Christmas Engineers

How are products and decorations manufactured?

WMG
THE UNIVERSITY OF WARWICK

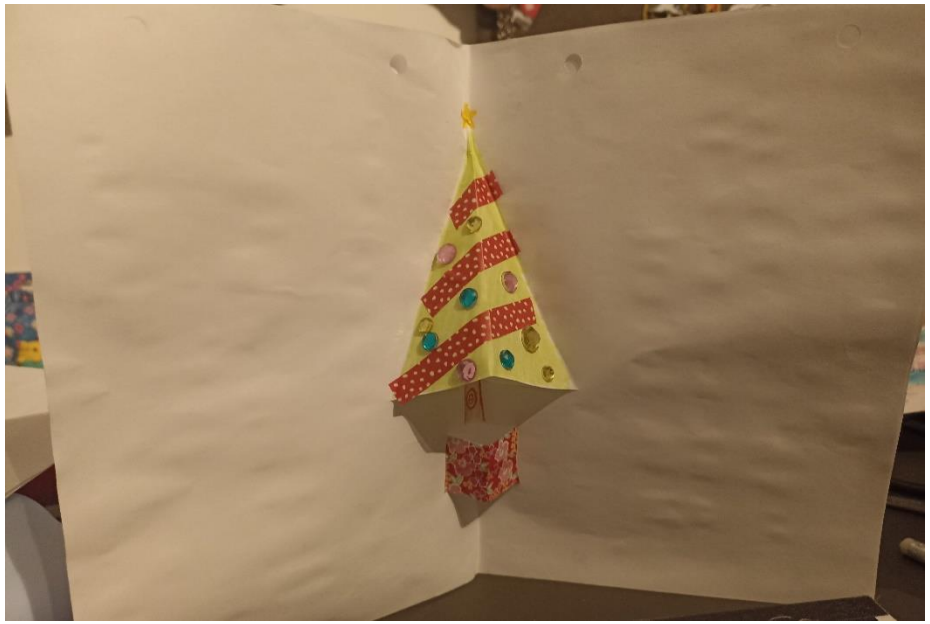
LO: we are learning how a 3D shape can be made from flat (2D) sheets of paper.

Success criteria:

- I can describe how folding a flat (2D) sheet of paper makes it a 3D object.
- I can describe how different cuts and folds can make different 3D shapes.
- I can make a pop-up card following instructions.
- I can make a pop-up card from a blank piece of paper.
- I can identify advantages and disadvantages of making 3D shapes from flat sheets.

Manufactured Products

1. Look at these example pop-up cards.

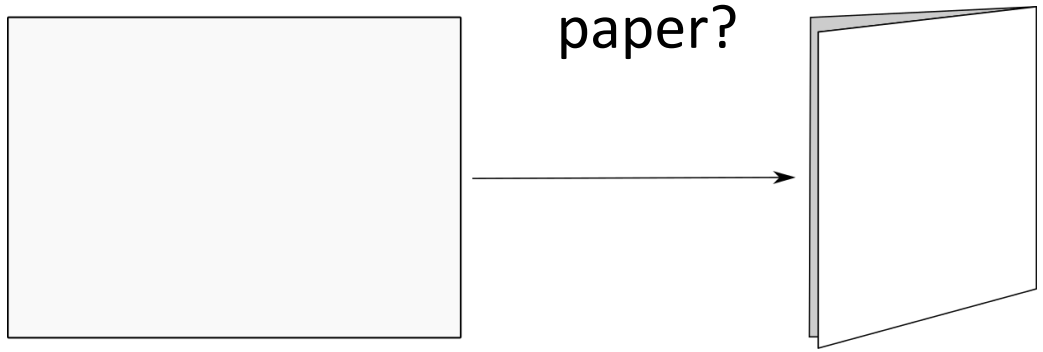


2. **Discuss**:

