

# FOSS and SEEd Standard Alignment

## Fifth Grade

### Strand 5.1: CHARACTERISTICS AND INTERACTIONS OF EARTH’S SYSTEMS

Earth’s major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). Within these systems, the location of Earth’s land and water can be described. Also, these systems interact in multiple ways. Weathering and erosion are examples of interactions between Earth’s systems. Some interactions cause landslides, earthquakes, and volcanic eruptions that impact humans and other organisms. Humans cannot eliminate natural hazards, but the solutions can be designed to reduce their impact.

STANDARDS	FOSS	MINIMUM
<p><b>5.1.1 Analyze and interpret data</b> to describe <u>patterns</u> of Earth's features. Emphasize most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans while major mountain chains may be found inside continents or near their edges. Examples of data could include maps showing locations of mountains on continents and the ocean floor or the locations of volcanoes and earthquakes. (ESS2.B)</p>	<p><b><i>Soils, Rocks, and Landforms</i></b> Investigation 2: Landforms Investigation 3: Mapping Earth’s Surface</p>	<p><b><i>Soils, Rocks, and Landforms</i></b> Investigation 2: Landforms Part 1 – 2 classes Part 2 – 2-4 classes Part 3 -1 class</p>
<p><b>5.1.2 Use mathematics and computational thinking</b> to compare the <u>quantity</u> of saltwater and fresh water in various reservoirs to provide evidence for the <u>distribution of water on Earth</u>. Emphasize reservoirs such as oceans, lakes, rivers, glaciers, groundwater, and polar ice caps. Examples of using mathematics and computational thinking could include measuring, estimating, graphing, or finding percentages of quantities. (ESS2.C)</p>	<p><b><i>Earth and Sun</i></b> Investigation 5, Part 3 “Water Cycle”</p>	<p><b><i>Earth and Sun</i></b> Investigation 5, Part 3 “Water Cycle”</p>
<p><b>5.1.3 Ask questions to plan and carry out investigations</b> that provide evidence for the <u>effects of weathering and the rate of erosion on the geosphere</u>. Emphasize weathering and erosion by water, ice, wind, gravity, or vegetation. Examples could include observing the effects of cycles of freezing and thawing of water on rock or changing the slope in the downhill movement of water. (ESS2.A, ESS2.E)</p>	<p><b><i>Soils, Rocks, and Landforms</i></b> Investigation 1: Soils and Weathering Investigation 2: Landforms</p>	<p><b><i>Soils, Rocks, and Landforms</i></b> Investigation 1 Soils and Weathering Part 2 – 2 classes Part 3 – 4 classes Investigation 2: Landforms Part 1 – 2 classes Part 2 – 2-4 classes Part 3 - 1 classes</p>

<p><b>5.1.4 Develop a model</b> to describe interactions between Earth's <u>systems</u> including the geosphere, biosphere, hydrosphere, and/or atmosphere. Emphasize interactions between only two systems at a time. Examples could include the influence of a rainstorm in a desert, waves on a shoreline, or mountains on clouds. (ESS2.A)</p>	<p><b>Living Systems</b> Investigation 1: Systems Investigation 4: Sensory Systems</p>	<p><b>Earth and Sun</b> Investigation 4 Part 3- 2 classes Part 4 – 6 classes</p> <p>OR</p> <p><b>Living Systems</b> Investigation 1: Systems Part 1- 3 classes Part 2 – 4 classes</p>
<p><b>5.1.5 Design solutions</b> to reduce the <u>effects</u> of naturally occurring events that impact humans. <i>Define the problem, identify criteria and constraints, develop possible solutions using models, analyze data from testing solutions, and propose modifications for optimizing a solution.</i> Emphasize that humans cannot eliminate natural hazards, but they can take steps to reduce their impacts. Examples of events could include landslides, earthquakes, tsunamis, blizzards, or volcanic eruptions. (ESS3.B, ETS1.A, ETS1.B, ETS1.C)</p>	<p><b>Soils, Rocks, and Landforms</b> Investigation 2: Landforms Investigation 3: Mapping Earth’s Surface</p>	<p><b>Soils, Rocks, and Landforms</b> Investigation 3: Mapping Earth’s Surface Part 3</p>

## Strand 5.2: PROPERTIES AND CHANGES OF MATTER

All substances are composed of matter. Matter is made of particles that are too small to be seen but still exist and can be detected by other means. Substances have specific properties by which they can be identified. When two or more different substances are combined a new substance with different properties may be formed. Whether a change results in a new substance or not, the total amount of matter is always conserved.

