

## GA Standards – 1<sup>st</sup> Semester Physical Science

### Characteristics of Science

#### **SCSh2**

*You will understand lab safety and correctly use science equipment.*

#### **SCSh1**

*You will show the importance of using the following traits in your science courses: curiosity, openness and asking questions.*

#### **SCSh3**

*You will demonstrate how to investigate well and solve science problems. This involves developing well thought-out hypotheses and use correct steps and data in a science experiment.*

#### **SCSh4**

*You will use science equipment to produce tables and graphs, organize information and develop models.*

#### **SCSh5**

*You will show how measurements, tables, graphs are correctly used mathematically to analyze data and develop good scientific explanations.*

#### **SCSh6**

*You will write clear, logical reports and explanations that support and make clear your findings in your labs and research work.*

#### **SCSh7**

*You will analyze how broad areas of science knowledge have been developed in history and present.*

#### **SCSh8**

*You will understand the important characteristics used in science investigations.*

#### **SCSh9**

*You will read a variety of materials from different sources related to the science topics you are studying.*

### 1<sup>st</sup> Semester Physical Science Standards

#### SPS1: THE ATOM

Students will investigate our current understanding of the atom.

##### Elements

- a. Examine the structure of the atom in terms of
  - proton, electron, and neutron locations.
  - atomic mass and atomic number.
  - atoms with different numbers of neutrons (isotopes).
  - atoms with different numbers of protons.
- b. Compare and contrast ionic and covalent bonds in terms of electron position.

#### SPS2: CLASSIFICATION OF MATTER

Students will explore the nature of matter, its classifications, and the system for naming types of matter.

##### Elements

- a. Calculate density when given a means to determine a substance's mass and volume.

- b. Predict formulas for stable binary ionic compounds based on balance of charges.
- c. Use IUPAC nomenclature for transition between chemical names and chemical formulas of
  - binary ionic compounds (containing representative elements).
  - binary covalent compounds (i.e. carbon dioxide, carbon tetrachloride).
- d. Demonstrate the Law of Conservation of Matter in a chemical reaction.
- e. Apply the Law of Conservation of Matter by balancing the following types of chemical equations:
  - Synthesis
  - Decomposition
  - Single Replacement
  - Double Replacement

#### SPS4: PERIODIC TABLE

Students will investigate the arrangement of the Periodic Table.

##### Elements

- a. Determine the trends of the following:
  - Number of valence electrons
  - Types of ions formed by representative elements
  - Location of metals, nonmetals, and metalloids
  - Phases at room temperature
- b. Use the Periodic Table to predict the above properties for representative elements.

#### SPS3: RADIOACTIVITY

Students will distinguish the characteristics and components of radioactivity.

##### Elements

- a. Differentiate among alpha and beta particles and gamma radiation.
- b. Differentiate between fission and fusion.
- c. Explain the process half-life as related to radioactive decay.
- d. Describe nuclear energy, its practical application as an alternative energy source, and its potential problems.

# Physical Science

## Student Pacing Chart

Week	Mon.	Tue.	Wed.	Thurs.	Fri.
1	Unit 0	Unit 0	Unit 0	Unit 0	Unit 0
	Orientation; Rev. syllabus; Lab contract Pre-test	<i>Video: Lab safety</i> symbols <b>Lab/Activity 1:</b> Safety; Lab write-up	Processing Skills <b>Lab/Activity 2:</b> Bubble Gum Lab	<b>Quiz #1:</b> Rules & Equipment;	<b>Lab/Activity 4:</b> Using SI Measurements in Experiments
2	Unit 0	Unit 0	Unit 0	Unit 1	Unit 1
	Writing a Lab Report	Review, Re-teach, Enrichment	<b>Unit 0</b> <b>Assessment 1</b>	Introduce The Properties of Atoms <b>Lab/Activity 6:</b> The Atom	Introduce nucleus-proton, electron, neutron
3	Unit 1	Unit 1	Unit 1	Unit 1	Unit 1
	<b>Lab/Activity 7:</b> Visualizing the Atomic Model	Introduce Atomic Number and Atomic Mass	Making an atom <b>Project 1</b> <i>(due in 1 week)</i>	Introduce Isotopes and Half Lives	Introduce the Periodic Table
4	Unit 1	Unit 1	Unit 1	Unit 1	Unit 1
	<b>Lab/Activity 8:</b> Make your own periodic table	Regions on the periodic table	<b>Lab/Activity 9:</b> What's in a Name?	Review, Re-teach, Enrichment	<b>Unit 1</b> <b>Assessment 2</b>
5	Unit 2	Unit 2	Unit 2	Unit 2	Unit 2
	Introduce Classification of Matter	<b>Lab/Activity 10:</b> How are cards and periodic table connected?	Matter classification reading worksheets	<b>Lab/Activity 11:</b> Composition of matter <i>(due in 1 week)</i>	<b>Lab/Activity 11</b> <b>cont</b> Composition of Matter <i>(due in 1 week)</i>
6	Unit 2	Unit 2	Unit 2	Unit 2	Unit 2
	<b>Lab/Activity 12:</b> Pure Substances vs. Mixtures	Elements, compounds and mixtures	Introduce Physical and Chemical Properties	Physical and chemical properties worksheets	<b>Lab/Activity 14:</b> Detecting a Chemical Change
7	Unit 2	Unit 2	Unit 2	Unit 2	Unit 2
	<b>Lab/Activity 15:</b> The Conservation of Mass	<b>Lab/Activity 15:</b> Acids and Bases	<b>Lab/Activity 16:</b> Intriguing Elements	<b>Lab/Activity 17:</b> Preparation of Carbon Dioxide	Metals versus Nonmetals on PT
8	Unit 2	Unit 2	Unit 2	Unit 2	Unit 2
	<b>Lab/Activity 18:</b> Metal or Not?	<b>Lab/Activity 19</b> Slippery Carbon	<b>Lab/Activity 19</b> <b>Cont</b> Slippery Carbon	<b>Project 4</b> Analyzing the Effect of Metals on Humans <i>(due in 1 week)</i>	<b>Project 4</b> Analyzing the Effect of Metals on Humans <i>(due in 1 week)</i>

