Sparta Area School District

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Course Outcome Summary

Course Information: 7th Grade Science

Description: In this course students will learn and apply the scientific skills of Interpretation of Data, Scientific Investigation, and Evaluation of Models, Inferences, and Experimental Results through the content topics of ecology, waves (sound and electromagnetic waves), cells, and heredity.

Instruction Level: 7th Grade

Course Standards: ACT College and Career Readiness Standards

Standard 1: Select one piece of data from a simple data presentation (e.g., a simple food web diagram)
Standard 2: Identify basic features of a table, graph, or diagram (e.g., units of measurement)
Standard 3: Find basic information in text that describes a simple data presentation
Standard 4: Find basic information in text that describes a simple experiment
Standard 5: Understand the tools and functions of tools used in a simple experiment
Standard 6: Find basic information in a model (conceptual)

Textbook: Prentice Hall's Nature of Science and Technology, Environmental Science Sound and Light, Cells (ISBN 978-0- 13-365122- 5)

Units

1. **Scientific Method**
2. **Ecology**
3. **Waves**
4. **Cells**
5. **Genetics/Heredity**
6. **Adaptations**

Unit Outlines

1. Scientific Method

Standards:

- Understand tools and their functions used in a simple experiment

- Identify basic features of a table, graph, or diagram
- Find basic information in text that describes a simple data presentation

Essential Question:

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

- How do we use scientific investigation to find answers to questions?

Essential Knowledge:

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

- Students will be able to design, use and analyze experiments.
- Students will be able to form hypotheses and valid conclusions.
- Students will be able to accurately measure length (in metric) volume, mass, and temperature (Celsius).

2. Ecology

Standards:

- Understand basic science terms
- Understand tools and their functions used in a simple experiment
- Find basic information in a model (conceptual)

Essential Question:

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

- Do interactions in nature cause a balance of populations?
- How would my life change without the carbon, oxygen, and nitrogen cycles?
- Why is it important to understand the water cycle?

Essential Knowledge:

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

Students will be able to:

a) classify energy roles as producers (plants) or consumers (herbivore, carnivore, omnivore, scavenger, decomposer)
b) create food webs that show the transfer of energy in nature
c) explain how limiting factors affect populations in an ecosystem
d) identify human activities that harm groundwater
e) compare biomes according to their climates and species
f) contrast 3 types of symbiosis (mutualism, commensalism, and parasitism)
g) illustrate how an invasive species impacts a community

3. Waves

Standards:

- Select a single piece of data from a table or graph with 2 or 3 variables
- Find basic information in text that describes a simple data presentation
- Understand the tools and their functions used in a simple experiment

Essential Question:

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

- How am I affected by energy that travels in waves?

Essential Knowledge:

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

Students will be able to:

a) determine properties of a wave (wavelength, amplitude, frequency, and speed)
b) explain how mechanical waves are different than electromagnetic waves
c) identify 7 types of EM (electromagnetic) waves
d) demonstrate reflection and refraction of light
e) investigate aspects of sound (create own sound experiment)

4. Cells

Standards:

- Find basic information in text that describes a simple data presentation
- Understand basic science terms
- Find basic information in a model (conceptual)

Essential Question:

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

- Why are humans made up of different types of cells?

Essential Knowledge:

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

Students will be able to

a) distinguish between cell parts and their jobs
b) assemble a model showing the steps of cell division
c) use a microscope to view microorganisms

5. Genetics

Standards:

- Find basic information in text that describes a simple data presentation

Essential Question:

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

- How has understanding genetics helped humans?

Essential Knowledge:

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

Students will

a) use Punnett Squares to figure probability of a trait in offspring
b) determine who is affected with a sex-linked disorder (such as colorblindness) by using a pedigree
c) illustrate the cloning process

6. Adaptations

Standards:

- Select 2 or more pieces of data from a simple data presentation
- Understand basic science terms
- Find basic information in text that describes a complex data presentation
- Understand the methods used in a simple experiment

Essential Question:

- Students will be able to answer the question(s):
- Does "survival of the fittest" work in all species?
- How can dissecting a frog help me understand physical adaptations?

Essential Knowledge:

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

Students will be able to

a) explain how nature selects which traits are passed on through generations
b) identify types of evidence for evolution
c) dissect northern leopard frog and identify internal organs and their functions