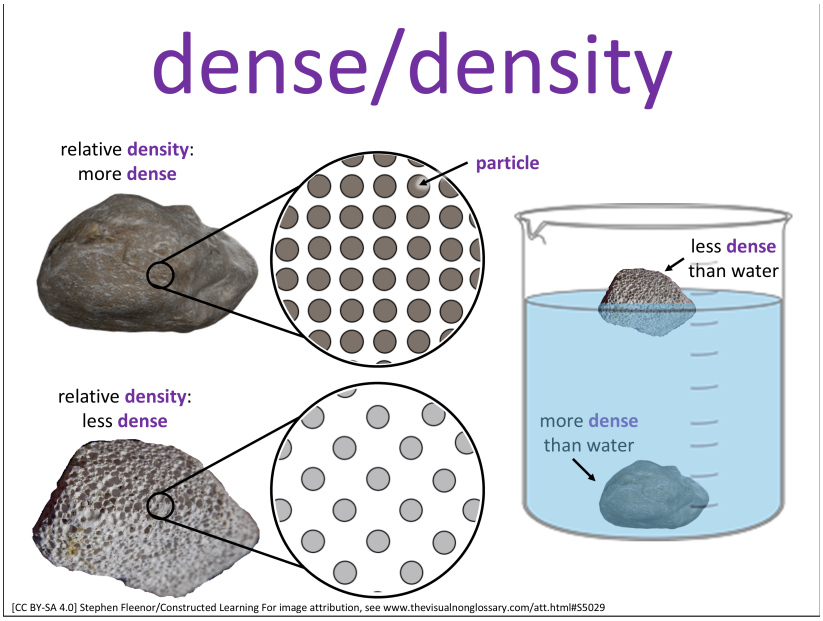
The Visual Non-Glossary™

Understanding Density

The purpose for reading is to understand how density helps us compare and contrast different types of matter.

Look Out For:

- Examples that show when something sinks or floats
- How the particles affect the density
- How relative density of matter can be determined



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All **matter** has **physical properties**. One of these is called **density**. **Density** is how close the **particles** are packed together in something.

Think about a rock and a sponge. They can be the same size, but the rock is heavier. This is because the rock's **particles** are close together. It is more **dense**. The sponge has fewer **particles** and air spaces. It is less **dense**. That is why the rock sinks and the sponge floats.

Now think about a wood block and a small metal nail. The nail is tiny, but it sinks. The wood block floats. The nail is more **dense** than water, but the wood is less **dense**. This shows that **density** is not just about size.

Liquids also have different **densities**. When you pour oil into water, the oil floats on top. Oil is less **dense** than water.

To find out which object is more **dense**, put them in water. The one that sinks is more **dense**. The one that floats is less **dense**.

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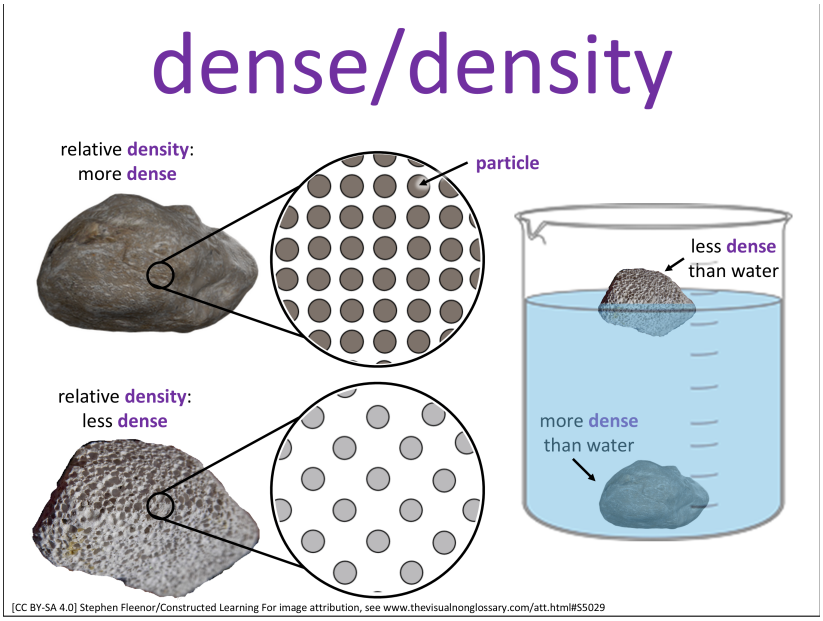
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When scientists compare **matter**, they often look at its **physical properties**. One important property is **density**. **Density** describes how tightly packed the **particles** of a substance are inside a given space. The more closely the **particles** are packed, the more **dense** the substance is.

