

Physical Science

FIRST 9 WEEKS

Big Idea: Properties of Matter

Inquiry Questions

Science:

- ❖ **Properties of Matter (Page 2A)**
 - Lesson 1 How do we describe matter?
 - Lesson 2 What are the properties of solids?
 - Lesson 3 What are the properties of liquids and gases?
- ❖ **Changes to Matter (Page 60A)**
 - Lesson 1 How Can Matter Be Arranged in Different Ways
 - Lesson 2 What Happens When You Mix Matter Together?
 - Lesson 3 How Do Cooling and Heating Affect Matter?

Technology/Engineering:

- How is water reused?
- How does technology help to recycle materials?

Mathematics:

- How can time help in collecting data?

Social Studies:

-

Content Area

Grade Level Standards

Science

- 1.PS.2** Predict and experiment with methods (sieving, evaporation) to separate solids and liquids based on their physical properties.
- 2.PS.1** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
- 2.PS.2** Predict the result of combining solids and liquids in pairs. Mix, observe, gather, record, and discuss evidence of whether the result may have different properties than the original materials.

Big Idea: Properties of Matter

2.PS.3 Construct an argument with evidence that some changes caused by heating and cooling can be reversed and some cannot.

2.PS.4 Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.

Technology/Engineering 5.A: Some materials can be reused and/or recycled.

Mathematics 2.MD.7: Tell and write time from analog and digital clocks to the nearest 5 minutes using AM and PM.

Social Studies**ELA****Reading: Informational Text**

CCSS.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.

CCSS.ELA-Literacy.RI.2.2: Identify the main topic of a multi-paragraph text as well as the focus of specific paragraphs within the text.

CCSS.ELA-Literacy.RI.2.3: Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.

CCSS.ELA-Literacy.RI.2.4: Determine the meaning of words and phrases in a text relevant to a *grade 2 topic or subject area*.

CCSS.ELA-Literacy.RI.2.5: Know and use various text features (e.g.: captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information in a text efficiently.

CCSS.ELA-Literacy.RI.2.6: Identify the main purpose of a text, including what the author wants to answer, explain, or describe.

CCSS.ELA-Literacy.RI.2.7: Explain how specific images (e.g.: a diagram showing how a machine works) contribute to and clarify a text.

CCSS.ELA-Literacy.RI.2.8: Describe how reasons support specific points the author makes in a text.

CCSS.ELA-Literacy.RI.2.9: Compare and contrast the most important points presented by two texts on the same topic.

CCSS.ELA-Literacy.RI.2.10: By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 2-3 text complexity band proficiently, with scaffolding as needed at the high end of the range.

WRITING

CCSS.ELA-Literacy.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.

CCSS.ELA-Literacy.W.2.2: Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.

CCSS.ELA-Literacy.W.2.3: Write narratives in which they recount a well-elaborated event or short sequence of events, include details to describe actions, thoughts, and feelings, use temporal words to signal event order, and provide a sense of closure.

CCSS.ELA-Literacy.W.2.4: Begins in grade 3

CCSS.ELA-Literacy.W.2.5: With guidance and support from adults and peers, focus on a topic and strengthen writing as needed by revising and editing.

CCSS.ELA-Literacy.W.2.6: With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers.

Science Process Standards

Science Process Standards

Nature of Science

- Use a scientific notebook to record predictions, questions and observations about data with pictures, numbers or in words.
- Conduct investigations that may happen over time as a class, in small groups, or independently.
- Generate questions and make observations about natural processes. Make predictions based on observations.
- Discuss observations with peers and be able to support your conclusion with evidence.
- Make and use simple equipment and tools to gather data and extend the senses.
- Recognize a fair test.

Design Process

- Identify a need or problem to be solved.
- Document the design throughout the entire design process.
- Brainstorm potential solutions.
- Select a solution to the need or problem.
- Select the materials to develop a solution.
- Create the solution.
- Evaluate and test how well the solution meets the goal.
- Communicate the solution with drawings or prototypes.
- Communicate how to improve the solution.

