

Shipwrecks Worksheet 2

Sinking and Floating

Key scientific words: Sinking, floating, molecules, density, buoyant, displacement

The definition of a shipwreck is: ‘The destruction of a ship at sea by sinking or breaking up’.

What might have happened to a ship to make it unable to float anymore?

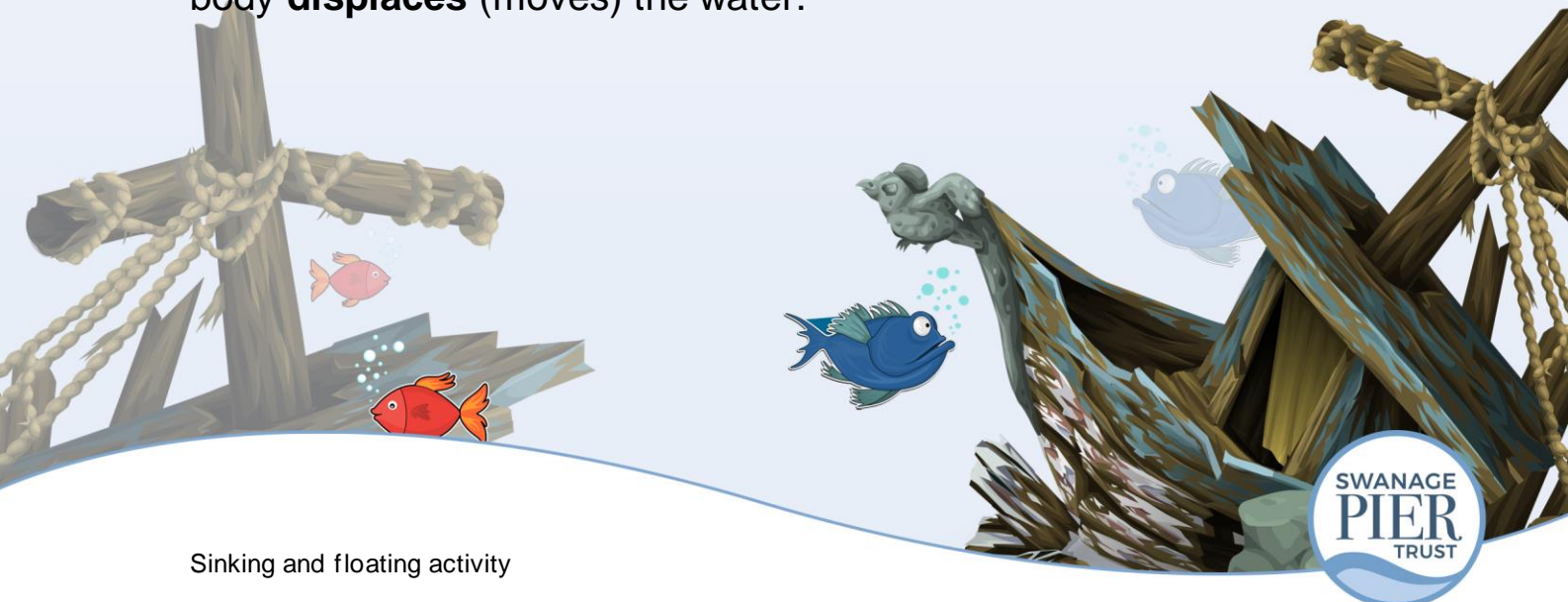
Why do things float in water?

Objects are made up of very tiny **molecules**. Molecules can be packed in close together like in a rock or more spread out like in paper. The positioning of molecules affects the **density** of an object. Objects with tightly packed molecules are **denser** than those where the **molecules** are spread out.

Density plays a part in why some things **float** and some **sink**. Objects that are **denser** than water **sink** and that less dense **float**. Hollow things often **float** too as air is less **dense** than water. This is partly why huge heavy ships **float**.

Another thing to consider is the shape of an object. Generally, the more of the outside of an object that is touching the water the more **buoyant** it is. Water pushes back up against objects so the more surface area an object has the more water pushes back against it helping it to **float**.

When an object **floats**, it pushes water out of the way (**displacement**). Have you ever noticed that when you climb into a bath the water level rises? That’s because your body **displaces** (moves) the water.



Sinking and floating experiment

Objectives: To investigate why boats might **float** and **sink** using a range of materials and objects.

