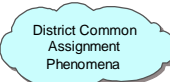


8th Grade Q1 Conceptual Flow

Main Idea: A substance's behavior (state of matter) is determined by what type of atom it is composed of and how much Thermal Energy is has.

Key:




District Common Assignment Phenomena

Goal 1: Learning science by investigating phenomena

Science and Engineering Practices from Performance Expectations

Disciplinary Core Ideas from Performance Expectations

Cross Cutting Concepts from Performance Expectations



New Equipment

Goal 3: Utilize supplementary equipment to transition into NGSS.

Goal 2: 3 Dimensional Instruction: Students learn DCI by doing practices and utilizing cross-cutting concepts (ways of thinking)

Big Idea 1: Matter is made up of small particles called atoms that can behave in different ways.

Analyze and Interpret Data

PS1.A

Pure substances are made of one type of atom or molecule.

Model

All atoms and molecules move in ways we cannot see.

Patterns

Analyze and Interpret Data

The temperature that melting or freezing occurs at for any pure substance can be predicted (Physical Property).

PS1.A

Patterns

Model

Molecules are groups of atoms that are held together by chemical potential energy.

PS3.A

Proportions

Sometimes molecules can be simple, sometimes they are extended and repetitious.

Cause (Movement) and Effect (State a substance behaves as)

When a substance is behaving as a solid, its atoms/molecules are vibrating in place beside each other, unable to move position and therefore, hold a specific shape.

When a substance is behaving as a liquid, its atoms/molecules are sliding past each other and therefore, flow to fill the substances container from the bottom up.

When a substance is behaving as a gas, its particles are moving very fast, colliding with each other, and the walls of their container, therefore the substance fills its container uniformly given enough time.

Model

If a substance acting as a liquid gains enough thermal energy, its particles might be able to overcome their mutual attraction and behave like a gas (Evaporation).

If a substance acting as a gas loses enough thermal energy, its particles might not be able to overcome their mutual attraction and behave like a liquid (Condensation).

Cause (thermal energy) and Effect motion of particles, therefore state.)

Water left out in a cup dries up sometimes leaving a ring.

Analyze and Interpret Data

The temperature that evaporation and condensation occurs at for any pure substance can be predicted (Physical Property).

PS1.A

Patterns

Model

Salt and Water Magnetic Models

Distillation apparatus with salt water.

Students can model evaporation and condensation of water in the distillation apparatus while simultaneously modeling that salt does not due to a difference in physical properties (mutual attraction)

PS3.A

The relationship between temperature and energy of a system depends on (types of matter, amounts of matter, and state of matter.)

Systems and system thinking.

Big Idea 3: When different substances interact, they can sometimes change into entirely different substances with difference properties.

Analyze and Interpret Data

Compounds can be identified by their properties.

PS1.B

Patterns

When compounds interact (reactants), sometimes their atoms can rearrange and form new compounds (Products) with different properties.

Model

Quantity (Examples that are inherently balanced). Unbalanced is Q2.

Analyze and Interpret Data

You can tell if a chemical reaction has occurred if the properties of the reactants are different from the properties of the products.

PS1.B

Patterns