<b>9</b>	<b>Unit 2</b>	<b>Unit 2</b>	<b>Unit 3</b>	<b>Unit 3</b>	<b>Unit 3</b>
	Review, Re-teach, Enrichment	<b>Unit 2 Assessment 3</b>	Introduce Radioactivity	Alpha, Beta and Gamma rays reading worksheets	<b>Lab/Activity 20:</b> Modeling the strong force
<b>10</b>	<b>Unit 3</b>	<b>Unit 3</b>	<b>Unit 3</b>	<b>Unit 3</b>	<b>Unit 3</b>
	<b>Lab/Activity 21:</b> Modeling a Nuclear Reaction	Introduce different types of ions	Nuclear fission and Nuclear fusion	<b>Project 5</b> The Effect of Radiation on Seeds <i>(due in 1 week)</i>	<b>Lab/Activity 22</b> Modeling Transmutation
<b>11</b>	<b>Unit 3</b>	<b>Unit 3</b>	<b>Unit 3</b>	<b>Unit 3</b>	<b>Unit 3</b>
	<b>Lab/Activity 23:</b> Radioactive Decay	<b>Lab/Activity 24:</b> Fission or Fusion possibilities	<b>Lab/Activity 25:</b> Nuclear Decay	Project 5 Presentations	Video Radiation Around Us
<b>12</b>	<b>Unit 3</b>	<b>Unit 3</b>	<b>Unit 3</b>	<b>Unit 3</b>	<b>Unit 3</b>
	<b>Lab/Activity 26:</b> The Decay of U- 235	Review, Re-teach, Enrichment	<b>Unit 3 Assessment 4</b>	<b>Comprehensive Review</b>	<b>Final Exam</b>

*The daily schedule may vary throughout the semester due to school-related functions.*

*It is the teacher's discretion to adjust the schedule as needed.*

***At the beginning of each class period, expect a short sponge activity and/or various journal entry assignments.***

***All Assignments are due the day they are given except projects. All projects are due 1 week after the assigned date.***

***Assignments turned in late will receive the following grade penalties:***

**1 day late - 90% of total grade**

**2 days late – 85% of total grade**

**3-5 days late - 80% of total grade**

**1-2 weeks late - 75% of total grade**

**More than 2 weeks late – 70% of total grade**

## Essential Questions for Physical Science 1<sup>st</sup> Semester

1. How do we know what the atom looks like when no one has ever seen it?
2. To what extent has nuclear energy impacted your life?
3. What secrets can be revealed in the periodic table?
4. When buying jewelry made from gold, how would you be able to determine if you were purchasing pure gold or fool's gold?
5. Why in nature are there more atoms in a combined state than individual atoms?
6. What happens at the subatomic level when two atoms form a chemical bond?
7. Why do atoms form different types of bonds?
8. Why should atoms or ions combine in proportionate amounts?
9. What would happen if each scientist had their own way to name and write formulas?
10. How can you explain that your family is made of star dust?
11. Why are there different laws that govern gases and not solids and liquids?
12. To what extent does atomic and molecular motion aid in the substance?
13. What does Gatorade have to do with the solutions in our body?
14. Why is it necessary to read cleaning labels prior to mixing solutions?
15. How often are acids and bases used in daily activities?