

Learning objective	Success criteria
To use layers and spacers to cover the working of mechanisms.	- I can complete the mechanisms and structures as detailed in my design template. - I can make my book look neater and more attractive by using layers and spacers to hide relevant parts of my mechanisms.

Before the lesson

Watch

Teacher video: Using layers and spacers

Pupil video: Using layers and spacers

Have ready

- *Presentation: Odd one out.*
- A selection of pop-up/interactive books and greetings cards (enough for some on each table).
- Model pop-up book (see [Lesson 1: Pop-up book page design](#)).
- Children's completed *Activity: Pop-up book design template* from [Lesson 1: Pop-up book page design](#).
- Children's book structures so far.
- Scrap or smaller pieces of card for the mechanisms and structures.
- Thick or corrugated card to make spacers.
- Scissors (one pair per pupil).
- Glue sticks (enough to share per table).
- Paper fasteners/split pins (the number needed depends on how many children have used this mechanism and how many times they have used it).
- Rulers (one per pair).

Print in advance

- Activity: Jack and Jill moving pop-up parts (support - see Adaptive teaching).
- Activity: Jack and Jill book template (support - see Adaptive teaching).

Cautions

The information within this section provides basic generic guidance only and is not tailored to the circumstances of your school or class. You must ensure you refer to and follow your own school's health & safety policy and complete any necessary risk assessments. It is the teacher's responsibility to check all resources and lesson content to ensure it is suitable for their class setting.

Health and safety

This lesson involves cutting card with scissors and making holes to fasten levers.

- Remind the children of safety rules around using scissors.
- The children should use the technique shown in the Pupil video for making holes in card, using a rubber and a blunt pencil.

Recap and recall

Display the *Presentation: Odd one out* and arrange the children in pairs. Ask them to discuss the meaning of the three words introduced in the previous lessons and decide which they think is the odd one out and why.

Presentation: Odd one out¹

Take feedback. The children should notice that a spacer is the odd one out because levers and sliders are different types of moving parts or mechanisms, whereas a spacer is a structure used to hide mechanisms by attaching a layer on top or to restrict the movement of levers or sliders.

Attention grabber

Explain that in this lesson the children will begin to consider the finished **aesthetic** or appearance of their pop-up book to ensure that the finished product is of a high quality.

Play the *Pupil video: Using layers and spacers* which explains how to decorate a pop-up book to hide the mechanisms and make them more 3D using layers and spacers made with squares of card, card zig-zags or thicker corrugated card.

Pupil video: Using layers and spacers

Point out that the video demonstration uses the Jack and Jill templates for the layers but the children are free to create their own designs to illustrate the stories they chose for their books.

Main event

Recap the mechanisms used so far using either the model pop-up book or any relevant work produced by the children.

Hand out the children's completed *Activity: Pop-up book design template* from [Lesson 1: Pop-up book page design](#), the children's book structures so far, scrap or smaller pieces of card, thick or corrugated card, scissors, glue sticks, rulers and paper fasteners/split pins (as needed).

Ask the children to glue their mechanisms and structures in the positions they marked out last lesson and then attach spacers and layers to hide the mechanisms for a neat finish.

Set a time frame for the children to work to, for example, by the end of the lesson all mechanisms/structures should be complete.

Wrapping up

Ask the children to review each page against their original designs. Discuss the following questions:

- Have you stuck to your plan or have you deviated? Why?
- Is your practical work better than your original designs? Why?
- Can you think of what you need to do to improve it next lesson?
- Have you produced the outputs you planned?

Vocabulary

Aesthetic

How an object or product looks.

Layers

Shapes cut out from paper or card, illustrated and glued to spacers to hide mechanisms underneath.

Spacers

Small pieces of slightly raised card used to restrict the movement of a slider.

Assessing progress and understanding	Adaptive teaching
Pupils with secure understanding indicated by: assembling the components necessary for all their structures/mechanisms; hiding the relevant parts of the mechanisms with layers using spacers where needed. Pupils working at greater depth indicated by: producing more demanding mechanisms/structures; making to an exceptionally high quality (neatly and accurately cut and assembled).	Pupils needing extra support Should simplify designs and/or use the <i>Activity: Jack and Jill moving pop-up parts</i> (support) and the <i>Activity: Jack and Jill book template</i> (support) for the page backgrounds. Pupils working at greater depth Should introduce a diverse range of mechanisms, structures or a combination of both.