

## Density

Which is heavier, a ton of feathers  
or a ton of bricks?

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## Overview of Density

- Describes the degree of compactness of a substance.
- Density is mass per unit volume

$$= \frac{m}{V}$$

- Common Units: g/cc, kg/liter, kg/m<sup>3</sup>
- Related to sinking and floating.

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## Density & Superposition

- Superposition: More dense substances will sink beneath less dense substances.
- An example of this is Oil and Water.
  - The water sinks because it is more dense than the oil
- Misconception!
  - Water is heavier than oil.



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### Objects that change density

- Lava Lamp - volume
  - hot light expands waxy goo
- Submarines - mass
  - pump water in or out
- Blimps & Hot Air Balloons - mass
  - maintain volume but let air in or out
- People Swimming - volume
  - expand or collapse lungs
- Stoned Crocodiles? - mass

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### Misconceptions, Exceptions & Common Mistakes

- Misconception
  - Just because something is more dense doesn't mean it is heavier.
- Exception
  - Solid objects don't usually undergo superposition.
  - Example: Car on Asphalt
- Common Mistakes
  - When using the formula to solve for Volume care must be taken with algebra

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