1. DESIGN A BOAT

AGE 7-11

Objectives

To design a boat that will take the maximum number of passengers.

The big questions

How do boats float?
What shape will take the largest number of passengers?

Unit summary

This unit examines the relationship between the shape of a boat and the amount of passengers it holds. Children will investigate different shaped boats to discover the best design.

Background

Water pushes upwards with a force called 'upthrust'. (You can feel this if you try to push a light object such as a balloon or aeroboard under water). The shape of a 'boat' affects the weight (passengers/cargo) it can hold. The more water that the boat displaces the more it will float and therefore the more weight it can take.

Ships are heavy - but they are shaped so that they push aside lots of water. The water pushes back hard enough to keep them floating.

Curriculum links

Science year 5

- identify the effects of air resistance, water resistance and friction, that act between moving surfaces

Design and technology

Design

- generate, develop, model and communicate their ideas through discussion

Evaluate

- evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- understand how key events and individuals in design and technology have helped shape the world

Working scientifically

Lower key stage 2

- setting up simple practical enquiries, comparative and fair test
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

Upper key stage 2

- using test results to make predictions to set up further comparative and fair tests

1. DESIGN A BOAT

AGE 7-11

Resources


Plasticine


Dried peas


Container (eg butter carton) of water

Introduction

Explain that the children will design and make a boat to take the maximum number of passengers with the given materials. For fair testing give each group the same amount of plasticine.

Activity

Suggest they first roll the plasticine into a ball and put it into the water. What happens? (It sinks). Now see if they can get it to float.

Once they have it floating can they get it to take some 'passengers' (dried peas)? Can they alter the shape so that the boat will take more 'passengers' before it sinks?

Plenary

Whose boat takes the most 'passengers'? Why?

Look at existing boats and discuss their design and how successfully they would take passengers.

Follow up session

Make a Cartesian diver (see session Making a diver).