STANDARDS	FOSS	MINIMUM
<p><b>5.2.1 Develop and use a model</b> to describe that matter is made of particles on a <u>scale</u> that is too small to be seen. Emphasize making observations of changes supported by a particle model of matter. Examples could include adding air to expand a balloon, compressing air in a syringe, adding food coloring to water, or dissolving salt in water and evaporating the water. The use of the terms atoms and molecules will be taught in Grades 6 through 8. (PS1.A)</p>	<p><b>Mixtures and Solutions</b> Investigations 1: Separating Mixtures Investigations 2: Developing Models Investigations 3: Concentration Investigations 4: Reaching Saturation Investigations 5: Fizz Quiz</p>	<p><b>Mixtures and Solutions</b> Investigations 1: Separating Mixtures Part 1 (loosely) – 2 classes Part 2 (loosely) – 3 classes</p>

<p><b>5.2.2</b> Ask questions to <b>plan and carry out investigations</b> to identify substances based on <b>patterns</b> of their properties. Emphasize using properties to identify substances. Examples of properties could include color, hardness, conductivity, solubility, or a response to magnetic forces. Examples of substances could include powders, metals, minerals, or liquids. (PS1.A)</p>	<p><b>Mixtures and Solutions</b> Investigations 4: Reaching Saturation Investigations 5: Fizz Quiz</p>	<p><b>Mixtures and Solutions</b> Investigations 4: Reaching Saturation Part 1- 2 classes Part 2- 1 class Part 3- 3 classes Part 4- 7 classes</p>
<p><b>5.2.3</b> Plan and carry out investigations to determine the <b>effect</b> of combining two or more substances. Emphasize whether a new substance is or is not created by the formation of a new substance with different properties. Examples could include combining vinegar and baking soda or rusting an iron nail in water. (PS1.B)</p>	<p><b>Mixtures and Solutions</b> Investigations 5: Fizz Quiz</p>	<p><b>Mixtures and Solutions</b> Investigations 5: Fizz Quiz Part 1- 2 classes Part 2- 3 classes Part 3 – 4 classes</p>
<p><b>5.2.4</b> Use <b>mathematics and computational thinking</b> to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of <b>matter</b> is conserved. Examples could include melting an ice cube, dissolving salt in water, and combining baking soda and vinegar in a closed bag. (PS1.A, PS1.B)</p>	<p><b>Mixtures and Solutions</b> Investigations 1: Separating Mixtures Investigations 2: Developing Models Investigations 3: Concentration Investigations 4: Reaching Saturation Investigations 5: Fizz Quiz</p>	<p><b>Mixtures and Solutions</b> Investigations 5: Fizz Quiz Part 1- 2 classes Part 2- 3 classes Part 3 – 4 classes</p>

### Strand 5.3: CYCLING OF MATTER IN ECOSYSTEMS

Matter cycles within ecosystems and can be traced from organism to organism. Plants use energy from the Sun to change air and water into matter needed for growth. Animals and decomposers consume matter for their life functions, continuing the cycling of matter. Human behavior can affect the cycling of matter. Scientists and engineers design solutions to conserve Earth’s environments and resources.

STANDARDS	FOSS	MINIMUM
<p><b>5.3.1</b> Construct an explanation that plants use air, water, and <b>energy</b> from sunlight to produce plant <b>matter</b> needed for growth. Emphasize photosynthesis at a conceptual level and that plant matter comes mostly from air and water, not from the soil. Photosynthesis at the cellular level will be taught in Grades 6 through 8. (LS1.C)</p>	<p><b>Living Systems</b> Investigations 2: Nutrient Systems Investigation 3: Transport Systems</p>	<p><b>Living Systems</b> Investigations 2: Nutrient Systems Part 2 – 6 classes</p>

<p><b>5.3.2 Obtain, evaluate, and communicate information</b> that animals obtain <u>energy and matter</u> from the food they eat for body repair, growth, and motion and to maintain body <u>warmth</u>. Emphasize that the energy used by animals was once energy from the Sun. Cellular respiration will be taught in Grades 6 through 8. (PS3.D, LS1.C)</p>	<p><b>Living Systems</b>  Investigations 1: Systems  Investigations 2: Nutrient Systems  Investigations 3: Transport Systems  Investigations 4: Nutrient Systems</p>	<p><b>Living Systems</b>  Investigations 2: Nutrient Systems  Part 3 – 6 classes</p>
<p><b>5.3.3 Develop and use a model</b> to describe the movement of <u>matter</u> among plants, animals, decomposers, and the environment. Emphasize that matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Examples could include simple food chains from ecosystems such as deserts or oceans or diagrams of decomposers returning matter to the environment. Complex interactions in a food web will be taught in Grades 6 through 8. (LS2.A, LS2.B)</p>	<p><b>Living Systems</b>  Investigations 1: Systems  Investigations 2: Nutrient Systems  Investigations 3: Transport Systems  Investigations 4: Nutrient Systems</p>	<p><b>Living Systems</b>  Investigations 1: Systems  Part 3 – 3 classes</p>
<p><b>5.3.4 Evaluate design solution</b> whose primary <u>function</u> is to conserve Earth’s environments and resources. <i>Define the problem, identify criteria and constraints, analyze available data on proposed solutions, and determine an optimal solution.</i> Emphasize how humans can balance everyday needs (agriculture, industry, and energy) while conserving Earth’s environments and resources. (ESS3.A, ESS3.C, ETS1.A, ETS1.B, ETS1.C)</p>	<p><b>Living Systems</b>  Investigation 4: Nutrient Systems</p>	<p><b>Living Systems</b>  Investigations 1: Systems  Part 4 (prep) – 4 classes</p>