

Nova's States of Matter Laboratory

Learning objective: To identify and illustrate the physical properties of solids, liquids, and gases by observing particle behaviour.

Help Nova the owl map out how particles move in different states of matter. Use the word bank to label your diagram and show how the particles are arranged.

Draw: Create three distinct square 'viewing windows' side-by-side on your page. In the first, draw a neat, grid-like arrangement of small spheres to represent a solid. In the second, draw a cluster of spheres that look slightly chaotic to show a liquid. In the third, draw only a few spheres scattered widely across the space to represent a gas. Use a clean, scientific, and precise drawing style.



Label words: Solid · Liquid · Gas · Fixed position · Flowing particles · High energy · Vibrating · Random movement

Steps:

1. Step 1: Draw a box containing a solid object (like a rock). Inside the box, draw the particles as tightly packed circles in a regular pattern. Label this box 'Solid'.
2. Step 2: Draw a second box containing a liquid (like water). Draw the particles close together but slightly apart, showing them able to slide past one another. Label this box 'Liquid'.

3. Step 3: Draw a third box representing a gas. Draw the particles far apart with arrows showing them moving in different directions. Label this box 'Gas'.
4. Explain why the particles in a solid cannot move around freely like the particles in a liquid or gas. Justify your answer using the term 'fixed position'.
5. Compare and contrast the movement of particles in a liquid versus a gas. What happens to the space between particles as a substance changes from a liquid to a gas?
6. What might happen to the state of matter if we were to significantly increase the amount of heat energy applied to the particles in your 'Solid' box? Explain your reasoning.