

Nova's States of Matter Sketchbook

Learning objective: To observe and illustrate the particle arrangement of solids, liquids, and gases, and to explain phase changes through scientific drawing.

Follow the drawing prompts to illustrate the behaviour of particles in different states of matter. Use your scientific knowledge to ensure the spacing and movement of your particles are accurate. Use the word bank to label your diagrams.

Draw: Create three distinct square frames on your page. In the first, draw a structured, grid-like arrangement of circles to represent a solid block of ice. In the second, draw the circles clustered at the bottom of the frame to represent water. In the third, draw the circles scattered randomly throughout the entire frame to represent water vapour. Use a clear, technical style similar to a scientific textbook diagram.



Label words: Solid · Liquid · Gas · Particles · Vibration · Energy · Freezing · Evaporation · Condensation

Steps:

1. Step 1: Draw a box containing a solid. Inside, draw closely packed circles arranged in a regular pattern. Label the 'vibration' of the particles.
2. Step 2: Draw a second box showing a liquid. Particles should be close together but irregular. Label the 'flow' of the particles.

3. Step 3: Draw a third box showing a gas. Particles must be spread far apart with lots of empty space. Add arrows to show random motion.
4. Explain why particles in a gas move more freely than those in a solid. Justify your answer using the concept of kinetic energy.
5. Compare and contrast the arrangement of particles in a solid versus a liquid. What is the main structural difference?
6. What might happen to the particles of a liquid if you were to remove a significant amount of heat? Describe the change of state.