# 4th 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 Scientific Explanations**<br>The student analyzes and interprets information and is able to construct reasonable explanations from evidence. | **X** | **X** | **X** | **X** |
| **C2 Matter**<br>The student measures and compares matter based on physical properties, and compares a variety of mixtures. | **X** | | | |
| **C3 Force, Motion, and Energy**<br>The student differentiates between forms of energy, and designs an investigation that tests the effects of forces on objects. | | **X** | | |
| **C4 Earth's Surface**<br>The student examines properties of soils and describes the effects of weathering, erosion, and deposition on Earth's surface. | | **X** | | |
| **C5 Patterns in the Natural World**<br>The student recognizes patterns in weather, the water cycle, and among the Sun, Earth, and Moon system. | | | **X** | |
| **C6 Organisms and Environments**<br>The student explores that living organisms within an ecosystem interact with one another and their environment and have structures and behaviors that help them survive. | | | | **X** |

**Learning Progression for Competency 1: Scientific Explanations**

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

| Developing | Progressing | Proficient | Advanced |
|---|---|---|---|
| Did not make a claim; or claim does not answer the question<br><br>Did not provide evidence; or evidence does not support the claim; or evidence does not include specific data (exact words or numbers) to support claim<br><br>Did not provide reasoning; or reasoning does not connect the claim to the evidence | Claim does not completely answer the question<br><br>Uses some evidence to support claim<br><br>Evidence includes specific data (exact words or numbers) to support claim<br><br>Attempts to explain how the claim is connected to the evidence using a scientific concept | Claim completely answers the question<br><br>Uses sufficient evidence to support claim<br><br>Evidence includes only relevant specific data (exact words or numbers) to support claim<br><br>Explains how the claim is connected to the evidence using a scientific concept | Claim completely answers the question<br><br>Uses sufficient evidence to support claim<br><br>Evidence includes only relevant specific data (exact words or numbers) to support claim<br><br>Explains how the claim is connected to the evidence using only relevant scientific concepts. |

**Success Criteria for Proficient in Scientific Explanation:**

**The student can:**

- answer a question by making a claim.
- use specific data as evidence to support the claim.
- attempt to state a scientific principle or scientific idea that justifies how evidence supports the claim.

**Learning Progression for Competency 2: Matter**

The student measures and compares matter based on physical properties, and compares a variety of mixtures.

| Developing | Progressing | Proficient | Advanced |
|---|---|---|---|
| Measures mass by using a primary balance and gram stackers<br><br>Records mass using the Metric System (kilograms, grams, milligrams)<br><br>Measures the volume of liquids by using graduated cylinders and beakers<br><br>Records volume using the Metric System [liter (L), milliliter (mL)]<br><br>Describes the physical characteristics of solids, liquids, and gases<br><br>Measures the temperature of matter by using a thermometer<br><br>Records temperature in Celsius (°C)<br><br>Tests items to determine if they are magnetic or nonmagnetic | Measures and compares mass by using a triple beam balance<br><br>Records mass using the Metric System (kilograms, grams, milligrams)<br><br>Measures and compares the volume of liquids by using graduated cylinders and beakers<br><br>Measures and compares the volume of solids by using the displacement method<br><br>Records volume using the Metric System [liter (L), milliliter (mL)]<br><br>Compares matter based on its physical state<br><br>Measures and compares the temperature of matter by using a thermometer<br><br>Records temperature in Celsius (°C) | Measures, compares, and contrasts physical properties of matter<br><br>Records properties of matter using the Metric System<br><br>Compares and contrasts physical properties of matter<br><br>Explains the physical properties of the ingredients in mixtures that are solutions change after the ingredients are combined. | Classifies matter based on mass by using a triple beam balance<br><br>Records mass using the Metric System (kilograms, grams, milligrams)<br><br>Classifies liquids based on volume by using a graduated cylinders and beakers<br><br>Classifies solids based on volume by using the displacement method<br><br>Records volume using the Metric System [liter (L), milliliter (mL)]<br><br>Classifies matter based on its physical state<br><br>Classifies matter based on temperature by using a thermometer<br><br>Records temperature in Celsius (°C) |

| | | | |
|---|---|---|---|
| Tests objects to determine if they sink or float<br><br>Describes matter based on the properties of mass, volume, state of matter, temperature, magnetism, and ability to sink and float<br><br>Differentiates between mixtures and non-mixtures by explaining that mixtures are created when two of more materials are combined | Compares matter based on magnetism<br>Compares matter based on its ability to sink or float<br><br>Compares matter based on the properties of mass, volume, state of matter, temperature, magnetism, and ability to sink and float<br><br>Compares mixtures by identifying that the ingredients in a mixture maintain or keep their physical properties after they are combined | | Classifies matter based on magnetism<br><br>Classifies matter based on its ability to sink or float<br><br>Classifies matter based on the properties of mass, volume, state of matter, temperature, magnetism, and ability to sink and float<br><br>Identifies changes that occur in the physical properties of the ingredients of mixtures that are solutions |

**Success Criteria for Proficient in Matter:**

**The student can:**

- measure, compare, and contrast physical properties of matter.
  - mass using a triple beam balance
  - volume of solids using graduated cylinders, beakers and the displacement method
  - temperature using a thermometer
- record properties of matter using the Metric System.
  - kilograms
  - grams
  - milligrams
  - liters
  - milliliters
  - celsius
- compare and contrast physical properties of matter.

- physical state
- magnetism
- sink
- float
- mixtures
- mixtures that are solutions

- explain the physical properties of the ingredients in mixtures that are solutions change after the ingredients are combined.

**Learning Progression for Competency 6: Organisms and Environments**

The student explores that living organisms within an ecosystem interact with one another and their environment and have structures and behaviors that help them survive.

| Developing | Progressing | Proficient | Advanced |
|---|---|---|---|
| Identifies what producers and consumers eat<br><br>Describes basic plant and animal structures and functions<br><br>Compares ways that organisms resemble their parents | Identifies producers are the only organisms that can make their own food, while consumers depend on other organisms for survival<br><br>Describes how structures and functions of plants and animals enable them to survive<br><br>Defines inherited trait and learned behavior | Examines the different ways producers and consumers get their energy<br><br>Identifies producers' needs to make their own food to get energy<br><br>Identifies consumers depend on others for energy<br><br>Describes how structures and functions enable organisms to survive in their environments<br><br>Describes examples of inherited traits and learned behaviors | Explains what any given organism is dependent upon to get energy and whether it is a consumer or producer and describe the interaction between the two.<br><br>Compares the structures and functions of different species of organisms and how they enable them to survive in their environments<br><br>Differentiates between inherited traits and learned behaviors |

**Success Criteria for Proficient in Organisms and Environments:**

**The student can:**

- examine the different ways producers and consumers get their energy.
- identify producers' needs to make their own food to get energy
    - sunlight
    - water
    - carbon dioxide
- identify consumers depend on others for energy.
    - producers

- other consumers
- describe how structures and functions enable organisms to survive in their environments.
- describe examples of inherited traits and learned behaviors.