

**Science  
Grade Two**

**CURRICULUM GUIDE  
Approved  
August 22, 2017**

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**This curriculum may be modified through varying techniques,  
strategies and materials, as per an individual student's  
Individualized Education Plan (IEP).**

**Approved by the Insert district Board of Education  
At the regular meeting held on August 22, 2017  
And  
*Aligned with the New Jersey Student Learning Standards***

## **Table of Contents**

Component	Page
<b>Philosophy and Rationale:</b>	2
<b>Scope and Sequence:</b>	3
<b>Mission Statement:</b>	4
<b>Units:</b>	4-16
<b>NJ Content Standards Link:</b>	16
<b>21<sup>st</sup> Century Skills Link:</b>	16

### **Philosophy and Rationale**

As global citizens, our students will need to meet the rigors of an ever changing, evolving world that in every component of society is touched and driven by science, engineering and technology. Science demands skills such as observing, questioning, problem-solving, and logical reasoning utilizing the ability to synthesize data to solve current and future problems facing our global society. Science is intertwined with language arts, mathematics, and demands interpersonal skills as well. Students must be afforded the opportunity to explore and gain crucial team problem solving skills by hands on opportunities such as STEM projects to build this skill set. Being able to articulate and apply this broad foundation will enable students to make daily decisions based upon their knowledge of technology, engineering and science.

### **Scope and Sequence**

This curriculum is divided into four units which span the entire school year (180 days). The units are grouped based on academic standards and follow the Houghton Mifflin Harcourt Science Curriculum. Unit 1 covers The Nature of Science and S.T.E.M., Unit 2 Life Science- covers Animals, Plants and their Habitats, Unit 3 covers Earth Science- Earth and its Resources, All About Weather and the Solar System, and Unit 4 covers Physical Science-Changes in Matter and Energy and Magnets.

### **Mission Statement**

The Great Meadows Regional School District will provide quality educational opportunities that ensure the individual success of all students within a safe and supportive environment and to build lifelong learners who will meet society's challenges into and beyond the 21<sup>st</sup> century. To that end, it is anticipated that all students will achieve the New Jersey Student Learning Standards at all grade levels.

## **I. Unit 1: Science: Nature of Science and S.T.E.M.**

### **Stage 1: Desired Results**

#### **Content Standards**

- **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

#### **Essential Questions**

- How Do We Use Inquiry Skills?
- How Do We Use Science Tools?
- What Tools Can We Use?
- How Do Scientists Think?
- How Do We Solve a Problem?
- What is the design process?
- What is technology and how can we improve it?

#### **Enduring Understandings**

- Scientists ask questions about the world around them. They find answers by investigating through many methods.
- Engineers use a process to design new technology to meet human needs.
- Technology affects our everyday life and can affect the environment around us.

#### **Knowledge and Skills (SWBAT embedded course proficiencies)**

- Use inquiry skills such as measuring and representing measurements in a bar graph.
- Conduct an investigation using *inferring* to investigate an object.
- Use science tools to determine how much water a container holds.
- Plan and conduct an investigation of an object with science tools (e.g. hand lenses).
- Ask and raise questions about the world around you.
- Organize and analyze data.
- Plan and conduct an investigation to use the scientific method while measuring objects.
- Identify how technology affects everyday life and how it can affect the environment.
- Recognize the benefits of new technology.

## **Stage 2: Evidence of Understanding, Learning Objectives and Expectations**

Benchmarks (embedded student proficiencies)

Assessment Methods (formative, summative, other evidence and/or student self-assessment)

- HMH Science Dimensions text
- Interactive Smartboard experiences-teacher created or HMH Science Dimensions text,
- Read alouds-trade books and HMH Dimensions leveled readers
- Anecdotal and teacher observations
- Whole group and small group discussions
- Student reflections using Self-Check assignments and science notebooks
- In-class assessments
- Small center supplemental activities
- Read/Write/Share assignments
- Lab exploration

## **Stage 3: Learning Plan**

Evidence of Engaging Students

- Students will be engaged through:
  - large and small group discussions
  - allowing students to revise, rethink, and refine their understanding of covered topics.

Evidence of Differentiation

- Differentiation will be provided through:

- Written, visual, auditory, and hands-on activities to meet all learning styles.
- Students will be provided with individualized instruction as needed.
- Introduction of new vocabulary words will help students express their ideas, opinions, and feelings

### Integration of 21<sup>st</sup> Century Skills

- In this Unit, students will practice the 21<sup>st</sup> century skills of Communication and Collaboration

### Integration of 21<sup>st</sup> Century Learning

- We focus on many Life and Career skills by supporting students' interactions with peers and teachers throughout the school day.

