**ACTIVITY: Density**

**Activity idea**

In this activity, students are introduced to the concept of density. They calculate the volume of various materials to determine and then rank their densities.

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

* discuss how all matter is made up of particles
* discuss that density is a measure of how closely these particles are packed together
* discuss that the tighter the packing, the more dense the material
* explain that density is measured in units of mass per unit volume
* use formulae to determine density and volumes.

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**Introduction/background**

This activity introduces students to the concept of density. Density is a measure of how tightly a certain amount of matter is packed into a given volume. The more the ‘stuff’ is packed in, the higher the density. Density can be calculated by dividing an object’s mass by its volume. It is commonly measured in grams per millilitre or grams per cubic centimetre.

This activity is adapted from the SEREAD Programme developed in conjunction with NIWA.

**What you need**

* Solid blocks of wood, plastic, metal and brick
* Rulers
* Scales

**What to do**

1. Ask students to rank the blocks in the order of most dense to least dense.
2. Using the ruler, have students measure the length, width and height of the blocks to the nearest centimetre (cm).
3. Have students use these measurements to calculate the volume of the object. This will give the volume in cubic centimetres. The formula is: volume = length x width x height.
4. Have students weigh each object to the nearest gram (g) to get the mass and calculate the density of each object. The formula is: density = mass/volume
5. Ask students to rank the objects in order of the densest to the least dense. How close were they to their original ranking?

**Discussion questions**

* Density tells us something about how tightly packed the particles are. Which object is the densest of the ones you measured?
* The density of fresh water is very close to 1 g/cm3. Objects that are denser than water will sink. Those that are less dense will float. Group your objects into those that will sink and those that will float. Test out your ideas to see if you are correct.