Imagine holding a rock and a sponge that are the same size. The rock feels much heavier. That is because the rock's **particles** are packed tightly together, making it more **dense**. The sponge, however, has fewer **particles** in the same amount of space, and tiny air pockets make it less **dense**. When both are placed in water, the rock sinks while the sponge floats.

Another example is comparing a wooden block and a metal nail. The nail may be much smaller, but it sinks because it is more **dense** than water. The wooden block floats because it has fewer **particles** packed into its volume, giving it a lower **relative density**. This shows that **mass** and **density** are connected but not the same. A small object can sink if it has a high **density**, while a larger object can float if it has a lower

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density.

Density also explains why some liquids mix and others do not. When oil is poured into water, the oil rises to the top. Oil is less **dense** than water, so it floats above it. This comparison helps scientists and engineers understand how different substances interact.

If you had two objects or liquids and wanted to know which was more **dense**, you could test how they behave in water. The one that sinks is more **dense**, while the one that floats is less **dense**. By observing these results, students can compare and contrast **matter** based on **relative density**, just as scientists do in the lab.

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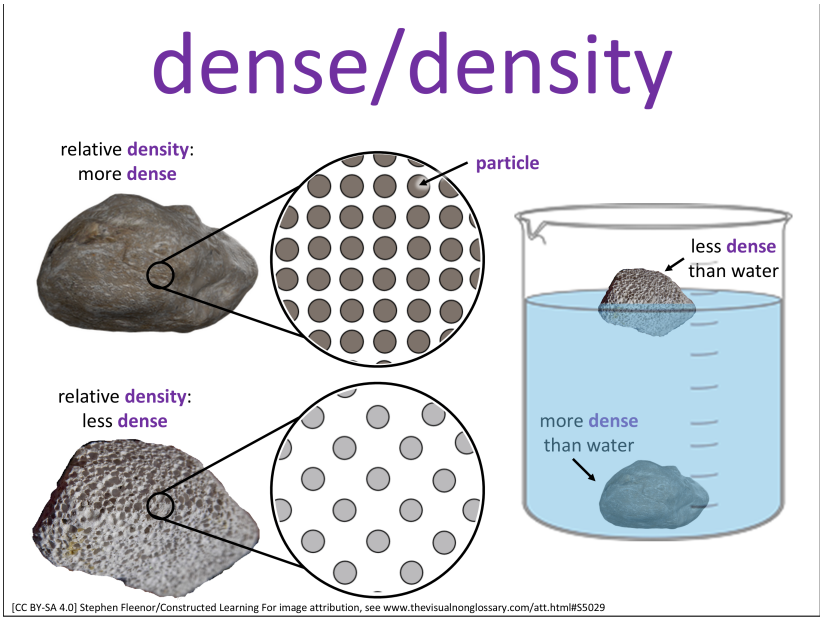
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Scientists study **matter** by examining its **physical properties**. One property that is especially important is **density**. **Density** measures the relationship between the **mass** of an object and the space its **particles** occupy. A substance is more **dense** when its **particles** are tightly packed into a smaller volume.

Consider a rock and a sponge that are the same size. The rock is noticeably heavier because its **particles** are more closely packed, giving it greater **density**. The sponge has fewer **particles** and many air pockets, so it is less **dense**. In water, the rock sinks while the sponge floats.

This idea also applies to a wood block and a metal nail. Even though the nail is smaller, it sinks because its **relative density** is greater than that of water. The wood floats because its **particles** are spread farther apart. This shows that **density** depends on the relationship between **mass** and volume, not on size alone.

Liquids also demonstrate **density** differences. When oil is poured into water, the oil rises to the top because its **particles** are arranged in a way that makes it less

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dense than water. This principle explains why some liquids layer instead of mixing.

To determine which of two substances is more **dense**, scientists often test them in water. The one that sinks has higher **density**, while the one that floats has lower **density**. Recognizing these patterns helps us compare and contrast **matter** based on **relative density** and better understand how materials interact.

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