

**Academic content standard(s):**

Physical and chemical properties reflect the nature of the interactions between molecules or atoms, and can be used to classify and describe matter

- 1.1 Identify and explain physical properties (e.g., density, melting point, boiling point, conductivity, malleability) and chemical properties (e.g., the ability to form new substances). Distinguish between chemical and physical changes.
- 1.2 Explain the difference between pure substances (elements and compounds) and mixtures. Differentiate between heterogeneous and homogeneous mixtures.
- 1.3 Describe the three normal states of matter (solid, liquid, gas) in terms of energy, particle motion, and phase transitions.

**Make observations, raise questions, and formulate hypotheses.**

- Observe the world from a scientific perspective
- Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge

**Big Idea**

Materials exist throughout our physical world. The structures of materials influence their physical properties, chemical reactivity and use.

There are several ways in which elements and compound react to form new substances and each reaction involves the flow of energy.

**Learning Goals**

**Students will:**

- Understand how the noble gases are grouped in the periodic table of elements
- Understand the shared characteristics of
- Group 18 periodic table elements
- Understand the role of electrical current and vacuum tube to create colored light from noble gases

**Success Criteria**

**I can:**

- Identify the 6 noble gases on the periodic table of the elements and describe two key characteristics of this group
- Are able to describe how different colors are produced by noble gases
- Hypothesize how adding elements (mercury, phosphor) to noble gases might change the color they emit
- Design a neon sign and explain how it is made, identifying which noble gas produces each color

**Misconceptions students are likely to have about this topic:**

- Color is the property of an object rather than a reflection of light from the object
- The property of vacuums is to or pull things into them
- Particles can change form
- Gases are not matter



**Considerations for Diverse Learners**

If using feet, inches, yard, consider that it may be an ELL's first exposure to those units. A student may come from a system where decimals and commas are reversed in usage. Language proficiency levels are still vital to planning instruction in mathematics. Some ELLs arrive with math knowledge that far exceeds US age peers although they may not have enough English to adequately demonstrate that high level of mathematical understanding.

Success criteria is pretty black and white/concrete so this will be easier for many students.

Misconceptions or challenges: Students may not have been exposed to universal measurement