### Time Allotment

- 22 Days inclusive of introduction and assessment

### Resources

- HMH Science Fusion text
- Read Alouds-trade books
- HMH Science Fusions leveled readers
- Bookflix,
- Smartboard Interactive Lessons-teacher created and HMH Science Fusions
- Scholastic magazine Science Spin and Scholastic Let's Find Out
- Supplemental games/activities from Teacher's Pay Teachers and small group teacher created activities
- Website/interactive activities: [www.pbskids.org](http://www.pbskids.org),  
<https://www.lisd.org/technology/itswebs/elem/curr/science/2sciwebsites.htm>

## **II. Unit 2: Science: Animals, Plants and Their Habitats**

### **Stage 1: Desired Results**

#### Content Standards

- **2-LS4-1:** Make observations of plants and animals to compare the diversity of life in different habitats.
- **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 mimics the function of an animal in dispersing seeds or pollinating plants.
- **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.

#### *Cross Curricular-ELA/Literacy*

- **W.2.7** Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-LS4-1)
- **W.2.8** Recall information from experiences or gather information from provided sources to answer a question. (2-LS4-1)
- **SL.2.5** Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (2-LS2-2)

#### *Cross Curricular-Mathematics*

- **MP.2** Reason abstractly and quantitatively. (2-LS4-1)
- **MP.4** Model with mathematics. (2-LS4-1)
- **MP.5** Use appropriate tools strategically. (2-LS2-1)
- **2.MD.D.10** Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems. (2-LS4-1)

### Essential Questions

- What do plants need to grow?
- How do plants change as they grow?
- What are animal needs?
- What are some kinds of animals?
- How do body coverings help animals?
- What are some animal life cycles?
- What are fossils?
- What are plant needs?
- What are some plant parts?
- What are some plant life cycles?
- How does a bean plant grow?
- How do plants and animals need one another?
- How do living things adapt to their environment?
- Can plants survive in different climates?
- How do environments change over time?

### Enduring Understandings

- There are many kinds of animals.
- Animals need certain things to live and grow.
- Fossils help us learn about animals that lived long ago.
- All plants need certain things to live and grow
- Plants have parts that help them grow and change.
- Living things meet their needs in their environments.

- Environments change over time.

### **Knowledge and Skills (SWBAT embedded course proficiencies)**

- Identify the basic needs of animals and humans.
- Compare and contrast the basic needs of plants and animals.
- Describe the parts of a farm system.
- Identify types of technology used on a farm.
- Describe and compare different types of animals.
- Observe and compare the physical characteristics of animals.
- Explain that different animals have different life cycles.
- Identify animals which undergo a metamorphosis during their life cycles.
- Describe sequence of stages of different animals' life cycles.
- Understand scientists always investigate new ways to solve problems.
- Explain what a fossil is.
- Explain how fossils provide information about plants and animals that lived long ago.
- Explain how fossils form.
- Investigate whether plants need sunlight
- Plan and conduct an investigation to observe lack of oxygen to plants.
- Predict and investigate growth of plants when growing conditions are altered.
- Investigate to find out how plant parts help plants stay alive.
- Observe and describe the life cycle of a plant
- Observe how water plants produce oxygen and support the survival of fish
- Plan and model a food chain.
- Make observations of different plants in a variety of habitats.
- Investigate how to protect an environment.

### **Stage 2: Evidence of Understanding, Learning Objectives and Expectations**

**Benchmarks** (embedded student proficiencies)

**Assessment Methods** (formative, summative, other evidence and/or student self-assessment)

- HMH Science Dimensions text
- Interactive Smartboard experiences-teacher created or HMH Science Dimensions text,
- Read alouds-trade books and HMH Dimensions leveled readers
- Anecdotal and teacher observations
- Whole group and small group discussions
- Student reflections using Self-Check assignments and science notebooks
- In-class assessments
- Small center supplemental activities
- Read/Write/Share assignments



- Lab exploration

### **Stage 3: Learning Plan**

#### **Evidence of Engaging Students**

- Students will be engaged through:
  - large and small group discussions
  - allowing students to revise, rethink, and refine their understanding of covered topics.

#### **Evidence of Differentiation**

- Differentiation will be provided through:
  - Written, visual, auditory, and hands-on activities to meet all learning styles.
  - Students will be provided with individualized instruction as needed.
  - Introduction of new vocabulary words will help students express their ideas, opinions, and feelings

#### **Integration of 21<sup>st</sup> Century Skills**

- In this Unit, students will practice the 21<sup>st</sup> century skills of Communication and Collaboration

#### **Integration of 21<sup>st</sup> Century Learning**

- We focus on many Life and Career skills by supporting students' interactions with peers and teachers throughout the school day.

### **Time Allotment**

- 42 Days inclusive of introductions and assessments

### **Resources**

- HMH Science Fusion text
- Read Alouds-trade books
- HMH Science Fusions leveled readers
- Bookflix,
- Smartboard Interactive Lessons-teacher created and HMH Science Fusions
- Scholastic magazine Science Spin and Scholastic Let's Find Out
- Supplemental games/activities from Teacher's Pay Teachers and small group teacher created activities
- Website/interactive activities: [www.pbskids.org](http://www.pbskids.org),  
<https://www.lisd.org/technology/itswebs/elem/curr/science/2sciwebsites.htm>

### **III. Unit 3: Science: Earth Science-Earth and its Resources, All About Weather and the Solar System**

#### **Stage 1: Desired Results**

##### **Content Standards**

- **2-ESS2-1.** Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.\*
- **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

##### *Cross Curricular-ELA/Literacy*

- **W.2.7** Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-LS4-1)
- **W.2.8** Recall information from experiences or gather information from provided sources to answer a question. (2-LS4-1)
- **SL.2.5** Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (2-LS2-2)

##### *Cross Curricular-Mathematics*

- **MP.2** Reason abstractly and quantitatively. (2-LS4-1)
- **MP.4** Model with mathematics. (2-LS4-1)
- **MP.5** Use appropriate tools strategically. (2-LS2-1)
- **2.MD.D.10** Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems. (2-LS4-1)

##### **Essential Questions**

- What are natural resources?
- What changes Earth?
- How does weather change?
- How does the sun heat the Earth?
- What are some weather patterns?
- How do seasons affect living things?
- How can we prepare for severe weather?
- What causes day and night?
- What are planets and stars?

### Enduring Understandings

- Changes can occur to Earth's surface.
- People need Earth resources like rock, plants, and water.
- Weather changes from day to day and from season to season
- It is important to measure and track weather over time.
- Earth is a planet in our solar system.
- Changes happen on Earth and in the sky from day to night.

### Knowledge and Skills (SWBAT embedded course proficiencies)

- Observe changes in the Earth by simulating a model earthquake.
- Plan and investigate the changes in the Earth from soil erosion.
- Identify natural resources in the world around you.
- Identify and classify products produced from plants
- Observe, measure, and record weather over a period of time.
- Build a tool that measures wind.
- Measure temperature using a thermometer.
- Demonstrate how heat energy, from the sun, warms the water, land, and the air.
- Identify patterns in temperature change.
- Use knowledge of weather patterns to predict high and low temperatures each day.
- Make and use a rain gauge to observe and measure precipitation.
- Determine why some animals change color during different seasons.
- Observe the effects of severe weather by creating a model tornado.

## **Stage 2: Evidence of Understanding, Learning Objectives and Expectations**

### Benchmarks (embedded student proficiencies)

### Assessment Methods (formative, summative, other evidence and/or student self-assessment)

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- Interactive Smartboard experiences-teacher created or HMH Science Dimensions text,
- Read alouds-trade books and HMH Dimensions leveled readers
- Anecdotal and teacher observations
- Whole group and small group discussions
- Student reflections using Self-Check assignments and science notebooks
- In-class assessments
- Small center supplemental activities
- Read/Write/Share assignments
- Lab exploration

## **Stage 3: Learning Plan**

### **Evidence of Engaging Students**

- Students will be engaged through:
  - large and small group discussions
  - allowing students to revise, rethink, and refine their understanding of covered topics.

### **Evidence of Differentiation**

- Differentiation will be provided through:
  - Written, visual, auditory, and hands-on activities to meet all learning styles.
  - Students will be provided with individualized instruction as needed.
  - Introduction of new vocabulary words will help students express their ideas, opinions, and feelings

### **Integration of 21<sup>st</sup> Century Skills**

- In this Unit, students will practice the 21<sup>st</sup> century skills of Communication and Collaboration

### **Integration of 21<sup>st</sup> Century Learning**

- We focus on many Life and Career skills by supporting students' interactions with peers and teachers throughout the school day.

## **Time Allotment**

- 36 Days inclusive of introductions and assessments

## **Resources**

- HMH Science Fusion text
- Read Alouds-trade books
- HMH Science Fusions leveled readers
- Bookflix,
- Smartboard Interactive Lessons-teacher created and HMH Science Fusions
- Scholastic magazine Science Spin and Scholastic Let's Find Out
- Supplemental games/activities from Teacher's Pay Teachers and small group teacher created activities
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## **IV. Unit 4: Science: Physical Science: Changes in Matter, Energy and Magnets**

### **Stage 1: Desired Results**

#### **Content Standards**

- **2-PS1-1.** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.]
- **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.\* [Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.] [Assessment Boundary: Assessment of quantitative measurements is limited to length.]
- **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. [Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.]
- **2-PS1-4.** Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. [Clarification Statement: Examples of reversible changes could include materials such as water and butter at different temperatures. Examples of irreversible changes could include cooking an egg, freezing a plant leaf, and heating paper.]

