

**Frenchtown School District**  
**5th Grade Science**  
**Curriculum**  
**Curriculum Review Dates: 4/13/2021**

**Description of Science Content Taught by Quarter:**  
**Quarter 1: Investigate Matter**

During the first quarter, the students will be reintroduced to the Scientific Process and investigating Matter. This learning module is one unit with four lessons, as well as a STEM Module Project. The main idea that the students will be investigating is, “What do we need to know about matter to use it to solve problems?”

During the first lesson, which will take approximately 7-10 days, the students will be learning about the properties of matter. They will observe and produce data to identify materials based on their properties. For struggling students, allow students to discuss what the properties of matter are, as well as how they are applied in real life. Additionally, allow for more opportunities for students to practice defining properties in tangible objects. For students who are above grade level, have students explain the “why” for a material's physical properties and allow for students to have a research project opportunity into the periodic table.

The second lesson the students will learn what happens when different materials are mixed together. The students will use mathematical and computational thinking to determine if mixing substances causes a change in mass. This lesson should take 7-9 days. For struggling students, have students compare the physical properties discussed before and after materials are mixed together as well as providing extra opportunities to practice using lesson vocabulary. For students who are above grade level, have students create a presentation of different kinds or mixtures with explanations of their physical properties.

The third lesson will also take place over a 7 day period and the students will be investigating how matter changes, or does not change, when it interacts with other matter. The students will plan and carry out investigations to determine if mass is conserved after matter undergoes a chemical or physical change. For struggling students, prompt students to answer what, where, when, why and how questions as well as additional opportunities to practice using lesson vocabulary in context. For students who are above level, have students describe the chemical changes they are seeing as well as performing their own chemical changes and report on them.

The final lesson of the unit will take place over a 7 day period. The students will be learning about the differences between solids, liquids, and gases. Students will use models to show the scale and organization of particles in matter. The students will investigate how the arrangement of particles affects the properties of matter. For struggling students, allow students to list new materials and how they can effect change as well as providing students with a graphic organizer to compare the states of matter. For students who are above grade level, allow students to research a material to determine what state of matter it is as well as asking “why” questions to expand their thinking.

After the final lesson the students will participate in a STEM Module. During the STEM Module for this unit, the students will define the criteria for and test how to make the perfect pancake. The students will use what they learned throughout the unit to explain how knowing about matter helps the students make the best pancake. For struggling students, allow students to work with peers who work well with others. For students who are above grade level, allow students to create an additional presentation.

For struggling students, allow students to list new materials and how they can effect change as well as providing students with a graphic organizer to compare the states of matter. Also, for struggling students, use the Google Extension “Screencast Reader” for any virtual materials that do not have built in reading extensions. For students who are above grade level, allow students to research a material to determine what state of matter it is as well as asking “why” questions to expand their thinking. Also, for students who are above grade level, allow multiple opportunities for research projects to expand their knowledge in the areas specified in the lessons.

Matter - NGSS (5-PS1-1) Lesson 1, Lesson 2, Lesson 4 and Stem Module Project  
NGSS (5-PS1-2) Lesson 1, Lesson 2, Lesson 3, Lesson 4, STEM Module  
NGSS (5-PS1-3) Lesson 1, Lesson 2, Lesson 3, Lesson 4, STEM Module  
NGSS (5-PS1-4) Lesson 1, Lesson 2, Lesson 3, Lesson 4, STEM Module  
NGSS (3-5-ETSI-3) Lesson 1, Lesson 3, STEM Module

**5- PS1-1. Develop a model to describe that matter is made of particles too small to be seen.**

[Clarification Statement: Examples of evidence supporting a model could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water.] [Assessment Boundary: Assessment does not include the atomic-scale mechanism of evaporation and condensation or defining the unseen particles.]

**5- PS1-2. Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.**

[Clarification Statement: Examples of reactions or changes could include phase changes, dissolving, and mixing that form new substances.] [Assessment Boundary: Assessment does not include distinguishing mass and weight.]

**5- PS1-3. Make observations and measurements to identify materials based on their properties.**

[Clarification Statement: Examples of materials to be identified could include baking soda and other powders, metals, minerals, and liquids. Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility; density is not intended as an identifiable property.] [Assessment Boundary: Assessment does not include density or distinguishing mass and weight.]

