
## Teaching notes

## How to use this resource

This resource, *Laptop wrap: Particle model*, is designed to support student use of laptops in both online and offline classroom environments.

The purpose of this resource is to reinforce students’ understanding of the particle model of matter by engaging them with interactive resources. The tasks aim to develop their understanding and provide some scope for extension in task three.

### Explore

The first link in the *Explore* section, <http://www.chem4kids.com/files/matter_intro.html>, provides an introduction to solids, liquids and gases. It mentions other states of matter, and students have the opportunity to research those later if they complete their tasks. The second link explains the particle model in very simple terms and uses animated diagrams. The [PhET interactive](https://phet.colorado.edu/sims/html/states-of-matter-basics/latest/states-of-matter-basics_en.html), develops student understanding by investigating particle movement in different substances and under different conditions. The quiz provides an easy way for students to test their understanding.

### Your tasks

#### Task one: Particle model of matter

Students view the linked webpage and watch the embedded slideshow, then create a flyer explaining the position and movements of particles in each state of matter. They then design an activity that could be used to explain this model.

#### Task two: Shape, position and movement

Students consider the objects they might come across at a birthday or barbecue*,* and create a table in Microsoft OneNote describing the shape, position and movement of particles in the different substances. An example for the table is given.

#### Task three: Extension

This task provides resources to extend student knowledge of the particle model by introducing elements, compounds and mixtures.

Students then consider substances that resist easy classification into a state of matter. They demonstrate their understanding of the particle model by explaining their reasoning in answering the questions about each substance that they choose.

### Quality teaching framework

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| ***Intellectual quality*** | ***Quality Learning Environment*** | ***Significance*** |
| 1.1 | Deep knowledge | **[ ]**  | 2.1 | Explicit quality criteria | **[ ]**  | 3.1 | Background knowledge | **[ ]**  |
| 1.2 | Deep understanding | **[ ]**  | 2.2 | Engagement | **[x]**  | 3.2 | Cultural knowledge | **[ ]**  |
| 1.3 | Problematic knowledge | **[ ]**  | 2.3 | High expectations | **[ ]**  | 3.3 | Knowledge integration | **[ ]**  |
| 1.4 | Higher-order thinking | **[ ]**  | 2.4 | Social support | **[ ]**  | 3.4 | Inclusivity | **[ ]**  |
| 1.5 | Metalanguage | **[x]**  | 2.5 | Students’ self-regulation | **[x]**  | 3.5 | Connectedness | **[ ]**  |
| 1.6 | Substantive communication | **[ ]**  | 2.6 | Student direction | **[ ]**  | 3.6 | Narrative | **[ ]**  |