forwards and backwards
- Rotary – movement round in a circle
- Oscillating – movement in an arc, forwards and backwards

To round off the lesson, ask the children to suggest design criteria for a successful moving picture. They may suggest that to be effective it should work smoothly and reliably, be robust, show the reader where to operate it, produce the right type of movement for the picture and produce a humorous or surprising outcome.

Extending the lesson

- The next step is for children to practise their skills and further develop their knowledge and understanding by making lever and linkage mechanisms based on a range of teaching aids. This is typically followed by negotiating a design brief with the children, drawing up design criteria, working towards the final outcome and testing its effectiveness with the intended user. For great resources and publications to support this project visit the Design and Technology Association’s website – data.org.uk
- To move children’s learning on, the new National Curriculum says they should ‘understand and use mechanical systems’. A system is a set of related parts or components that work together to produce a desired outcome. Children can explain how their own and existing products work in terms of the ‘input’, where the user moves the mechanism and the ‘output’, where one or more parts of their pictures move.

ABOUT THE AUTHOR

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