



Course Outcome Summary

Course Information: Science 5

Description: Students are expected to demonstrate grade-appropriate proficiency in developing and using models, planning and carrying out investigations, analyzing and interpreting data, using mathematics and computational thinking, engaging in argument from evidence, and obtaining, evaluating, and communicating information; and to use these practices to demonstrate understanding of the core ideas.

Instruction Level: Grade 5

Course Standards:

- Students can develop a model to describe that matter is made of particles too small to be seen.
- Students can 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.
- Students can make observations and measurements to identify materials based on their properties.
- Students can conduct an investigation to determine whether the mixing of two substances results in new substances.
- Students can support an argument that the gravitational force exerted by Earth on objects is directed down.
- Students can use models to describe that energy in animals' food was once energy from the sun.
- Students can develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
- Students can support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.
- Students can represent data in graphical displays to reveal patterns of daily changes in length and directions of shadows, day and night, and the seasonal appearance of some stars in the night sky.
- Students can develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
- Students can describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.
- Students can 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 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.

Units

1. **Structures, Properties, and Changes of Matter**
2. **Motion and Stability (Gravity)/Engineering Design –mini-unit**
3. **Earth’s Place in the Universe—mini-unit**
4. **Earth’s Systems**
5. **Human Impacts on Earth Systems**
6. **Energy and Relationships in Ecosystems—mini-unit integrated into reading Nonfiction**

Unit Outlines

1. **Structures, Properties, and Changes of Matter/ also push into MATH—AREA and VOLUME**

Standards:

- Understand vocabulary of scientific investigations/experiments and can carry out simple investigations.
- Understand that matter is made of atoms
- Understand properties such as color, length, volume, odor, and density
- Understand that matter changes form but does not lose mass/weight.

Essential Question:

Students will be able to answer the question(s):

- How can matter change?

Essential Knowledge:

What are the key concepts/vocabulary/ideas that students will have mastery of by the completion of the unit?

- I can understand use scientific vocabulary in my speaking and writing.
- I can plan and carry out simple investigations, record, interpret, and analyze data.
- I can describe matter as having weight/mass and taking up space.
- I can observe, describe, and measure the properties of matter.
- I can explain that matter is made of atoms.
- I can explain how matter changes.

2. **Motion and Stability/ ETS 1 Engineering and Design**

Standards:

- Support an argument that the gravitational force exerted by Earth on objects is directed down.

Essential Question:

Students will be able to answer the question(s):

- What is gravity and how does it affect objects near the Earth's surface?

Essential Knowledge:

What are the key concepts/vocabulary/ideas that students will have mastery of by the completion of the unit?

- I can describe the gravitational force of Earth acting on an object near Earth.

3. Earth's Place in the Universe/also push into MATH-Measuring length and graphing**Standards:**

- Understand that the sun is a star that appears larger and brighter than other stars because it is closer
- Understand that stars range greatly in their distance from Earth
- Understand that rotation and revolution cause observable patterns including day and night, length of shadows, and different positions of the sun, moon, and stars at different times of year.

Essential Question:

Students will be able to answer the question(s):

- How does the Earth's place in the universe affect life on Earth?

Essential Knowledge:

What are the key concepts/vocabulary/ideas that students will have mastery of by the completion of the unit?

- I can support the argument that our sun seems brighter because it's the closest star.
- I can graph data to show patterns caused by the Earth's rotation and revolution.

4. Earth's Systems**Standards:**

- Identify and explain characteristics of major Earth systems: geosphere, hydrosphere, biosphere, atmosphere.
- Understand some ways that Earth's systems interact.
- Understand nearly all of Earth's available water is in ocean and most fresh water is in glaciers or underground.

Essential Question:

Students will be able to answer the question(s):

- How do Earth's systems interact to affect Earth's surface materials and processes?

Essential Knowledge:

What are the key concepts/vocabulary/ideas that students will have mastery of by the completion of the unit?

- I can develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
- I can describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

5. Human Impacts on Earth Systems-possibly integrate into Opinion Writing**Standards:**

- Understand that human activities have had major effects on land, vegetation, streams, ocean, air, and even outer space.
- Students can obtain and combine information about ways people use science ideas to protect Earth's resources and environment.

Essential Question:

Students will be able to answer the question(s):

- In what ways do human activities affect the land, vegetation, water, air and space?

Essential Knowledge:

What are the key concepts/vocabulary/ideas that students will have mastery of by the completion of the unit?

- I can identify what ways human activities affect the Earth's land, vegetation, water, air and even outer space.

6. Matter & Energy and Relationships in Ecosystems-Integrated into Reading Nonfiction Unit**Standards:**

- Understand the roles and relationships of plants, animals, decomposers in ecosystems.
- Understand that a healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life.
- Understand that newly introduced species can damage the balance of an ecosystem.
- Understand that matter cycles between the air and soil.

Essential Question:

Students will be able to answer the question(s):

- How do matter and energy cycle through ecosystems?

Essential Knowledge:

What are the key concepts/vocabulary/ideas that students will have mastery of by the completion of the unit?

- I can explain the roles and relationships of plants, animals, and decomposers in ecosystems.
- I can identify an ecosystem as healthy or unhealthy.
- I can develop a model to show how matter cycles between air and soil and among plants, animals, and microbes as organisms live and die.