#### *Cross Curricular-ELA/Literacy*

- **RI.2.1** Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (2-PS1-4)
- **RI.2.3** Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-PS1-4)
- **RI.2.8** Describe how reasons support specific points the author makes in a text. (2-PS1-2),(2-PS1-4)
- **W.2.1** Write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons that support the opinion, use linking words (e.g., because, and, also) to connect opinion and reasons, and provide a concluding statement or section. (2-PS1-4)
- **W.2.7** Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-PS1-1),(2-PS1- 2),(2-PS1-3)

- **W.2.8** Recall information from experiences or gather information from provided sources to answer a question. (2-PS1-1),(2-PS1-2),(2-PS1-3)

#### *Cross Curricular-Mathematics*

- **MP.2** Reason abstractly and quantitatively. (2-PS1-2)
- **MP.4** Model with mathematics. (2-PS1-1),(2-PS1-2)
- **MP.5** Use appropriate tools strategically. (2-PS1-2)
- **2.MD.D.10** Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (2-PS1-1),(2-PS1-2)

#### Essential Questions

- What is matter and how does it change?
- How does water change states?
- How can we compare volumes?
- What is energy?
- What are magnets and how strong are they?

#### Enduring Understandings

- Everything is made of matter and is in one of the following property forms: solid, liquid or a gas The properties of matter can change.
- Heat, light, and sound are forms of energy.
- Magnets attract some objects and repel others.

#### Knowledge and Skills (SWBAT embedded course proficiencies)

- Classify matter into solids, liquids and gasses by their properties.
- Measure the mass of different objects.
- Measure and compare volumes of liquid.
- Investigate the changes of matter. (e.g. cold and heat)
- Identify and demonstrate how some solids can melt into liquids.
- Identify heat, light, and sound as forms of energy.
- Observe and demonstrate how magnets can move objects without touching them.
- Identify magnets uses in the world around us.

## **Stage 2: Evidence of Understanding, Learning Objectives and Expectations**

Benchmarks (embedded student proficiencies)

Assessment Methods (formative, summative, other evidence and/or student self-assessment)

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- Whole group and small group discussions
- Student reflections using Self-Check assignments and science notebooks
- In-class assessments
- Small center supplemental activities
- Read/Write/Share assignments
- Lab exploration

## **Stage 3: Learning Plan**

Evidence of Engaging Students

- Students will be engaged through:
  - large and small group discussions
  - allowing students to revise, rethink, and refine their understanding of covered topics.

Evidence of Differentiation

- Differentiation will be provided through:
  - Written, visual, auditory, and hands-on activities to meet all learning styles.
  - Students will be provided with individualized instruction as needed.
  - Introduction of new vocabulary words will help students express their ideas, opinions, and feelings

Integration of 21<sup>st</sup> Century Skills

- In this Unit, students will practice the 21<sup>st</sup> century skills of Communication and Collaboration

Integration of 21<sup>st</sup> Century Learning

- We focus on many Life and Career skills by supporting students' interactions with peers and teachers throughout the school day.

## **Time Allotment**

- 22 Days inclusive of assessment

## **Resources**

- HMH Science Fusion text
- Read Alouds-trade books
- HMH Science Fusions leveled readers
- Bookflix,
- Smartboard Interactive Lessons-teacher created and HMH Science Fusions
- Scholastic magazine Science Spin and Scholastic Let's Find Out
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<https://www.lisd.org/technology/itswebs/elem/curr/science/2sciwebsites.htm>



## **New Jersey Student Learning Standards**

<http://www.state.nj.us/education/cccs/>

### **Integration of 21<sup>st</sup> Century Theme(s)**

The following websites are sources for the following 21<sup>st</sup> Century Themes and Skills: <http://www.nj.gov/education/code/current/title6a/chap8.pdf>

<http://www.p21.org/about-us/p21-framework> .

<http://www.state.nj.us/education/cccs/standards/9/index.html>

### **21st Century Interdisciplinary Themes (into core subjects)**

- Global Awareness
- Financial, Economic, Business and Entrepreneurial Literacy
- Civic Literacy
- Health Literacy
- Environmental Literacy

### **Learning and Innovation Skills**

- Creativity and Innovation
- Critical Thinking and Problem Solving
- Communication and Collaboration

### **Information, Media and Technology Skills**

- Information Literacy
- Media Literacy
- ICT (Information, Communications and Technology) Literacy

### **Life and Career Skills**

- Flexibility and Adaptability
- Initiative and Self-Direction
- Social and Cross-Cultural Skills
- Productivity and Accountability
- Leadership and Responsibility

#### **Integration of Digital Tools**

- Classroom computers/laptops
- Technology Lab
- FM system
- Other software programs