

# The Particle Model of Matter

Time: 20 min. 6 questions.

## Instructions

Answer all six questions using what you have learned about particles, states of matter, and physical properties such as mass, volume, density, and compressibility. Write your answers in complete sentences where needed, and show your thinking for the numeric question.

## Questions

1. In which state of matter are the particles closest together and vibrating in place, rather than sliding past each other or spreading out?  
A) Gas  
B) Liquid  
C) Solid  
D) Plasma  
([Outcome](#))
2. Explain why a gas can be squeezed into a smaller space (compressed) much more easily than a liquid can. Use the words "particles" and "spaces" in your answer. ([Outcome](#))
3. True or false: The particles in a liquid are locked in a fixed pattern and cannot move past each other. ([Outcome](#))
4. There are 1000 grams in 1 kilogram. How many grams are in 1 kilogram? ([Outcome](#))
5. A small toy boat floats when you place it in a bowl of water. Based on the particle model, the material the boat is made from is \_\_\_\_ dense than water.  
A) more  
B) less  
C) equally  
D) cannot be determined  
([Outcome](#))
6. True or false: The attractive forces between particles are strongest in gases and weakest in solids. ([Outcome](#))

## Curriculum coverage

| Question | Outcome alias |
|----------|---------------|
| 1        | Outcome       |
| 2        | Outcome       |
| 3        | Outcome       |
| 4        | Outcome       |
| 5        | Outcome       |
| 6        | Outcome       |

## Answer key

1. C) Solid. In a solid, particles are close together and vibrate in place rather than sliding past each other or spreading apart.
2. A gas can be compressed easily because its particles have large spaces between them, so pushing the particles closer together reduces the volume; a liquid's particles are already close together with little space left to squeeze.
3. False. Particles in a liquid are separated by spaces and can slide past each other, which is why liquids can flow and change shape.
4. 1000 grams. The SI unit conversion for mass is 1 kilogram (kg) equals 1000 grams (g).
5. B) less. An object that floats is less dense than the liquid it floats in, because its mass compared to its volume is smaller.
6. False. Attractive forces between particles are strongest in solids, where particles are packed closely together, and weakest in gases, where particles are far apart.