LESSON PLAN

Density and Floating Layers: Why Some Things Sink

Science · Year 8 · 60 min

CURRICULUM ALIGNMENT

Aligns to The New Zealand Curriculum. Science, Level 4 (Years 7 to 8), Physical World and Material World strands: investigating density as a property of matter and explaining floating and sinking in terms of relative density.

Te Mātaiaho: Science

LEARNING INTENTION

Explain why objects float or sink using the concept of density

SUCCESS CRITERIA

- I can define density as the mass of a substance packed into a given volume.
- I can predict whether an object will float or sink by comparing its density to water.
- I can explain why liquids form layers by comparing their densities.
- I can use the words independent variable, dependent variable, and controlled variable when describing a fair test.
- I can record an observation and connect it to a conclusion using evidence.

Lesson Structure

HOOK

• Three sealed jars: one with a cork, one with a pebble, one with a rubber bung.
• All jars look the same from the outside. Which one sinks?
• Why did that surprise you? What were you expecting?

TEACHING

• Density means how tightly packed the mass is inside a volume.
• Same-size blocks of wood and steel: which feels heavier and why?
• I notice the steel block is heavier but the same size. Its particles must be packed closer together.
• A less dense object floats on a more dense liquid. Always.

PRACTICE

• Layered density column on the bench: honey, water, cooking oil, alcohol.
• Predict where a grape, a cork, and a small plastic bead will settle.
• Thumbs up if your prediction matched. Where did it differ and why?

CLOSURE

• Name one substance in the column denser than water.
• What is density in your own words? No hands, just think.
• Check: can you now predict floating or sinking confidently?

Task Details

TASK

- Each pair chooses one mystery object from the tray.
- Predict: will it float or sink? Write a reason using density.
- Drop it into the column. Record where it settles and why.
- Write one conclusion sentence linking your observation to density.

MATERIALS

Layered density column (pre-made, one per bench group): honey, water, cooking oil, methylated spirits, mystery object tray with items including a grape, cork, rubber bung, small plastic bead, dried pasta, a folded piece of aluminium foil, and a marble (8 to 10 items total), student observation recording sheets (one per student), pencils

TEACHER ROLE

- Circulate every 4 to 5 minutes. Listen for density language.
- Prompt any stuck pair: which layer is densest and why?
- Pause the class at 12 minutes. Cold-call two pairs to share conclusions.

ASSESSMENT NOTES

- Criterion 1: Student writes density definition using mass and volume.
- Criterion 2: Prediction includes a density comparison to water.
- Criterion 3: Conclusion explains layer order by comparing liquid densities.
- Criterion 4: Recording sheet uses independent, dependent, and controlled variable correctly.
- Criterion 5: Observation and conclusion are linked with because or therefore.

RESOURCES

YouTube density floating layers video

Pinterest density floating layers activities

RELIEF TEACHER NOTES

- Pre-made density columns are on the front bench, handle carefully.
- Mystery object trays and recording sheets are in the blue tub on the teacher's desk.
- Task: pairs predict, drop one object, then write an observation and conclusion.
- Any pair struggling: ask them to point to the densest layer first.