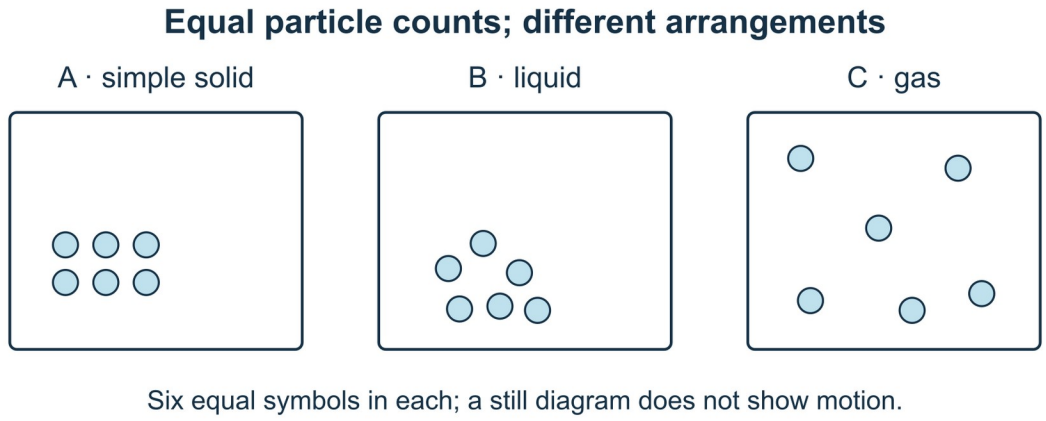
Three particle pictures

How can symbols explain states of matter while showing a model's limits?

Use equal-count dot pictures to discuss arrangement and motion in three simple states-of-matter models.

Explore | 10-20 minutes, or one model comparison | The supplied example, read or heard, Optional scrap paper and a pen or pencil

Start here Each supplied box contains six identical particle symbols. Solid A keeps them close in a regular cluster; liquid B close but irregular; gas C spread through the box.



Same six symbols, different arrangements

1 Count before interpreting

Check that all three pictures contain six dots of the same size. The dots stand for particles; changing the drawing's arrangement does not create extra particles.

2 Describe the arrangement

Compare regular and irregular close arrangements with widely separated positions. Describe what the dots show, rather than treating the empty paper as a different substance.

3 Add the motion the picture omits

In this simple description, solid particles vibrate around positions, liquid particles move past neighbours, and gas particles move around through the available space. A still drawing does not show that motion directly.

4 Label a model limit

Write 'symbols, not a magnified photograph'. These pictures select arrangement and motion ideas, leaving detailed particle shape, forces and scale out.

Original model six symbols in every state

The three schematic pictures are constructed examples of a simple solid, liquid and gas description; no substance is handled.

• A: six close symbols in a regular arrangement; vibration is described, not shown as stillness.

• B: six close symbols arranged irregularly; neighbours can change.

• C: six symbols separated across a larger occupied region; the particles themselves have not grown.

What this example can show Not all solids have a regular structure. Dot spacing is schematic and does not by itself supply measured density, temperature or speed.

A different way

Point to close and separated arrangements or have the models described aloud. You can complete the comparison without drawing or using any substances.

If you want to go further

Redraw one box with motion arrows, explaining what each arrow means. Do not change particle size to represent heating.

Something to notice

Did I mistake a still symbol for a particle that never moves?

Read or explore more

Horizon topic States Matter

https://launchhorizonhq.com/learn/states-matter/

Horizon topic Density Models

https://launchhorizonhq.com/learn/density-models/

Horizon topic Chemistry

https://launchhorizonhq.com/learn/chemistry/

OpenStax, Rice University 1.2 Phases and Classification of Matter

https://openstax.org/books/chemistry-2e/pages/1-2-phases-and-classification-of-matter

OpenStax, Rice University 10.3 Phase Transitions

https://openstax.org/books/chemistry-2e/pages/10-3-phase-transitions