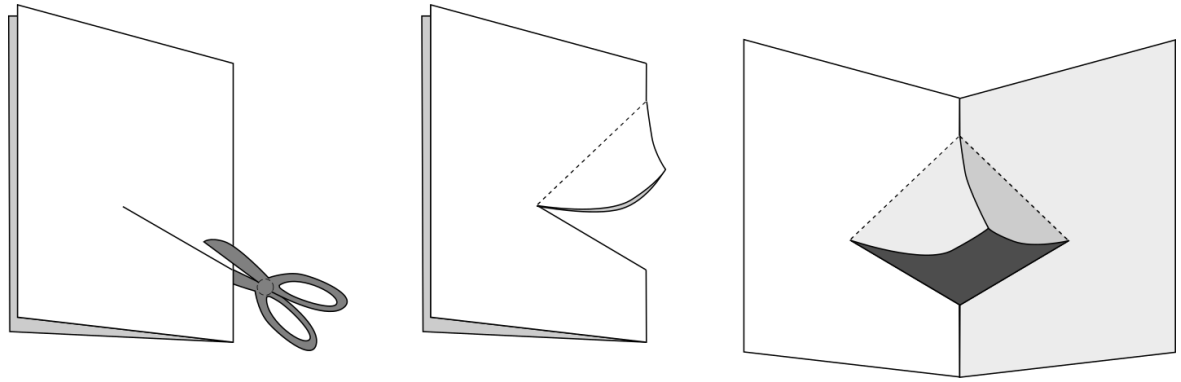
- What material are they made of?
- What features make the product stable?
- How were the pieces made?

Folding Techniques

What shapes can you make just by folding paper?



By cutting slits and folding around them, we can make much more interesting shapes!



Today, we're going to use these techniques to make our own pop-up cards!

What are the advantages of making a pop-up card instead of gluing additional figures on?

What are the disadvantages?

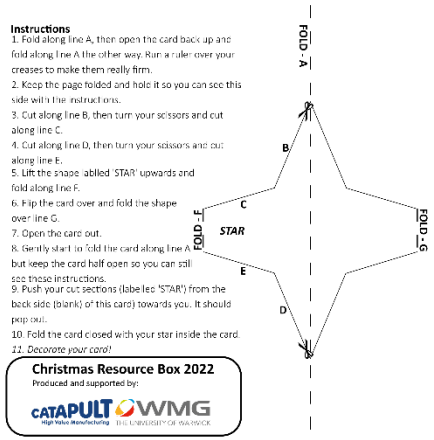
Think about making the card and the person receiving it.

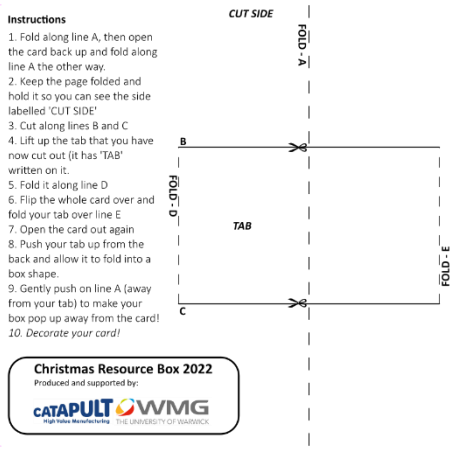
Construction techniques

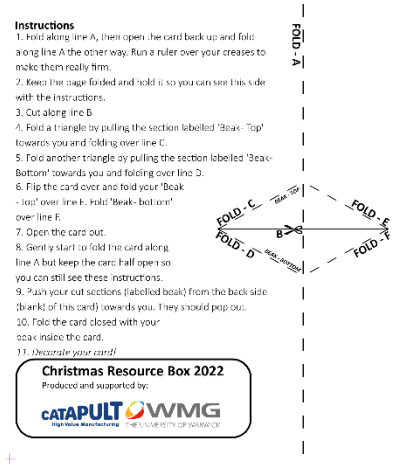
Watch the video about paper construction techniques you could use: bends, folds, slots.

