Chapter 1 – States of Matter

Chapter 1 – Lesson 1.1 – Everything is Made of Particles – Slide Set

Chapter 1 – Lesson 1.1 – Slide 1
Slide Title: Everything is Made of Particles
* All matter is made up of tiny particles too small to see.
* These particles are constantly moving.
* In solids, particles are closely packed and vibrate in place.
* In liquids and gases, particles move more freely.
* This movement leads to the mixing of particles, called diffusion.

Suggested Visual: A diagram showing particles in a solid, liquid, and gas, with arrows indicatin

Think Prompt: Can you think of everyday examples where you can see evidence of particles moving?

Chapter 1 – Lesson 1.1 – Slide 2
Slide Title: Evidence for Particles: Diffusion
* Diffusion is the mixing of particles due to their random motion.
* Examples include the spread of smells (cooking, perfume).
* Another example is the movement of dust and smoke particles in sunlight (Brownian motion).
* The spreading of color when potassium manganate(VII) dissolves in water is another example.
* Diffusion happens because particles move from high concentration areas to low concentration areas

Suggested Visual: A series of diagrams showing the diffusion of bromine gas into air, starting w

Think Prompt: How does the concept of diffusion explain why you can smell freshly cut grass fro

Chapter 1 – Lesson 1.1 – Slide 3
Slide Title: Types of Particles
* **Atoms:** The smallest particles that cannot be broken down chemically. Some substances, like Ar
* **Molecules:** Two or more atoms joined together. Examples include water (H■O), oxygen (O■), and
* **Ions:** Atoms or groups of atoms with an electric charge. Potassium manganate (VII) is an examp

Suggested Visual: Simple diagrams of an atom, a water molecule (H■O), and a simple ion (e.g., N

Think Prompt: How are atoms, molecules, and ions different from each other?

Chapter 1 – Lesson 1.2 – Solids, Liquids, and Gases – Slide Set

Chapter 1 – Lesson 1.2 – Slide 1
Slide Title: States of Matter: Solids
* Solids have a fixed shape and volume.
* Particles in a solid are tightly packed and vibrate in fixed positions.

* Solids do not flow easily.

Suggested Visual: A diagram of a tightly packed arrangement of particles vibrating in place. Ex

Think Prompt: Why do solids maintain their shape and volume?

Chapter 1 – Lesson 1.2 – Slide 2
Slide Title: States of Matter: Liquids
* Liquids have a fixed volume but take the shape of their container.
* Particles in a liquid are loosely packed and move around each other.
* Liquids flow easily.

Suggested Visual: A diagram showing loosely packed particles moving and sliding past one another

Think Prompt: Explain why liquids can flow but solids cannot.

Chapter 1 – Lesson 1.2 – Slide 3
Slide Title: States of Matter: Gases
* Gases have no fixed shape or volume.
* Particles in a gas are far apart and move randomly.
* Gases fill their containers completely.

Suggested Visual: A diagram showing widely spaced particles moving rapidly in all directions. E

Think Prompt: Why are gases easily compressible?

Chapter 1 – Lesson 1.2 – Slide 4
Slide Title: Changes of State
* **Melting:** Solid to liquid (e.g., ice melting to water).
* **Boiling/Evaporation:** Liquid to gas (e.g., water boiling to steam).
* **Freezing:** Liquid to solid (e.g., water freezing to ice).
* **Condensation:** Gas to liquid (e.g., steam condensing to water).

Suggested Visual: A diagram illustrating the different changes of state, using arrows to show th

Think Prompt: What are the conditions required for each change of state?

Chapter 1 – Lesson 1.2 – Slide 5
Slide Title: Heating Curve for Water
* A heating curve shows how the temperature changes during heating.
* The temperature remains constant during melting and boiling.
* Melting point of water is 0°C.
* Boiling point of water is 100°C.

Suggested Visual: A graph showing a heating curve for water, with labeled sections indicating wa

Think Prompt: Why does the temperature stay constant during melting and boiling?

(Continue with Lesson 1.3 and subsequent lessons following the same format.)