

Unit 3D Photograph frames

Focus – structures

ABOUT THE UNIT

In this unit, children learn about stiffening materials and making stable structures through the context of free-standing photograph frames. The unit uses readily available materials and examples. Children might design a product for their own use or as a gift for a particular user.

The unit could be adapted by using a picture or by making a frame to display a special piece of work.

This unit is an appropriate alternative to Unit 3A 'Packaging'.

PRIOR LEARNING

It is helpful if the children have:

- used construction kits
- used a range of cutting and joining techniques

This unit builds on Units 1A 'Moving pictures', 1B 'Playgrounds', 1D 'Homes' and 2C 'Winding up'.

It also builds on Science Unit 2E 'Forces and movement'.

VOCABULARY

In this unit, children will use words and phrases relating to:

- designing *eg user, choice, decoration, quality, component parts, purpose*
- making *eg planning, order, rolling, layering, cutting, finish, board*
- knowledge and understanding *eg stable, free-standing, stiffen, frame, sturdy, reinforce, quality, distance, near, close, wide, narrow, deep, shallow, thick, thin*

RESOURCES

- examples of stable structures *eg mug tree, tripod, stool, music stand*
- examples of free-standing photograph frames
- camera and film
- variety of construction kits, suitable for developing understanding of structures
- materials for decoration *eg paint, fabric, colour magazines for collage, sequins*
- newspaper, board, thick card, thin card, recycled card *eg cereal-packet card, acetate sheets eg overhead transparencies, squared paper*
- PVA glue, masking tape, paper clips, scissors, snips, pipe-cleaners

EXPECTATIONS

at the end of this unit

most children will:

have gained an understanding of ways in which structures can be made stable, recognising conflicting demands on the structure; have designed and made a complete personalised free-standing photograph frame, appropriate for a particular person

some children will not have made so much progress and will:

have a limited understanding of ways in which structures can be made stable; have made, with support, a free-standing photograph frame

some children will have progressed further and will:

have considered a greater range of ways of making structures stable, justified their choices when making their frames and created a frame that matches their design criteria; have considered a variety of ideas for shape, finish and appearance and will have drawn some of these before making; have evaluated their frames in relation to their design criteria

LEARNING OBJECTIVES

POSSIBLE TEACHING ACTIVITIES

LEARNING OUTCOMES

POINTS TO NOTE

CHILDREN SHOULD LEARN

CHILDREN

INVESTIGATIVE, DISASSEMBLY AND EVALUATIVE ACTIVITIES (IDEAs)

- why it is important for structures to be stable
- the effectiveness of triangulation in structures
- that some structures are made stable by having a wide base
- to disassemble and evaluate familiar products

- Ask the children to investigate a collection of free-standing items *eg mug tree, music stand, tripod. Why is it important that they are strong and stable? How are different products designed to be strong and stable? What would happen if the music stand had two legs instead of three?* Highlight the fact that some products are made stable by having a wide base.
- Show the children a variety of photograph frames and ask them to identify how they are able to stand up.
- Ask the children to compare the frames in terms of different features *eg how it stands up, how it looks, how easy it is to put a photograph in, how well it displays the photograph. Who would use it? What kind of picture is it for? Where would it stand?*
- Provide opportunities for children to discuss the component parts of the frames and what each is for. Ask the children to draw one or two of the frames from different views and to label the component parts and their purposes.
- Discuss the frames in terms of the children's favourites and who might like the style of different frames *eg child, grandparent.*

- know why it is necessary for structures to be stable
- know how the examples of free-standing structures have been made to stand up by examining familiar or similar products
- identify component parts of the photograph frames and describe what each is for
- understand the principles of triangulation in simple structures
- compare photograph frames by talking about their features

Links to this unit

Design and technology: Unit 4B 'Storybooks'

Science: Unit 3C 'Characteristics of materials'

Information technology: Unit 3A 'Combining text and graphics'

Mathematics: Number (add, increase, decrease), measurement (standard measures, centimetre, millimetre, metre)

Art: Experimenting with visual elements, *eg pattern, shape, colour*

Content

- The children should have opportunities to look at a variety of frames including ones the teacher has made using paper and card. Try to find examples that show a variety of ideas.
- Give children time to experiment with ways of making small pieces of board stand up as prototype frames.
- There is often confusion between 'strength' and 'stiffness'. 'Stiffness' is to do with how easy it is to bend or stretch something; 'strength' is to do with how easy it is to break something.

Class management

- A wide range of joining techniques could be used, but for manageability it may be easier to limit this *eg only masking tape, paper clips and PVA glue*. Paper clips can hold frame stands that are glued on whilst they dry.
- Prepare the frame shapes as board can be difficult to cut from a large sheet.
- Varnishing over the paint will create a good finish but this would need to be done by an adult in a well-ventilated area.

Health and safety

When carrying out a risk assessment for this activity, teachers will need to consider the materials, tools and equipment being used.

In addition, the following points should be noted:

- care should be taken with photograph frames that contain glass
- precautions will need to be taken if varnish is used. Check product instructions carefully

Out-of-school activities and homework

There are opportunities for children to investigate free-standing structures at home and to make labelled drawings.

Ask children to draw a kitchen stool, chair or clothes airer.

FOCUSED PRACTICAL TASKS (FPTs)

- ways of making stable structures
- ways of strengthening paper
- to evaluate different joining methods

- Ask the children to construct stable structures using construction kits *eg a chair, a bridge of given dimensions.*
- Demonstrate to the children ways of stiffening paper and card *eg by rolling, folding and layering* and encourage children to explore these along with different methods of joining *eg glue, tape, paper clips.*
- Ask the children to investigate ways of making free-standing structures from a limited number of pipe-cleaners.
- Provide the children with a small piece of board and ask them to investigate ways of making it stand up using paper.

- describe ways of making strong and stable structures
- know how to strengthen paper and card in different ways
- select and use appropriate joining techniques

DESIGN AND MAKE ASSIGNMENT (DMA)

Design and make a free-standing photograph frame for a particular person

- to consider who they are designing for
- to implement their prior learning about stiffness and stability into their design proposals
- to make drawings with labels when designing
- to evaluate their product against their original design criteria

- ★ Discuss with the children who their frame is being designed and made for *eg a frame containing a photograph of them as a gift for a relative or friend*. With the children, list some shared criteria. *What will your frame need to do in order to be successful?*
- ★ Encourage the children to consider how they are going to make their frame a stable structure and how the photograph will be fitted into the frame. *How will you make it stable? How will it stand up? Where are the weak points? How could you reinforce them?*
- ★ Ask the children to draw and label how they would like their design to look considering the basic frame shape that they will be given and the user's preferences in colours and designs, as well as how it will stand up.
- ★ Discuss the order in which the children will do things.
- ★ Arrange for the children to take photographs or choose pictures to go in their frames.
- ★ Encourage a good quality of finish.
- ★ Ask the children to evaluate their frame according to the shared criteria and their original design criteria. *How could it be made better? How does it meet the needs of the user?*

- apply what they have learnt through IDEAs/FPTs in their designing and making
- suggest how they can make their frame into a personalised gift
- show evidence of their learning in making a strong and stable photograph frame
- show design ideas through drawings with labels
- talk about their work and evaluate their frame according to their design criteria

- essential activities
- ★ assignment stages (all are essential)
- optional activities