Resources needed:

Paper, modelling clay and tin foil

A timer to see how long each can float.

Washing up bowl of water.

Small objects 1p coins to put on the boats as weight.

Activity

With the three different materials paper, clay and foil make lots of boats like the ones below.

Experiment with the materials and make different sizes and shaped boats if you can.

Examples of boats:

Paper boat



Foil boat

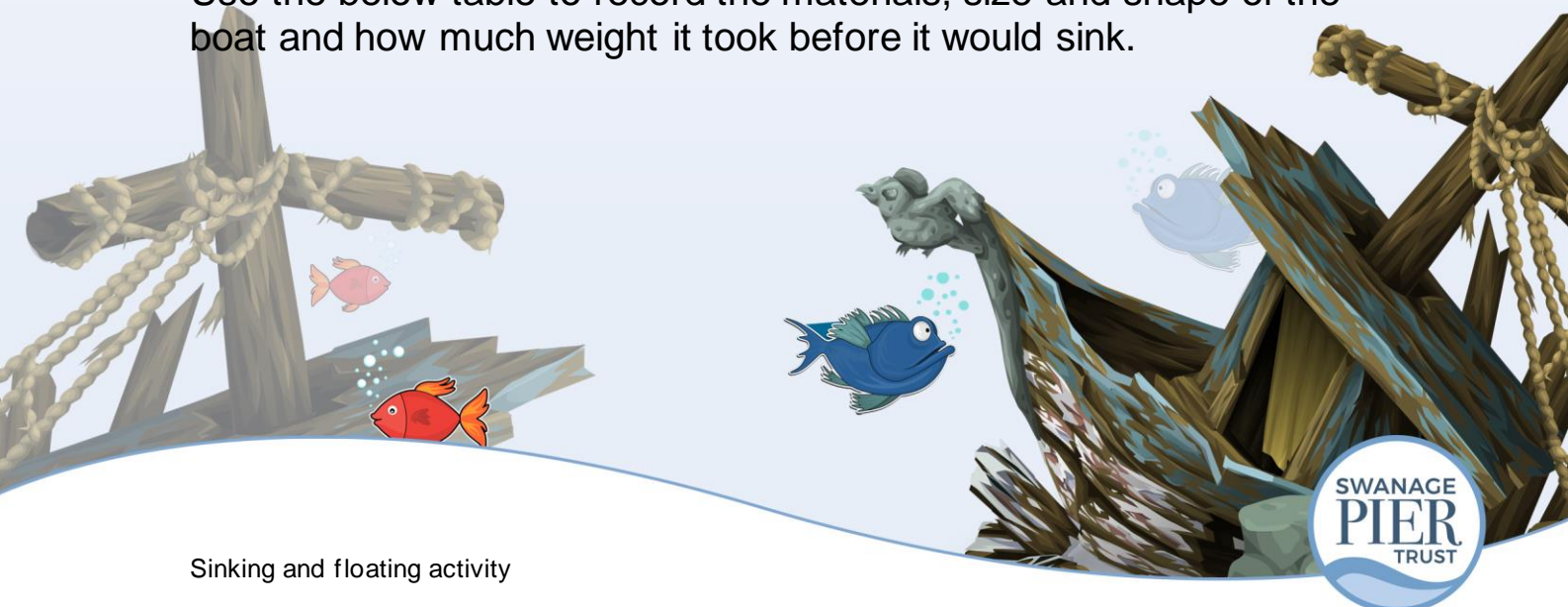


Clay boat



One at a time, put each boat in to the bowl of water and begin with putting small amounts of coins on to it. Slowly increase the number of coins to see the maximum load it takes to make that boat sink.

Use the below table to record the materials, size and shape of the boat and how much weight it took before it would sink.



Material	Size	Shape	How much weight?	How long did it float for with the maximum load?	Notes

Discussion

Try to use some of the key scientific words in your answers: **sinking, floating, molecules, density, buoyant, displacement.**

Which boat was the most successful?

Can you do a drawing of it here and describe it?

Was the most successful boat less dense in its material than the others?

Was it a different shape?

Was it a different size to the other boats?

Was it hollow or did it have air spaces in it?

Was it made of a sturdier (stronger) material?

What can you conclude from your experiments today about the best size, shape and material for a boat to successfully take a heavy load and not sink?

