Year 7 Matter – The Partical Model

Name of unit

Expected Outcomes

- Students will understand that all matter is made up of particles.
- Students will describe the arrangement, movement, and energy of particles in solids, liquids, and gases.
- Students will use particle diagrams to represent different states of matter.
- Students will explain changes of state in terms of particle movement and energy transfer.
- Students will understand how temperature affects particle motion.

Developmental Focus Opportunities

- **Model-based thinking**: Using abstract models to describe real-world substances.
- **Scientific communication**: Drawing and interpreting particle diagrams.
- **Practical science**: Observing changes of state and discussing what is happening at the particle level.
- **Critical reasoning**: Explaining phenomena like diffusion or expansion using particle theory.

Key Learning Points	**Powerful Knowledge**
• The particle model explains the behaviour of solids, liquids, and gases. • Particles in different states have different arrangements, movement, and energy. • Heating or cooling a substance changes the energy of its particles. • Changes of state are physical changes and do not change the particles themselves.	• Understanding how matter behaves at a microscopic level helps explain large-scale changes. • Recognising the limitations of models and how they are used in science. • Applying the particle model to everyday examples such as boiling, melting, and diffusion. • Building a strong conceptual foundation for chemistry and physics topics in later years.
Subject-Specific Vocabulary	**Reading Opportunities**
• Particle • Solid • Liquid	• Explanatory texts on particle theory and its real-life applications. • Diagrams and annotated models showing states of matter and changes of state.

Year 7 Matter – The Partical Model

• Gas • State of matter • Energy • Diffusion • Change of state	• Science articles about gases in the atmosphere or materials that change state (e.g. wax, water, dry ice).
Possible Misconceptions	**Cross-Curricular Links**
• Believing that particles change shape or size during changes of state. • Thinking that there are “gaps” or air between particles in a solid. • Confusing the terms heat and temperature. • Believing that diffusion only happens in gases.	• Maths: Temperature scales, graphing temperature changes. • Geography: The water cycle and states of matter in nature. • Art: Drawing accurate and scaled particle diagrams.