5th Grade Science

The purpose of this document is to clarify what students should know and be able to do each quarter (Q).

Competencies	Q 1	Q 2	Q 3	Q 4
C1 – Uses data for Scientific Explanations The student analyzes and interprets information and is able to construct reasonable explanations from observed and inferred evidence.	X	X	X	X
C2 - Physical Properties of Matter and Mixtures The student classifies matter based on physical properties, and identifies whether or not the physical properties of ingredients in mixtures change.	X			
C3 – Force and Energy The student explores the uses of energy, and designs an experimental investigation that tests the effects of forces on objects.	X	X		
C4 – Changes on Earth's Surface The student describes how wind, water and ice cause slow changes on Earth's surface.		X		
C5 – Formation of Sedimentary Rocks The student explores how sedimentary rocks and fossil fuels are formed.		X		
C6 – Water Cycle, Weather and Climate The student explains water cycle interactions and differentiates between weather and climate.			X	
C7 – Earth's Cycles The student demonstrates the effects of Earth's rotation.			X	
C8 – Interaction with ecosystems and changes in ecosystems The student observes the interactions and predicts changes within ecosystems.				X
C9 – Structures and Functions of organisms The student compares the structures and functions of organisms and differentiates between inherited traits and learned behaviors.				X

Learning Progression for Competency 1: Uses data for Scientific Explanations

The student analyzes and interprets information and is able to construct reasonable explanations from observed and inferred evidence.

Developing	Progressing	Proficient	Advanced
Interprets data and patterns to construct some explanations that can be observed or measured Makes an inaccurate claim Evidence is inappropriate or does not support the claim May attempt to connect the claim and evidence using a scientific concept, but the concept is not relevant	Interprets data and patterns to construct reasonable explanations that can be observed and measured Makes an accurate but vague or incomplete claim in writing **or** orally Uses some specific data (exact words and/or numbers) as evidence to support the claim Connects the claim and evidence using only relevant scientific concepts Create reasoning by connecting some of the claim and evidence to explain a scientific concept	Analyzes and interprets information and is able to construct reasonable explanations from observed and inferred evidence Makes an accurate and complete claim that answers the question, in writing and orally Uses enough evidence to support the claim based on data Uses only relevant specific data (exact words and/or numbers) as evidence to support the claim Connects the claim and evidence using only relevant scientific concepts Explains why the evidence supports the claim Creates reasoning by connecting the claim and evidence to explain a scientific concept	Analyzes data to formulate reasonable explanations, communicates valid conclusions supported by the data, and predicts trends Recognizes alternative explanations and provides appropriate counterevidence. Communicates valid conclusions in both written and verbal forms, using academic language.

Success Criteria for Proficient in Scientific Explanations:

The student can:

- make an accurate claim based on data.
- identify pieces of evidence that support the claim.
- create reasoning by connecting the claim and evidence to explain a scientific concept.
- provide feedback to peers about their claim, evidence, and reasoning.

Learning Progression for Competency 2: Physical Properties of Matter and Mixtures

The student classifies matter based on physical properties, and identifies whether or not the physical properties of ingredients in mixtures change.

Developing	Progressing	Proficient	Advanced
Compares matter based on physical state, mass, magnetism, relative density, ability to conduct or insulate electrical energy, thermal energy, and solubility Compares the physical properties of the ingredients of a variety of mixtures and solutions Demonstrates how to separate mixtures and solutions	Classifies matter using appropriate scientific tools Classifies matter based on some physical properties Reads charts, tables, or graphs showing how matter has been classified Identifies mixtures and solutions Demonstrates that mixtures maintain the physical properties of the ingredients Explains how to separate mixtures and solutions based on the physical properties of the ingredients	Identifies how matter has been classified Classifies and justifies why items were grouped based on physical properties Analyzes data in charts, tables, and graphs to determine how matter has been classified Identifies the physical properties that change in the ingredients of solutions Selects the most appropriate process to separate mixtures and solutions	Designs an investigation to test properties of matter ○ how state of matter effects volume ○ How water changes into different states of matter ○ the strength of magnets ○ how the shape of materials affects their relative density ○ for conductors and insulators of thermal energy ○ the solubility of items in a solvent other than water Predicts and tests different combinations of liquids, solids, and gases to create mixtures and solutions Proposes a solution to solve real-world problems that require separating mixtures (e.g. oil spill)

Success Criteria for Proficient in Matter:

The student can:

- identify how matter has been classified.
- classify matter and justify why items were grouped.

- physical state
- mass
- magnetism
- relative density
- ability to conduct or insulate electrical energy and thermal energy
- solubility

- analyze data to determine how matter has been classified.
  - charts
  - tables
  - graphs
- identify the physical properties that change in the ingredients of solutions.
  - dissolving
  - taste
  - color
  - odor
- select the most appropriate process to separate mixtures and solutions.
  - dissolving
  - straining
  - evaporating
  - filter

Learning Progression for Competency 3: Force and Energy

The student explores the uses of energy, and designs an experimental investigation that tests the effects of forces on objects.

Developing	Progressing	Proficient	Advanced
Differentiates among the forms of energy, including mechanical, sound, electrical, light, and thermal Provides examples of objects that use or produce light energy Demonstrates that electricity flows in a closed path, creating an electrical circuit Explains the effects that forces such as push and pull, gravity, friction, and magnetism, have on objects After a being provided with a description of what is being investigated, discusses an experimental investigation with peers that can test what is planned After being provided with a description of a well-designed investigation, with peers, discusses what is being investigated	Describes the uses of energy with everyday objects, including mechanical, sound, electrical, light, and thermal Demonstrates and explains that light energy travels in a straight line Explains how light behaves differently when it strikes opaque, translucent, and transparent objects After being provided with a description of what is being investigated, designs an experimental investigation with peers that can test what is planned After being provided with a description of a well-designed investigation, with peers, determines what is being investigated	Manipulates, explores, and provides examples of objects that use different forms of energy Demonstrates, predicts and explains how light behaves Demonstrates how the flow of electricity in closed circuits can produce light, heat, or sound After a being provided with a description of what is being investigated, designs an experimental investigation that can test what is planned After being provided with a description of a well-designed investigation, determines what is being investigated	Constructs models to demonstrate how light energy can be reflected or refracted Constructs models to to mimic everyday objects that use electricity to produce light, heat, or sound Designs and conducts investigations to demonstrate the effects that unbalanced forces have on the position and direction of objects. Draws conclusions based on data and/or diagrams showing movement of an object over time

Success Criteria for Proficient in Force and Energy:

The student can:

- manipulate, explore, and provide examples of objects that use different forms of energy.
  - mechanical energy
  - light energy
  - thermal energy
  - electrical energy
  - sound energy
- demonstrate, predict, and explain how light behaves.
  - when it strikes an object and is reflected light
  - when it travels through one medium to another and is refracted
- demonstrate how the flow of electricity in closed circuits can produce light, heat, or sound.
- after a being provided with a description of what is being investigated, designs an experimental investigation that can test what is planned.
- after being provided with a description of a well-designed investigation, determines what is being investigated.