Pequea Valley School District
Science

Unit:Scientific Method and Inquiry **Course: Physical Science** **Grade: 6**

Planning the Focus Based on the Desired Result
What do you want all students to know, understand and do by the end of the unit?

Unit Essential Question(s)
How can we use scientific experiments and observations to make sense of our world?

Keystone Eligible Content/PA Core Standard
S6.A.1.1.1: Explain how certain questions can be answered through scientific inquiry and/or technological design
S6.A.1.1.2: Use evidence to support inferences and claims about an investigation or relationship
S6.A.1.1.3: Predict the outcome of an experiment based on previously collected data.
S6.A.1.2.1: Use evidence, observations, or explanations to make inferences about changes in systems over time.
S6.A.1.2.2: Identify variables that cause changes in natural or human-made systems.
S8.A.2.1.3: Design a controlled experiment by specifying how the independent variables will be manipulated, how the dependent variable will be measured, and which variables will be held constant.

Pacing: Approximate number of class sessions per unit
- 5 weeks

Tier 3 Vocabulary (Content specific vocabulary)
- Evidence
- Variables
- Hypothesis
- Predictions
- Conclusions

Know - What do students need to **know** in order to be able to do and understand? ***List concepts, such as facts, formulas, key vocabulary and knowledge "nuggets".***
- Know how to use five senses to make observations
- Know how to use inferences and predictions from ELA
- Know how to analyzing information
- Know how to follow procedures

- Know how to complete multi-step problems

Understand - What do students need to **understand**? What is the **big idea**? ***List broad concepts or "big ideas" in a statement of enduring understanding.***

- Scientific knowledge is acquired and continually revised based on data and scientific observations and experiments.

Learning Outcome - What do students need to be able to **accomplish** by the unit's end? ***List skills and competencies, NOT learning activities.***

- Determine how scientific experiments begin
- Identify factors in an experiment
- Identify the independent and dependent variables in an experiment
- Create testable questions
- Know the difference between testable questions and hypotheses
- Make inferences in experiments based on information
- Identify the differences between observations, inferences, and predictions
- Identify errors in experiments
- Compile data
- Classify data and information in organized way

Literature:

Software/Resources:

Pequea Valley School District
Science

Unit: Properties of Matter **Course: Physical Science** **Grade: 6**

Planning the Focus Based on the Desired Result
What do you want all students to know, understand and do by the end of the unit?

Unit Essential Question(s)
How do you identify characteristics of matter?

Keystone Eligible Content/PA Core Standard
S6.C.1.1.1: Describe how characteristic physical properties of matter can be used to distinguish one substance from another (e.g., boiling point, freezing/melting points).
S6.C.1.1.2: Explain that materials are characterized by having a specific amount of mass in each unit of volume (density).
S6.C.1.2.1: Describe how water changes from one state to another.
S6.C.1.2.2: Identify differences between chemical and physical changes of matter.
S7.C.1.1.1: Use characteristic physical or chemical properties of matter to distinguish one substance from another (e.g., density, freezing/melting points, solubility, ability to rust).
S7.C.1.1.2: Recognize that the atom is the basic building block for all matter.
S7.C.1.1.3: Explain the differences between elements, compounds, and mixtures.
S7.C.1.1.4: Describe the relationship between mass and volume as density.

Pacing: Approximate number of class sessions per unit
- 5 weeks

Tier 3 Vocabulary (Content specific vocabulary)
- Elements
- Compounds
- Atoms
- Electron
- Proton
- Neutron
- Nucleus
- Solute
- Solvent

Know - What do students need to **know** in order to be able to do and understand? ***List concepts, such as facts, formulas, key vocabulary and knowledge "nuggets".***

- Know how to analyze data and make conclusions from interpretations
- Know how to examine models
- Know how to observe and define characteristics
- Know how to communicate scientific information

Understand - What do students need to **understand**? What is the **big idea**? ***List broad concepts or "big ideas" in a statement of enduring understanding.***

- Matter can be described by its physical and chemical properties.

Learning Outcome - What do students need to be able to **accomplish** by the unit's end? ***List skills and competencies.***

- Identify the phases of matter
- Describe and apply the properties of liquids
- Describe and apply the properties of gases
- Describe and apply how matter changes from one phase to another
- Describe and apply properties of solid matter
- Identify how density of an object can affect its properties
- Identify changes in matter as being physical or chemical
- Size of atom and the parts of an atom
- Basics of a chemical formula
- Identify types of mixtures
- Identify the differences between an element, a compound, and a mixture

Literature:

Software/Resources:

Pequea Valley School District
Science

Unit: Forces and Motion **Course: Physical Science** **Grade: 6**

Planning the Focus Based on the Desired Result
What do you want all students to know, understand and do by the end of the unit?

Unit Essential Question(s)
What is the connection between force and motion?

Keystone Eligible Content/PA Core Standard
S6.C.3.1.1: Compare speed and velocity.
S6.C.3.1.2: Explain why gravitational force depends on how much mass the objects have and the distance between them.
S7.C.3.1.1: Describe how unbalanced forces acting on an object change its velocity.
S7.C.3.1.2: Describe forces acting on an object (e.g., friction, gravity, balanced versus unbalanced).

Pacing: Approximate number of class sessions per unit
- 5-7 weeks

Tier 3 Vocabulary (Content specific vocabulary)
- Velocity
- Mass
- Friction
- Gravity

Know - What do students need to **know** in order to be able to do and understand? ***List concepts, such as facts, formulas, key vocabulary and knowledge "nuggets".***
- Know how to calculate speed and velocity
- Know how to use calculations to make informed decisions
- Know how to make observations
- Know how to communicate findings

Understand - What do students need to **understand**? What is the **big idea**? ***List broad concepts or "big ideas" in a statement of enduring understanding.***

- Forces are the origin of motion. These forces can be measured and calculated to describe the motion of objects.

Learning Outcome - What do students need to be able to **accomplish** by the unit's end? ***List skills and competencies, NOT learning activities.***

- How Newton's laws explain the principles of force and motion
- How to calculate forces
- How unbalanced and balanced forces affect motion
- What friction does to an object/motion
- Difference between mass and weight
- Calculate speed and velocity
- Difference between speed and velocity
- Calculate acceleration

Literature:

Software/Resources: