COURSE INFORMATION

Grade Level: 1
Length: Year

ESSENTIAL UNDERSTANDING

In 1st Grade, students will be exposed to 4 strands of science: physical science, life science, earth and space science and engineering and design. Students should be able to read first grade level science text, understand material read to them, and plan and conduct investigations to increase understanding.

COURSE OBJECTIVES

1. Literary skills will be applied to science non-fiction text.
2. Design and conduct investigations and/or experiments.
3. Use and analyze texts, experiments, investigations, and visual sources in order to increase understanding.
4. Students will have an understanding that sound is made through vibration.
5. Understand that items can only be seen when illuminated.
6. Model or build devices that facilitate communication through light or sound.
7. Model animal and plant structures that show how each function is needed for survival.
8. Compare and contrast how plants and animals are like but not exactly like parents.
9. Create models of the patterns of sun, moon and stars that can be predicted.
10. Prove that daylight is different at different times of the year.

STUDENT OBJECTIVES

1. I can read grade-level nonfiction science text.
2. I can design and conduct experiments.
3. I can understand that sound is made by an object vibrating.
4. I can investigate how illumination affects my ability to see an item.
5. I can create a model to show that shows how to communicate through light or sound.
6. I can an environment that show what plants and animals need to survive.
7. I can provide examples of how plants and animals are like, but not exactly like their parents.
8. I can create a model that shows how sun, moon and star patterns can be predicted.
9. I can explain how daylight is longer or shorter at different times of the year.

PACING

TOPIC	STANDARD	EXPERIMENTS/PROJECTS
(Trimester 1) **Earth's Place in the Universe**	Earth Science ESS1-1 ● Use information of the sun, moon and stars to describe patterns that can be predicted	
(Trimester 1) **Earth's Place in the Universe**	Earth Science ESS1-2 ● make observations at different times of year to relate the amount of daylight to the time of year.	
(Trimester 2) **Waves: Light and Sound**	Physical Science 1-PS4-1 ● plan and conduct investigations to provide evidence that vibrating materials can make sound can cause materials to vibrate ● make observations to construct and evidence based explanation that objects can be seen only when illuminated ● plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam light. ● design a solution that facilitates communication over distance using light and sound.	

(Trimester 3) **From Molecules to Organisms: Structures and Processes**	Life Science LS1 ● plan and conduct an investigation to design a solution to a human problem by mimicking how plants and /or animals use their external parts to help them survive, grow and meet their needs. ● use information from print and other media to identify patterns in behavior of parents and offspring to help them survive.	
(Trimester 3) **Heredity: Inheritance and Variation of Traits**	Life Science LS3 ● Make and evidence based explanation of how young plants and animals are like but not exactly like their parents	● mealworms ● Caterpillars/butterfly kits ● Seed growing ● AIMS units

Trimester 1
Earth's Place in the Universe **1-ESS1-1. 1-ESS1-2.**

Trimester 2
Waves, Light and Sound **1-PS4-1. 1-PS4-2. 1-PS4-3, 1-PS4-4.**

Trimester 3
From Molecules to Organisms: Structures and Processes 1-LS1-1. 1-LS1-2
Heredity: Inheritance and Variation of Traits **1-LS3-1.**

<u>Montana's Next Generation Science Standards:</u>

Physical Science PS4

1-PS4-1. Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. [Clarification Statement: Examples of vibrating materials that make sound could include tuning forks and plucking a stretched string. Examples of how sound can make matter vibrate could include holding a piece of paper near a speaker making sound and holding an object near a vibrating tuning fork.]

1-PS4-2. Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated.[Clarification Statement: Examples of observations could include those made in a completely dark room, a pinhole box, and a video of a cave explorer with a flashlight. Illumination could be from an external light source or by an object giving off its own light.]

1-PS4-3. Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light. [Clarification Statement: Examples of materials could include those that are transparent (such as clear plastic), translucent (such as wax paper), opaque (such as cardboard), and reflective (such as a mirror).] [*Assessment Boundary: Assessment does not include the speed of light.*]

1-PS4-4. Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.* [Clarification Statement: Examples of devices could include a light source to send signals, paper cup and string "telephones," and a pattern of drum beats.] [*Assessment Boundary: Assessment does not include technological details for how communication devices work.*]

Life Science LS1

1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.* [Clarification Statement: Examples of human problems that can be solved by mimicking plant or animal solutions could include designing clothing or equipment to protect bicyclists by mimicking turtle shells, acorn shells, and animal scales; stabilizing structures by mimicking animal tails and roots on plants; keeping out intruders by mimicking thorns on branches and animal quills; and, detecting intruders by mimicking eyes and ears.]

1-LS1-2. **Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.**[Clarification Statement: Examples of patterns of behaviors could include the signals that offspring make (such as crying, cheeping, and other vocalizations) and the responses of the parents (such as feeding, comforting, and protecting the offspring).]

Life Science LS3

1-LS3-1. **Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.** [Clarification Statement: Examples of patterns could include features plants or animals share. Examples of observations could include leaves from the same kind of plant are the same shape but can differ in size; and, a particular breed of dog looks like its parents but is not exactly the same.] [*Assessment Boundary: Assessment does not include inheritance or animals that undergo metamorphosis or hybrids.*]

Earth and Space Science ESS1

1-ESS1-1. **Use observations of the sun, moon, and stars to describe patterns that can be predicted.** [Clarification Statement: Examples of patterns could include that the sun and moon appear to rise in one part of the sky, move across the sky, and set; and stars other than our sun are visible at night but not during the day.] [*Assessment Boundary: Assessment of star patterns is limited to stars being seen at night and not during the day.*]

1-ESS1-2. **Make observations at different times of year to relate the amount of daylight to the time of year.** [Clarification Statement: Emphasis is on relative comparisons of the amount of daylight in the winter to the amount in the spring or fall.] [*Assessment Boundary: Assessment is limited to relative amounts of daylight, not quantifying the hours or time of daylight.*]

RESOURCES

Montana Board of Public Education. “Montana Science Content Standards.” *Class 3 Administrator's License - Superintendent and Principal*, 16 Sept. 2016, opi.mt.gov/.

“Next Generation Science Standards.” *NGSS Fact Sheet | Next Generation Science Standards*, 10 Dec. 2018, Next Generation Science Standards website.

Foss Kits

Reading Street Anthology