Video link: WMG outreach - primary schools – paper engineering resource box (warwick.ac.uk)

Pop-up Cards – Blank Templates



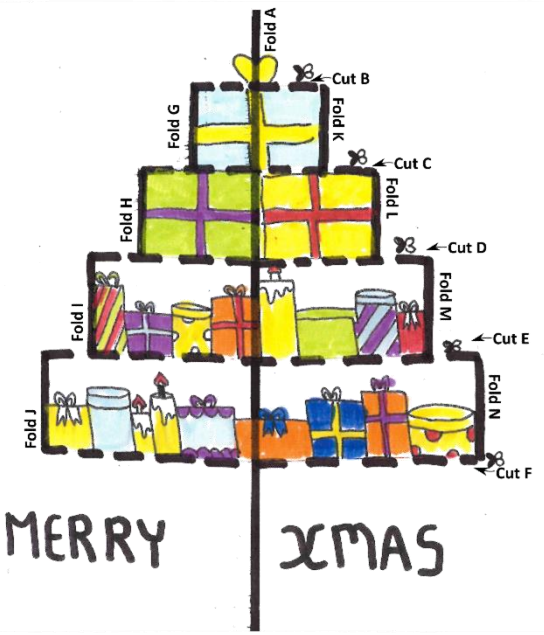




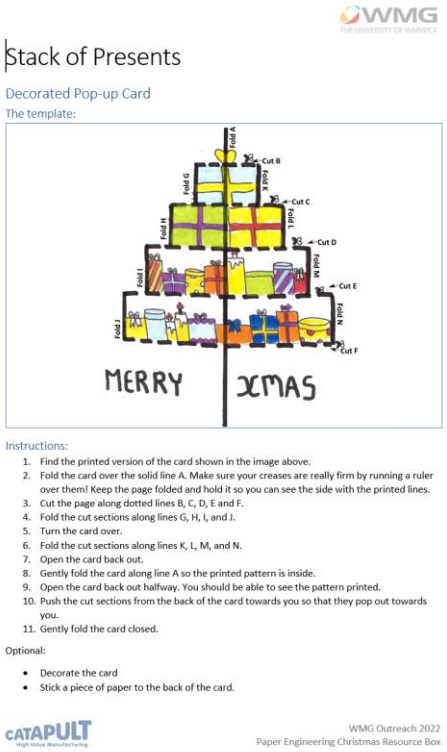
Follow the steps on your template. Think about how the flat sheet turns into a 3D object!

Pop-up Cards – Decorated Templates

1. Choose the card you want to make.



2. Find the matching instructions and follow



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Stack of Presents

Decorated Pop-up Card

The template:

Instructions:

1. Find the printed version of the card shown in the image above.
2. Fold the card over the solid line A. Make sure your creases are really firm by running a ruler over them! Keep the page folded and hold it so you can see the side with the printed lines.
3. Cut the page along dotted lines B, C, D, E and F.
4. Fold the cut sections along lines G, H, I, and J.
5. Turn the card over.
6. Fold the cut sections along lines K, L, M, and N.
7. Open the card back out.
8. Gently fold the card along line A so the printed pattern is inside.
9. Open the card back out halfway. You should be able to see the pattern printed.
10. Push the cut sections from the back of the card towards you so that they pop out towards you.
11. Gently fold the card closed.

Optional:

- Decorate the card
- Stick a piece of paper to the back of the card.

CATAPULT

WMG Outreach 2022
Paper Engineering Christmas Resource Box

3. Make the card

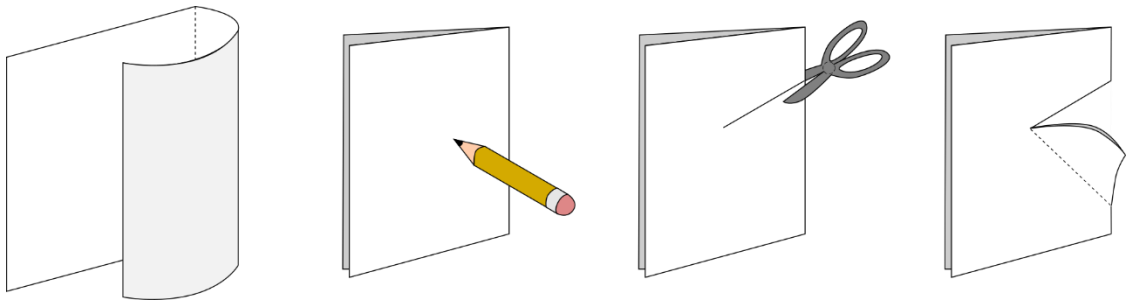
Now that you have practised making 3D objects out of paper, you are going to design and make your own idea to create a pop-up card.

