

Particles Make Up Everything

30 minutes, 3 stages

Everything around you, your pencil, water, air, is made of tiny particles ([Knowledge](#)). You cannot see these particles, but they are there. The way particles move and sit next to each other explains why a solid feels hard, why water flows, and why air spreads out to fill a room ([Understanding](#)). This homework helps you picture how particles behave in solids, liquids, and gases ([Outcome](#)).

Stage 1: Draw the Three States (10 min)

On a piece of paper, draw three boxes in a row. Label them "Solid," "Liquid," and "Gas."

Inside each box, use small circles or dots to show how particles are arranged and spaced. Remember these three ideas ([Knowledge](#)):

- In solids, particles are close together and vibrate in place. Draw them packed tightly, almost touching.
- In liquids, particles are separated by spaces and can slide past each other. Draw them with a little room between them.
- In gases, particles are separated by large spaces and move in all directions. Draw them spread far apart.

Below each drawing, write one sentence that describes how the particles move in that state.

Stage 2: Match Objects to States (10 min)

Read each object. Write which state of matter it is (solid, liquid, or gas). Then explain your answer using what you know about particle arrangement and movement.

1. A wooden desk
2. Milk in a glass
3. Oxygen in the air you breathe is a gas made up of small particles that are separated by large spaces and are constantly moving in all directions.
4. A chocolate bar
5. Steam from hot water

Example: "A wooden desk is a solid because its particles are close together and vibrate in place, so the desk keeps its shape."

Stage 3: Attractive Forces (10 min)

The particles in matter pull on each other. This pull is called an attractive force ([Knowledge](#)). The stronger the pull, the closer the particles stay together.

Answer these questions:

1. Which state has the strongest attractive force between particles: solid, liquid, or gas? Explain why particles stay so close together in that state.
2. Which state has the weakest attractive force? Why do particles spread far apart?
3. Think of ice melting into water. As the ice melts, what happens to the attractive forces between particles? Do they get stronger or weaker?

Self-check

1. Can you draw and label particles in a solid, liquid, and gas, showing how they are spaced differently?
2. Can you explain why a solid holds its shape but a gas spreads out, using what you know about particle movement and spacing?
3. Can you describe how attractive forces are different in solids and gases?