**5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.**

**3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.**

## **Quarter 2: Ecosystems**

During Quarter 2 the students will transition to learning about Life Sciences, and specifically about Ecosystems. This unit has two learning modules with 3 lessons and a STEM Module in each. In the first module, students will learn how to support an argument that plants get the materials they need for growth chiefly from air and water. They will also develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. The students will be able to discuss how matter cycles between the living and nonliving parts of an ecosystem. During the second learning module students will be learning about Energy in Ecosystems. The students will be learning about earth's major systems, cycles of matter in ecosystems, and energy transfer in ecosystems.

The first lesson of the first module will take approximately 8-10 days. The students will be learning about different types of matter in ecosystems and how the types of matter interact. The students will also be learning about what plants need in order to survive, as well as support an argument that most of the mass of a plant is obtained from water and air and not from the soil. For struggling students, prompt students with “why” based questions. For students who are above grade level, allow for deeper research into the topic of underwater plants.

During the second lesson of the unit, which should last about 7 days, the students will be investigating what happens when different materials are mixed together. The students will use models to show the relationships between living things in an ecosystem. For struggling students, have students define “system” on a deeper level and apply their knowledge to real world examples. For students who are above grade level, have students lead discussions and create reports on matter moving through the Earth and through humans.

The third and final lesson of the unit will also span about 7 class periods. The student will be learning the role of decomposers in the ecosystem. The students will be using models to understand the role of decomposers and their place in an ecosystem. For struggling students, allow students to work with a partner and complete as much hand-on work as possible. For students who are above grade level, allow for additional opportunities to dive deeper into the concept.

After the final lesson of the learning module, students will be participating in a STEM Module that will take course over approximately 3 days. The students will use what they have learned throughout the unit to work with a small group to design a compost heap that will recycle plant waste into usable compost. The students will revisit the module and discuss and explain the ways matter cycle within an ecosystem. For struggling students, allow as much hands-on work as possible to encourage project based learning. For students who are above grade level,

allow for additional learning opportunities or extension activities such as creating a presentation or additional readings on the current topic.

The first lesson of the second module will span approximately 6-7 class periods. The students will be learning about how energy from the sun is essential for life on Earth. The students will use models to understand how energy flows within an ecosystem. The students will use a model to identify matter on Earth as part of Earth's systems.

The second lesson will take course over 7 class periods. The students will be investigating the essential question, "How does matter cycle in ecosystems?" The students will develop and use models of how matter cycles through ecosystems. Students will also be able to explain how these cycles affect the ecosystem. Students will get to investigate not only the water cycle, but also the carbon-oxygen cycle and the nitrogen cycle.

The third and final lesson of the unit will take approximately 6-7 class periods. The students will be investigating how energy is transferred in an ecosystem. The students will develop and use models to show how energy is transferred through an ecosystem. The students will get to play "Ecosystem Tag", as well as research and model a food chain and web.

The STEM Module Project will take place over 3 class periods. The students will use what they've learned throughout the module to design an eco-column. The students will revisit the Module Phenomenon from earlier and explain that the Sun is the source of all energy in an ecosystem.

For struggling students, use the Google Extension "Screencast Reader" for any virtual materials that do not have built in reading extensions. For students who are above grade level, allow multiple opportunities for research projects to expand their knowledge in the areas specified in the lessons.

### **Matter in Ecosystems**

NGSS (5-LS1-1) Lesson 1, Lesson 2, Lesson 3, STEM Module  
NGSS (5-LS2-1) Lesson 1, Lesson 2, Lesson 3, STEM Module  
NGSS (5-ESS2-1) Lesson 1, Lesson 2, Lesson 3, STEM Module  
NGSS (5-PS3-1) Lesson 1, Lesson 2, Lesson 3, STEM Module

### **Energy in Ecosystems**

NGSS (5-LS2-1) Lesson 1, Lesson 2, Lesson 3, STEM Module  
NGSS (5-ESS2-1) Lesson 1, Lesson 2, Lesson 3, STEM Module  
NGSS (5-PS3-1) Lesson 1, Lesson 2, Lesson 3, STEM Module

- 5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water.** [Clarification Statement: Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil.]

- 5-LS2-1** **Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.** [Clarification Statement: Emphasis is on the idea that matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth.] [Assessment Boundary: Assessment does not include molecular explanations.]
- 5-ESS2-1** **Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.** [Clarification Statement: Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system.] [Assessment Boundary: Assessment is limited to the interactions of two systems at a time.]
- 5-PS1-3** **Make observations and measurements to identify materials based on their properties.** [Clarification Statement: Examples of materials to be identified could include baking soda and other powders, metals, minerals, and liquids. Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility; density is not intended as an identifiable property.] [Assessment Boundary: Assessment does not include density or distinguishing mass and weight.]