Standards for Mathematical Practice

Mathematical Practices

- MP.1. Make sense of problems and persevere in solving them.
- MP.2. Reason abstractly and quantitatively.
- MP. 3 Construct viable arguments and critique the reasoning of others.
- MP.4. Model with mathematics.
- MP.5. Use appropriate tools strategically.
- MP.6. Attend to precision.
- MP.7 Look for and make use of structure.
- MP. 8 Look for and express regularity in repeated reasoning.

Big Idea: Properties of Matter

CCSS.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).

CCSS.ELA-Literacy.W.2.8: Recall information from experiences or gather information from provided sources to answer a question.

Plan of Work

Common Misconceptions

What misconceptions might students have with these ideas?

- Water disappears when it evaporates.
- Cold cups of liquid “sweat” (rather than recognizing that it’s condensation).
- Steam is hot air.
- The water cycle involves only freezing and melting of water.
- Water cycle only includes rain and snow.
- Water runs out (may not realize the water is recycled over and over).
- Liquids are something you drink.
- Only water can melt, boil, or freeze.
- Air is not a gas.
- Gas is a fart.
- Gases are invisible.
- Gas is only for a car (gasoline). Also may think gas is a liquid as a result.
- Solids are heavy and hard.

Suggested Activities

- Sinking and floating with different objects.
- Using different shaped bubble wands to see if it changes the shape of a bubble. Students use pipe cleaners to make own shape and test them out.
- Use paintbrushes and water to “paint” a picture outside on the sidewalk. Use chalk to draw around the water picture. Come back out in 20 minutes or so to see that the water of your picture has “disappeared” (evaporated).
- Watercolor painting to show evaporation
- Observe an ice cube melting – record illustrations and written observations before, during, after. Record time it started, at check during, and after. Could write out a sequencing written prompt describing observations.
- “Cloud in a cup”: use a clear cup half-full of water, put a mound of shaving cream on top as the “cloud”. Use blue food coloring to put drops on top of the shaving cream. Eventually the “clouds” will get so full of “condensation” that they will drop “precipitation” (food coloring drips down into the water) -> look on Pinterest
- Use tea kettle, hot plate, electric kettle to show water vapor.
- Solids, liquids, gas sort -> create a flipbook
- Balloon Exploration: A has air in it (gas), B has water in it (liquid), C has water frozen in it (solid). Students use senses to make observations and predict what is inside based on knowledge of properties of matter. Then can break open and discuss findings.

STEM Integrated Concepts | 2nd Grade

Suggested Vocabulary	solid, liquid, gas, property, matter, water cycle, evaporation, condensation, precipitation, float, mass, pattern, volume, sink, assemble, disassemble, freeze, physical change, chemical change, dissolve, heat, solution, condense, evaporate, mixture, temperature
Resources	http://www.abpischools.org.uk/page/modules/solids-liquids-gases/slg2.cfm http://www.sciencekids.co.nz/gamesactivities.html http://fitkidsclub.blogspot.com/2012/06/clubhouse-truth-preschool-science.html http://www.brainpopjr.com/ - lots of great, short videos about properties of matter http://www.discoveryeducation.com/ http://havefunteaching.com/songs/science-songs/water-cycle-song/ http://www.sciencea-z.com/ http://www.readinga-z.com/
Assessment	
Type of Assessment	Example
<input checked="" type="checkbox"/> Observation	Listen for terminology used during experiments, participation, etc.
<input type="checkbox"/> Oral Questioning	
<input checked="" type="checkbox"/> Exit Slip	Solids, liquids, gases sort
<input checked="" type="checkbox"/> Journal	Science notebook recording observations of ice cube melting, times, sink/float experiment, etc.
<input checked="" type="checkbox"/> Graphic Organizers	Visual representation of the particles of matter with in solids, liquids, and gases
<input type="checkbox"/> Self-Assessment	
<input type="checkbox"/> Writing Prompt	
<input type="checkbox"/> Presentation	
<input type="checkbox"/> Electronic media	
<input checked="" type="checkbox"/> Think Pair Share	Compare the results of the various experiments
<input type="checkbox"/> Whiteboards	
<input checked="" type="checkbox"/> Experiment/projects	Students reflect and discuss what happens to water when it is heated or cooled in reference to the ice cube experiment; also could be used for any of the experiments (ie: balloons)
<input type="checkbox"/> Quiz	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	

Earth and Space Science

SECOND NINE WEEKS – PART 1 (Not covered in textbook)

Big Idea: Earth/Sun/Moon Relationships

Inquiry Questions

Science:

- Why does the shape of the moon change from day to day?
- Why does our shadow change during the day?
- What observations can we make about the sun, moon, and stars?

Technology/Engineering:

- How is Daylight Savings Time beneficial in Indiana?

Mathematics:

- What fractions can you create using the phases of the moon?
- How does your shadow change in length throughout the day?

Social Studies:

- What can you observe by creating a monthly moon calendar?
- In what directions do the sun and moon rise or set?

Content Area

Grade Level Standards

Science

Not covered in textbook.

2.SEPS2.6 Scientists and engineers use their results from the investigation in constructing descriptions and explanations, citing the interpretation of data, connecting the investigation to how the natural and designed world(s) work. They construct or design logical coherent explanations or solutions of phenomena that incorporate their understanding of science and/or engineering or a model that represents it, and are consistent with the available evidence.

Technology/Engineering

2A: Some systems are found in nature, and some are made by humans. (for example; earth, moon, sun is a system found in nature. Daylight Savings Time is a human made system based on earth, moon, and sun natural system)
 10.A: Asking questions and making observations helps a person figure out how things work.
 12.A: Discover how things work.

Big Idea: Earth/Sun/Moon Relationships**Mathematics**

2.G.3: Partition circles and rectangles into two, three, or four equal shares. Describe the shares using the words halves, thirds, half of, a third of, etc. Describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.

2.MD.1: Measure the length of an object by selecting and using appropriate tools, such as rulers, yardsticks, meter sticks, and measuring tapes.

2.MD.2: Measure the length of an object twice using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.

2.MD.3: Estimate lengths using units of inches, feet, centimeters, and meters.

Social Studies

2.1.6: Create and maintain a calendar of important school days, holidays, and community events.

2.3.1: Use a compass rose to identify cardinal and intermediate directions and to locate places on maps and places in the classroom, school, and in the community.

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Big Idea: Earth/Sun/Moon Relationships

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Science Process Standards

Standards for Mathematical Practice

Science Process Standards**Nature of Science**

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- Discuss observations with peers and be able to support your conclusion with evidence.
- Make and use simple equipment and tools to gather data and extend the senses.
- Recognize a fair test.

Design Process

- Identify a need or problem to be solved.
- Document the design throughout the entire design process.
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Mathematical Practices

- MP.1. Make sense of problems and persevere in solving them.
- MP.2. Reason abstractly and quantitatively.
- MP. 3 Construct viable arguments and critique the reasoning of others.
- MP.4. Model with mathematics.
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- MP.6. Attend to precision.
- MP.7 Look for and make use of structure.
- MP. 8 Look for and express regularity in repeated reasoning.

Plan of Work

Common Misconceptions

What misconceptions might students have with these ideas?

- The sun rotates around the Earth.
- The moon makes its own light.
- The moon is only visible at night./The sun disappears at night.
- The Earth is larger than the sun.
- The moon grows and shrinks throughout the month. (They may not understand the whole moon is always there, just that some parts are in shadow throughout the month.)
- When it's hot, the sun is closer to the Earth.
- It's nighttime for everybody at the same time on Earth.
- We don't move because we can't feel Earth spinning. (Everything else revolves around us.)

Suggested Activities

- Create a phases of the moon calendar over a month. Write what you noticed about how it's changed.
- Use Oreos or other foods to represent the phases of the moon.
- Use bodies/balls and demonstrate physically how the Earth, moon, and sun work together. (Big project: Work in groups to create mobiles or other 3-D depiction of them.)
- Trace shadows outside using chalk a few times throughout the day and measure the length of them. Record, write out results, and discuss how it changed over time.
- Make a sun observer or moon observer to assist with observations.

