Pop-ups Design Guide

Pop-up cards and books

Ingenious pop-up images bring graphics to life and always introduce an element of surprise. A successful pop-up design is the result of the image, message and mechanism all working together effectively.

Answering the following questions will help you get the balance right.

Who is it for?

Many pop-up cards and books are aimed at the younger age group, but a pop-up can provide an exciting way to convey information to adults.

You must be clear about the type of person you are designing for. An understanding of things they find appealing or amusing will help you decide on a style and theme for your design.
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What will it look like?

Certain images have become clichéd and over-used. For example, an obvious idea for a Christmas card would feature a robin or Christmas tree. To help you devise an imaginative and original pop-up, it is important to research the theme and use brainstorming exercises to discover a richer source of images.

Give careful thought to the style of decoration of your design and the effect that you want to create. A pop-up storybook could use bright colours and an amusing cartoon style to encourage a child to learn to read, whereas a get well card for an elderly person would require a more gentle, cheerful style.

Remember that too much decoration may distract from the three-dimensional image. A pop-up can look impressive left quite plain.

You will need to consider the appearance of the message or text. The style of the lettering and the layout of the words should be attractive, but also suit the image of the pop-up design.

How will it work?

Pop-ups use a variety of different mechanisms. Some are very complicated, but even the most basic can have a lot of visual impact. It is useful to study pop-up books and cards and analyse how they are constructed. You can adapt a mechanism for your own design. You will find instructions for pop-up mechanisms opposite.
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Card mechanics

Here you will find techniques to help you make card and paper mechanisms for pop-ups. You can adapt these examples to create imaginative designs of your own.

Materials

Papers and card can be bought in a wide range of colours, textures, thicknesses and weights. This brief guide will help you decide on a suitable thickness of material. You will find more detailed information in the Paper and Card Chooser Chart.

The backing sheet on which the pop-up is built should be strong enough to open without buckling. For pop-ups that involve a lot of stresses and strains, use a rigid, heavy weight of card, such as mounting board. For the pop-up design, you can use thick paper, such as cartridge paper, or thin card. Card that is too thick will be too bulky to fold flat and thin paper will not keep its shape when the page is opened.

Decoration

Take care when using water-based paints to colour your design. Too much moisture will wrinkle the surface of paper and cause thin card to warp. You can achieve effective results with markers, pencil crayon and pastels, or use a colour photocopy of your original artwork.

Scoring and folding

Scoring makes it easier to produce a neat fold. Using a metal ruler as a guide, run the tip of a scalpel along the line of the fold. Only the surface of the card should be cut (do not cut too deeply or the card will break). The card is then folded away from the score line so that it can open slightly along the cut. You will find that the card bends and folds accurately. Remember that paper and card will fold more smoothly with the direction of the grain.

Remember – when using a sharp knife or scalpel with paper or card take great care!
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Pop-up mechanisms

The V fold
This is a simple but versatile mechanism. The pop-up images are attached to the page by means of V-shaped flaps or an inverted V shape, depending on the effect that you wish to create.

1. Apply glue to the undersides of the tabs and attach them to the backing sheet so that the point of the V touches the central fold line.

2. If the angle of the V is 90 degrees, the pop-up will stand vertically when the card is open. If the angle of the V is less than 90 degrees, it will lean backwards, but if it is more than 90 degrees, it will lean forwards.

The pop-up box
This design is based on the V-fold mechanism. The hollow box shape can be modified to create all sorts of objects.

1. Scale up the diagram to the required size. Cut it out and score along the fold lines.

2. Apply glue to the end tap and fold to join the sides of the box. Making a square ‘tube’.

3. Apply glue to the lid tabs. These will look neater if they are attached to the inside of the box – but will have more strength if they are glued to the outside. You will have to decide which is more suitable for your design.

4. Fold back the base tabs inwards and glue these to the backing sheet using the V-fold technique.
Layered mechanisms

This mechanism is based on parallelograms and involves accurate measuring, but, again, is quite simple to make.

The single layer

1. Cut a strip of card, allowing for glue tabs and fold as shown checking that the pop-up will not protrude outside the card when it is closed.
2. Find the correct position by holding the strip in place with paper-clips. All parts should be parallel to one page or the other. Mark the position for gluing with a pencil.
3. Glue tabs in place. The pop-up design can be glued onto the moving layer.

Floating layers

This mechanism uses a similar construction technique to multiple-layer pop-ups. The layers are positioned to support a design that spans the page, increasing the impression of depth.

Incised mechanisms

Using this mechanism, you can create quite complicated designs from one piece of card with no gluing.

1. Mark in pencil the central fold line on the backing sheet.
2. Draw the layer mechanisms at 90 degrees to the central fold.
3. Position as shown in the diagram. Rub out the pencil central fold line on the layer.
4. Measure AB (the distance between the short end and the central fold).
5. Mark the same distance at the other end. This line will be formed into a fold on the finished mechanism.
6. Now cut and fold your drawing to create a layer mechanism from one sheet of card.

This technique can be used to produce a multiple-layer effect or to create the whole pop-up design.

Multiply layers

1. Cut two or three strips of card of different lengths. The length will depend on the size of your card. Allow for glue tabs.
2. Hold in position with paper-clips. Check that the layers are parallel and that the pop-up will not show when the card is closed. Mark the correct positions with a pencil.
3. Glue the tabs in position. Glue the pop-up designs onto the individual layer mechanisms.
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Mechanisms that produce movement

The sliding mechanism

Linear movement can be produced using a sliding mechanism.

1. Cut a slot in the card backing sheet, in the direction of the required movement.
2. Fold two small pieces of card in half and pass these through the slot – as shown.
3. Cut a strip of stiff card as pull tab. The length will depend on the size of your card.
4. Glue this to the back of the two smaller pieces.
5. Near the edge of the card, attach a guide for the pull tab.
6. The image that is required to move can now be glued to the front of the two small pieces of card.

The rotary mechanism

This mechanism will give a circular or rotating movement.

1. Cut a 10 mm hole in the backing card at the centre of the circular movement.
2. Use another piece of card and cut a 30 mm diameter circle. This can be cut to act as gluing tabs. Mark out and cut as shown in the diagram.
3. Stick the centre circle of the tabs to the image that is required to move.
4. Now cut a circle of card that is large enough to protrude beyond the backing card. Push the tabs through the hole and glue them to the centre of the disc. This will provide a wheel to turn the image on the front of the card.

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