### Quarter 3: Earth's Interactive Systems

During the 3rd Quarter the students will be exploring Earth's Systems. At the end of the unit students will: develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere; describe and graph the amounts and percentages of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth; obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment; define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost; generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem; plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

The students will also be working on a Science Fair project. The Science Fair project will include a written portion in which students will be using the Scientific Method to explain their project, and they will be presenting their project to peers and community members.

For struggling students, the teacher will reteach students who are struggling how to use the resources available to them within the virtual components of the curriculum. This would include any accommodations built into the curriculum as well as any extensions being used such

as “Screenshot Reader” or other relevant applications. Allow students who struggle with comprehension to complete as many hands-on tasks as possible during the unit as well as work with peers. For specific accommodations (i.e. graphic organizers, etc.), communicate with the grade level Special Education teacher. For students who are above grade level, allow for opportunities to work independently and complete extension projects relevant to the current topic. This could be creating a presentation or completing an additional reading on the current lesson and objective.

The first lesson of the learning module will span 7-8 class periods. During the first lessons the students will be learning how we can collect water to conserve water and resources. The students will understand the effects humans have on Earth’s water sources as well as the location and amount of water on Earth’s surfaces. The students will also learn about the types of water features on Earth’s and use mathematics to graph the amounts of usable freshwater on Earth.

During the second lesson of the learning module, the students will be exploring the human impact on water resources. The lesson will span approximately 7 class periods. The objective for the lesson is that the students will explain the positive and negative impact that humans can have on water resources.

The third and final lesson of this module will also occur over 7 class periods. The students will be exploring the effects on the hydrosphere, and how the hydrosphere interacts with Earth’s other systems. The lesson objective will be that students will develop and use models to show how the hydrosphere interacts with Earth’s other systems. The students will be learning about models with river and wave erosion.

The first learning module of the unit wraps up with a 3 day STEM Module in which the students will design a rainwater collection system for a desert oasis. This will be an interactive presentation that they will work through and complete online. They will write about and share their findings with each other during the final day of the Module.

The second learning module of the unit has three lessons, as well as a STEM Module Project. The students will be learning about Earth’s other systems, such as the Geosphere, Atmosphere, and Biosphere.

The first lesson will span 8-9 class periods, and the students will be investigating how the geosphere interacts with other Earth systems. The students will develop and use models to show how the geosphere interacts with Earth's other systems. The students will be participating in two activities, in which they will be predicting the flow of water and studying the effects of soil on water pH.

The second lesson of the learning module will span approximately 7 class periods. During this time, the students will be studying how the atmosphere interacts with other systems. The students will develop and use models to show how the atmosphere interacts with Earth's other systems. In this lesson, the students will get to do a hands on activity with warm and cold

air masses, research on chances of extreme weather, and data analysis on Idaho's variable elevations.

The third and final lesson of the learning module will also span 7 class periods. The students will be studying how the biosphere interacts with other systems. The students will develop and use models to show how the biosphere interacts with Earth's other systems. In this lesson the students will do a simulation in which they investigate the effects of overfishing, they will complete a data analysis on endangered and extinct animals, and they will do research about how to protect against forest fires.

For the STEM Module Project, the students will work on their Desert Oasis that they designed after the first module. The students will work on their design in which the living things are able to get what they need to survive under the harsh conditions of a desert. The students will use what they learned throughout the module to explain how Earth's systems interact and affect ecosystems.

#### **Earth's Water Systems:**

NGSS (5-ESS2-1) Lesson 1, Lesson 2, Lesson 3, STEM Module

NGSS (5-ESS2-2) Lesson 1, Lesson 2, STEM Module

NGSS (5-ESS3-1) Lesson 1, Lesson 2, Lesson 3, STEM Module

NGSS (3-5-ETS1-1) Lesson 3, STEM Module

NGSS (3-5-ETS1-2) Lesson 2, Lesson 3, STEM Module

NGSS (3-5-ETS1-3) Lesson 2, STEM Module

#### **Earth's Other Systems:**

NGSS (5-ESS2-1) Lesson 1, Lesson 2, Lesson 3, STEM Module

NGSS (5-ESS3-1) Lesson 1, Lesson 2, Lesson 3, STEM Module

- 5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.** [Clarification Statement: Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system.] [Assessment Boundary: Assessment is limited to the interactions of two systems at a time.]
- 5-ESS2-2. Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.** [Assessment Boundary: Assessment is limited to oceans, lakes, rivers, glaciers, ground water, and polar ice caps, and does not include the atmosphere.]
- 5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.**

