**ACTIVITY: Will this float or sink?**

**Activity idea**

In this activity, students use an interactive or paper-based graphic organiser to consider whether an object floats or sinks.

By the end of this activity, students should be able to:

* use their prior knowledge to make choices about whether an item floats or sinks
* begin to use appropriate content vocabulary
* begin to provide evidence to support their choices
* discuss their ideas with others who may hold different views.

**For teachers**

***Introduction/background***

Use this activity prior to teaching about floating and sinking to gauge students’ thinking about why some things float or sink. Consider using this activity again – during the teaching process or at the end of a unit for formative assessment.

The science concepts that underpin whether an object floats or sinks – density, displacement and forces – are quite complex. Understanding these concepts and forming accurate conceptions requires time and multiple learning experiences. Experiencing, identifying and describing the patterns associated with this physical phenomenon feature in levels 1–5 of the New Zealand Curriculum. The article [Building Science Concepts: Floating and sinking](https://www.sciencelearn.org.nz/resources/3181-building-science-concepts-floating-and-sinking) has useful background information for educators. The activities [Investigating floating and sinking](https://www.sciencelearn.org.nz/resources/3184-investigating-floating-and-sinking) and [Floating and sinking – exploring forces](https://www.sciencelearn.org.nz/resources/3183-floating-and-sinking-exploring-forces) provide hands-on opportunities for play and observation.

Some of the images in the interactive are not straightforward. This is meant to encourage student thinking and debate. For example, a paper ball or dry pumice may float initially but sink when it becomes waterlogged, and a toy car made of metal may float while one made of plastic may sink. (Pumice is an unusual rock due to its porosity. It is capable of floating, sometimes for years, until it becomes waterlogged and sinks.)

***Alternative conceptions***

Most students will have experiences with floating and sinking – from time spent in the bath, lake or pool. Through play and observation, they will have created their own concepts and explanations regarding why things float or not. They may have also developed personal vocabulary to describe their experiences. It’s important to address content vocabulary. There are many words with common meanings that differ from scientific meanings – for example, ‘float’, ‘sink’ and ‘light’ have multiple meanings

Students often hold alternative conceptions regarding floating and sinking, most commonly involving size and weight. Students will most often think that an object ﬂoats because it is small and/or light and it sinks because it is big and/or heavy. Additional alternative conceptions include:

* the softness of an object – soft objects are more likely to float than hard objects
* hollowness – objects only float because they are hollow/have air inside of them
* where the object sits in the liquid – floating objects must sit wholly above the surface of the liquid
* similarities in weight – if two objects weigh the same they will both float or both sink.

Being aware of alternative conceptions helps educators identify them when they surface in discussions and provides an opportunity to scaffold change.

***What you need***

* Access to the online [Will this float or sink? – graphic organiser](https://www.sciencelearn.org.nz/drag_and_drops/20-will-this-float-or-sink-graphic-organiser) or the paper-based [Will this float or sink? – images and graphic organiser](#bookmark=id.26in1rg)

***Teaching suggestions***

Consider the developmental needs of your students when considering the following teaching suggestions.

***What to do***

1. Briefly discuss students’ experiences with floating and sinking. Use this as an opportunity to take note of students’ use of content vocabulary and possible alternative conceptions.
2. Discuss the individual components of the interactive and how to operate them. (The card needs to show a blue background/border for it to be in one of the boxes.)
3. If required, read the titles of the boxes and the titles of the image cards.
4. This can be a whole-class activity using a shared screen. Encourage students to come up and move the image cards to the appropriate box and to move an image card if they do not agree with its position. Students will need to justify their decisions.
5. Alternatively, the interactive can be completed by individuals or in small groups.
6. If using the paper-based version, cut-up the [images for classifying](#bookmark=id.26in1rg) and place them on the graphic organiser worksheet [Will this float or sink?](#bookmark=id.lnxbz9)
7. If using the paper-based version, discuss where students have placed the objects and their reasons for doing so.
8. If appropriate, ask the students to create a list of characteristics of things that float and characteristics of things that sink. Note any content vocabulary or alternative conceptions that may need to be addressed.

***Extension idea***

After completing this activity, challenge students to create a hands-on version by collecting the objects and testing whether they float or sink in a container of water.

***Answers***

|  |  |  |
| --- | --- | --- |
| **Image** | **Floats** | **Sinks** |
| Pumice | Yes (initially) | Yes (with time when waterlogged) |
| Rock | No | Yes |
| Ping pong ball | Yes | No |
| Golf ball | No | Yes |
| Glass marble | No | Yes |
| Paper ball | Yes (initially) | Yes (with time) |
| Metal spoon | No | Yes |
| Plastic spoon | Yes | No |
| Toy car | Yes (depending on material) | Yes (depending on material) |
| Ice cubes | Yes | No |
| Chalk | No | Yes |
| Modelling clay | No | Yes |

**For students –** ***Images for classifyingLogo, calendar

Description automatically generated with medium confidence***

**Will this float or sink?**

