

Rubric: Particle Model of Matter

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](#)). The rubric assesses:

- Representation of solids, liquids, and gases using the particle model of matter ([Skills](#))
- Relating the movement and arrangement of particles to the state of matter ([Skills](#))
- Describing the impact that attractive forces have on the movement and arrangement of particles ([Skills](#))
- Understanding that the particle model of matter explains the behaviour of particles in matter ([Understanding](#))

Rubric

Criterion	Beginning	Developing	Proficient	Exemplary
Representation of particles in states of matter	Shows particles in only one state or with significant errors in arrangement or spacing.	Shows particles in two states with mostly correct arrangement; one state has errors.	Shows particles in all three states with correct spacing and arrangement for each state.	Clearly shows particles in all three states with precise spacing, arrangement, and visual distinction between states.
Movement and arrangement	Describes particle movement or arrangement but not both; descriptions are unclear or incomplete.	Describes both movement and arrangement for most states; one description lacks clarity or accuracy.	Describes how particles move and arrange differently in solids, liquids, and gases with accuracy.	Explains movement and arrangement with clear connections to how each state behaves; uses precise language.
Attractive forces between particles	Does not address attractive forces or describes them incorrectly.	Mentions attractive forces but with limited or partial accuracy; connection to state of matter is unclear.	Describes how attractive forces are strongest in solids and weakest in gases; relates to particle arrangement.	Explains how attractive force strength determines particle spacing and movement; connects to physical properties.
Clarity and labelling	Model or report is difficult to understand; labels are missing or unclear.	Model or report is mostly clear; most labels are present and accurate.	Model or report is clear and well-organized; all key parts are labelled accurately.	Model or report is exceptionally clear and organized; labels are precise and enhance understanding.

Scoring

Assign each criterion a level: Beginning (1), Developing (2), Proficient (3), or Exemplary (4). Add the four scores. A total of 12 to 13 indicates developing understanding; 14 to 15 indicates proficient

understanding; 16 indicates exemplary understanding.

Notes for the teacher

- When assessing representation, look for accurate spacing between particles. In solids, particles should be close together; in liquids, separated by visible spaces; in gases, separated by large spaces.
- For movement and arrangement, check that students distinguish between vibrating in place (solids), sliding past each other (liquids), and moving in all directions (gases).
- Attractive forces can be shown through visual density or explicitly labelled. Accept either approach if the connection to particle spacing is clear.
- Accept models (drawings, diagrams, physical models) or written reports. Both formats can meet all four criteria equally well.