

Particle Model of Matter Rubric

Task

Students present a labelled model or report on the particle model of matter.

Curriculum Alignment

Students investigate the particle model of matter in relation to the physical properties of solids, liquids, and gases ([Outcome](#)). They represent solids, liquids, and gases using the particle model of matter and relate the movement and arrangement of particles to the state of matter ([Skills](#)). The work assesses understanding that the particle model of matter explains the behaviour of particles in matter ([Understanding](#)) and that the movement and arrangement of particles affect the physical properties of matter ([Understanding](#)).

Rubric

Criterion	Beginning	Developing	Proficient	Exemplary
Representation of particle arrangement	Shows particles in one or two states with minimal or unclear spacing differences.	Shows particles in all three states with some spacing differences; arrangement is partially accurate.	Shows particles in solids (close together), liquids (separated), and gases (widely separated) with accurate spacing.	Clearly shows particle spacing in all three states with precise arrangement and visual clarity.
Labels and identification	Few or missing labels; states of matter not identified or incorrectly named.	Most states identified; some labels present but incomplete or partially unclear.	All three states clearly labelled; particles and spaces identified in each state.	All elements clearly labelled; includes particle movement direction and state names; easy to read.
Connection between particles and state properties	Minimal or no connection made between particle arrangement and state properties.	Attempts to link particle movement or spacing to one or two state properties.	Describes how particle movement and spacing explain why solids, liquids, and gases have different properties.	Explains how attractive forces and particle spacing together account for the physical properties of each state.
Accuracy of particle model ideas	Shows incorrect understanding of one or more core particle model ideas (particles exist, move, have spaces).	Demonstrates understanding of two of the three core ideas; minor inaccuracies present.	Accurately represents all three core ideas: matter is made of particles, particles move, particles have spaces between them (Knowledge).	Demonstrates all three core ideas plus accurate representation of particle movement direction and spacing proportions.

Scoring

Award one level per criterion. A student is **Proficient** when three or four criteria reach the Proficient level. A student is **Developing** when two criteria reach Proficient and two reach Developing. A student is **Beginning** when one or fewer criteria reach Proficient. A student is **Exemplary** when all four criteria reach Exemplary.

Notes for the Teacher

- Check that particle spacing is visually distinct across the three states. In solids, particles should touch or nearly touch; in liquids, small gaps should be visible; in gases, gaps should be much larger. Use a consistent scale or note if the model is not to scale.
- Look for labels of the state name, individual particles, and spaces between particles. Arrows showing movement direction (vibration in solids, sliding in liquids, rapid motion in gases) strengthen the model but are not required for Proficient.
- When assessing the connection between particles and properties, listen for or read statements such as "Solids are hard because particles are packed tightly" or "Gases spread out because particles have lots of space and move fast." The student need not name attractive forces to reach Proficient; naming them moves work toward Exemplary.
- Inaccuracies in one area (for example, labelling) do not automatically lower the particle model accuracy score. Score each criterion independently based on what the student demonstrates in that area.