**3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.**

**3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.**

**3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.**

#### **Quarter 4: Earth and Space Patterns**

During the fourth quarter, the 5th Grade students will have a busy end to their year. The students will be presenting their Science Fair projects, and during this quarter, the students will be taking the Science CRT Test. The Earth and Space Patterns unit consists of two learning modules with two lessons, as well as a STEM Module. The students will be learning about the role gravity plays in our universe, as well as how Earth moves through space.

In the first learning module of the unit, the first lesson will take course of 7-8 days. The students will begin learning about the patterns caused by Earth's movements. The students will gain an understanding of the role of gravity in relation to patterns of the Earth and Moon. Students will also support an argument that gravity causes objects to be pulled toward the center of Earth. The students will use activities that involve craters and water falling.

The second lesson will also span 7-8 science classes. During the lesson, the students will be exploring how Earth moves through space. The students will model the movement of Earth in Relationship to other objects in space. The students will be using hands-on activities with shadow measurements, a simulation online of Earth's movements, and a data analysis between three cities (Juneau, Alaska; Santiago, Galapagos Islands; Adelaide, Australia).

The STEM Module will take place over 2-3 classes. During this time, the students will work in small groups to build a planetarium model to show one of the following patterns in our solar system: changes in the length and direction of shadows, day and night, moon phases, or seasonal changes. The students will use an interactive project design, as well as have the opportunities to design a real model as well.

The second module has two lessons and a STEM Module as well. In the first lesson of the second module, the students will be learning about what causes different stars to appear during different seasons throughout the year, as well as where Earth is located in space. This lesson will take approximately 7-8 days. The students will explain Earth's location with the universe. The students will use models of the Sun, Earth, and Stars and of our Solar System with our interactive resources.

The second lesson of the module will also take the course of 7-8 classes. The students will be answering the essential question, "What causes some stars to be brighter than others?" The students will support an argument that some stars appear brighter than others due to their

relative distances. The students will be using an online model about star brightness, as well as a simulation of the night sky.

The STEM Module Project will take course over 3-4 class periods. The students will use what they learned throughout the module to design a model of a constellation. The students will use what they learned to explain the appearance of stars from Earth throughout the year.

Reteach students who are struggling how to use the resources available to them within the virtual components of the curriculum. This would include any accommodations built into the curriculum as well as any extensions being used such as “Screenshot Reader” or other relevant applications. Allow students who struggle with comprehension to complete as many hands-on tasks as possible during the unit as well as work with peers. For specific accommodations (i.e. graphic organizers, etc.), communicate with the grade level Special Education teacher.

For students who are above grade level, allow for opportunities to work independently and complete extension projects relevant to the current topic. This could be creating a presentation or completing an additional reading on the current lesson and objective.

### **Earth Patterns and Movement**

NGSS (5-ESS1-2) Lesson 1, Lesson 2, STEM Module Project

NGSS (5-PS2-1) Lesson 1, Lesson 2, STEM Module Project

### **Earth and Space**

NGSS (ESS1-1) Lesson 1, Lesson 2, STEM Module Project

NGSS (ESS1-2) Lesson 1, Lesson 2, STEM Module Project

**5-ESS1-1** **Support an argument that the apparent brightness of the sun and stars is due to their relative distances from the Earth.** [*Assessment Boundary: Assessment is limited to relative distances, not sizes, of stars. Assessment does not include other factors that affect apparent brightness (such as stellar masses, age, and stage).*]

**5-ESS1-2** **Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.** [*Clarification Statement: Examples of patterns could include the position and motion of Earth with respect to the sun and selected stars that are visible only in particular months.*] [*Assessment Boundary: Assessment does not include causes of seasons.*]

**5-PS2-1** **Support an argument that the gravitational force exerted by Earth on objects is directed down.** [*Clarification Statement: “Down” is a local description of the direction that points toward the center of the spherical Earth.*] [*Assessment Boundary: Assessment does not include mathematical representation of gravitational force.*]