Designing your own figure

What design would you like your card to end up with?

Which parts of your design should pop out of the card?

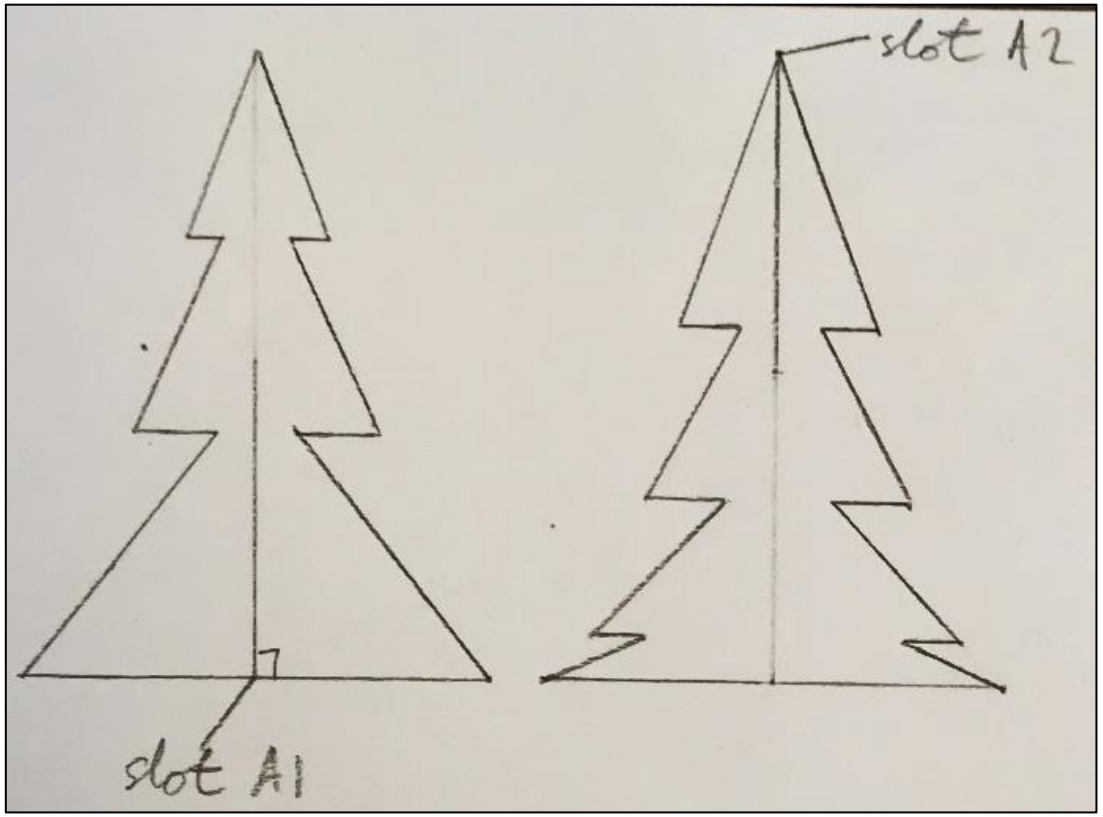
Can you use one of the existing pop-up techniques to help you?



Steps:

1. Fold your page in half
2. Draw your design on one half
3. Cut to make slots where you need them
4. Fold your card to make the shape you want
5. Decorate the rest of the card

Example design



Swap your cards and look at someone else's.

What is successful about their design?

What improvements could they make?

Share your photos of the class's designs on Twitter:
@wmgwarwick #WMGoutreach