

Marlboro Elementary School Grade 2 Science Curriculum

Quarter 1: Scientific and Engineering Process

- **K-2-ETS1-1:** Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool
- **K-2-ETS1-2:** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
- **K-2-ETS1-3:** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Scientific and Engineering Practices

- Ask questions and define problems
- Develop and use models
- Analyze and interpret data

Prerequisite Knowledge- How scientists use their 5 senses to observe and record information (Grade K and Grade 1) What a scientist is (Grade K) What tools scientists use (Grade K) Science safety (Grade K)

Vocabulary: scientist, hypothesis, observe, data, model, reflect, Scientific Process

Disciplinary Core Ideas

- A- Ask questions, make observations, and gather information to clearly understand the problem
 - a. What do scientists do?
 - b. What kinds of jobs do scientists have?
 - c. How do scientists make questions about a problem?
 - d. How do scientists make observations?
 - e. What do engineers do?
 - f. What process do engineers follow?
- B- Develop a possible solution through making sketches, drawings, or models
 - a. How do scientists draw details about observations?
 - b. How do scientists write about what they observe?
- C- Optimize and design solutions by comparing different solutions and reflecting on designs
 - a. How do scientists share their data?
 - b. How do scientists reflect on their findings?

Steps of the Scientific Method:

Step 1: Ask a Question- What do we want to find out?

Step 2: Make a Hypothesis- What do you think will happen?

Step 3: Design a Plan- How do you want to solve the problem?

Step 4: Conduct an Experiment- What steps did we follow?

Step 5: Draw a Conclusion- What did you learn?

Step 6: Reflect- What went well? What could you do differently next time?

Quarter 2: Structure and Properties of Matter

- **2-PS1-1:** Plan and Conduct an Investigation to describe and classify different kinds of materials by their observable properties
- **2-PS1-2:** Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose
- **2-PS1-3:** Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object
- **2-PS1-4:** Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot

Scientific and Engineering Practices

- Plan and carry out investigations
- Analyze and interpret data
- Construct explanations and design solutions
- Engage in arguments from evidence

Prerequisite Knowledge- What comes from nature and what is manmade (Grade K) How sound travels through matter (Grade 1) How light travels through matter (Grade 1)

Vocabulary: matter, solid, liquid, gas, property, deconstruct, strength, flexibility, hardness, texture, absorb, substance

Disciplinary Core Ideas

A- Structure and Properties of Matter

- a. Can matter be found in different forms?
 - i. Solid
 - ii. Liquid
 - iii. Gas
- b. Can matter can be classified by observable properties?
 - i. Strength
 - ii. Flexibility
 - iii. Hardness
 - iv. Texture

- v. Absorbency
 - c. Can objects be built up from a small set of pieces?
 - d. Can objects be deconstructed from a large set of pieces?
- B- Chemical Reactions
- a. Does heating or cooling a substance cause changes that can be observed?
 - b. Does heating or cooling a substance cause changes that can be reversed?

Quarter 3: Interdependent Relationships in Ecosystems

- **2-LS2-1:** Plan and conduct an investigation to determine if plants need sunlight and water to grow.
- **2-LS2-2:** Develop a simple model that illustrates how plants and animals depend on each other for survival
- **2-LS4-1:** Make an observation of plants and animals to compare the diversity of life in different habitats

Scientific and Engineering Practices

- Develop and use models
- Plan and carry out investigations

Prerequisite Knowledge- What plants and animals need to live and grow (Grade K), Plants and animals change their environments (Grade K) Watching plants grow (Grade K and Grade 1) Parts of a Plant (Grade K and Grade 1) Plant Life Cycle (Grade K) How animals move (Grade 1) Animal Habitats (Grade 1) Camouflage (Grade 1) Classifying animals (Grade 1) Animal families (Grade 1) What a seed is (Grade 1)

Vocabulary: food chain, predator, prey, photosynthesis, life cycle, pollination, ecosystem, biome

Disciplinary Core Ideas

- A- Interdependent Relationships in Ecosystems
 - a. How do plants and animals depend on each other for food?
 - i. What characteristics do animals have?
 - ii. What characteristics do plants have?
 - iii. Food chains- predators and prey
 - iv. Photosynthesis
 - b. How do plants depend on animals for pollination and dispersal of seeds?
 - i. Bees and Butterflies- pollination
 - ii. Birds- dispersal of seeds
- B- Biodiversity and Humans

- a. What places on land and in water do living things exist?
 - i. What is a forest?
 - ii. What is the arctic?
 - iii. What is the desert?
 - iv. What is a grassland?
 - v. What does aquatic mean?
 1. Marine
 2. Freshwater
 - b. How do multiple living things live in an area?
 - i. Forest Ecosystem
 - ii. Arctic Ecosystem
 - iii. Desert Ecosystem
 - iv. Grassland Ecosystem
 - v. Aquatic Ecosystems
 1. Marine
 2. Freshwater
- C- Developing Possible Solutions
- a. Represent ideas using sketches, drawings, or models
 - b. Communicate ideas to other people

Quarter 4: Processes that Shape the Earth

- **2-ESS1-1:** Use information from several sources to provide evidence that Earth events can occur quickly or slowly
- **2-ESS2-1:** Compare multiple solutions designed to slow or prevent wind or water
- **2-ESS2-2:** Develop a model to represent the shapes and kinds of land and bodies of water in an area
- **2-ESS2-3:** Obtain information to identify where water is found on Earth and that it can be solid or liquid

Scientific and Engineering Practices

- Develop and use models
- Construct explanations and design solutions
- Obtain, evaluate, and communicate information

Prerequisite Knowledge- Planet Earth (Grade K)

Vocabulary- erosion, weathering, deposit, transport, landform, water cycle

Disciplinary Core Ideas

- A- The History of Plant Earth
 - a. How long does it take an event to occur?
 - i. Quick events we can observe
 - ii. Long time periods one cannot observe
- B- Earth Materials and Systems
 - a. How do wind and water change the shape of the land?
 - i. Erosion
 - ii. Weathering
 - iii. Deposit materials
 - iv. Transport materials
- C- Plate Tectonics and Large-Scale System Interactions
 - a. How do maps show the shapes of land and water?
 - b. What are different landforms on earth?
- D- The Roles of Water in Earth's Surface Processes
 - a. Where is water found?
 - i. Ocean
 - ii. Rivers
 - iii. Lakes
 - iv. Ponds
 - v. Water cycle- solid liquid gas states
- E- Optimizing the Design Solution

5E's Lesson Plan

Day 1: Engage- wonder journal (access prior knowledge)

Days 2 and 3: Explore- students discover and explore

Day 4: Explain- teacher explains about science behind explorations

Day 5: Elaborate- discuss what they notice

Day 6: Evaluate- teacher assessment