Suggested Vocabulary

phases, cycle, length, measurement tools, ruler, yardstick, meter stick, measuring tape, estimate lengths, inches, centimeters, feet, meters, equal shares, halves, thirds, fourths (and quarters)

Resources

<http://www.moonconnection.com/> - Lunar calendars, real-life images, etc
<http://www.fossweb.com/modules3-6/SunMoonandStars/> - Various activities
<http://www.youtube.com/watch?v=79M2ISVziY4> - Phases of the Moon Rap
http://www.harcourtschool.com/activity/moon_phases/index.html - Phases of the Moon Simulation
http://www.noao.edu/education/phases/phases_demo.html - Phases of the Moon video demo
<http://www.sciencea-z.com/>
<http://www.readinga-z.com/>
<http://www.brainpopjr.com/> - Short, informational fun videos

Assessment

Type of Assessment

Example

STEM Integrated Concepts | 2nd Grade

<input type="checkbox"/> Observation	
<input type="checkbox"/> Oral Questioning	
<input checked="" type="checkbox"/> Exit Slip	Check understanding of concepts taught in daily lessons (ie: What happens to the sun at nighttime?)
<input checked="" type="checkbox"/> Journal	Monthly moon calendar
<input checked="" type="checkbox"/> Graphic Organizers	Recording shadows at different times through day and length on a graphic organizer
<input type="checkbox"/> Self-Assessment	
<input type="checkbox"/> Writing Prompt	
<input checked="" type="checkbox"/> Presentation	Could present 3-D mobile representations of Sun, moon, and stars
<input type="checkbox"/> Electronic media	
<input checked="" type="checkbox"/> Think Pair Share	Observations of moon calendar, how shadows changed, etc
<input type="checkbox"/> Whiteboards	
<input checked="" type="checkbox"/> Experiment/projects	Shadow experiment -> explore how it changes and record in organizer and/or scientific journal
<input type="checkbox"/> Quiz	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	

FORCES AND MOTION**SECOND NINE WEEKS – PART 2 (Not covered in textbook)****Big Idea:****Inquiry Questions**

Science:

- What are the different ways objects can move?
- In what ways can you change the motion and force of an object?
- How do gravity and magnetism affect different objects?

Technology/Engineering:

- How can you design an object to make it move faster/slower?
- What do you observe about how objects change motion?

Mathematics:

- Why does skip counting help you measure how far objects travel?
- How can you use addition and subtraction in word problems comparing how far objects travel?

Social Studies:

Content Area**Grade Level Standards****Science**

- 2.SEPS2.6** Scientists and engineers use their results from the investigation in constructing descriptions and explanations, citing the interpretation of data, connecting the investigation to how the natural and designed world(s) work. They construct or design logical coherent explanations or solutions of phenomena that incorporate their understanding of science and/or engineering or a model that represents it, and are consistent with the available evidence.
- 2.ESS.1** Record detailed weather observations, including cloud cover, cloud type, and type of precipitation on a daily basis over a period of weeks and correlate observations to the time of year. Chart and graph collected data.
- 2.ESS.2** Investigate the severe weather of the region and its impact on the community, looking at forecasting to prepare for, and respond to, severe weather.
- 2.ESS.3** Investigate how wind or water change the shape of the land and design solutions for prevention.

Big Idea:	
	<p>2.ESS.4 Obtain information to identify where water is found on Earth and that it can be solid or liquid.</p>
Technology/Engineering	<p>8.A: Everyone can design solutions to a problem. 8.B: Design is a creative process. 10.A: Asking questions and making observations help a person to figure out how things work. 12.A: Discover how things work.</p>
Mathematics	<p>2.NBT.2: Count within 1000; skip count by 5s, 10s, and 100s. 2.MD.5: Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem. 2.MD.3: Estimate lengths using units of inches, feet, centimeters, and meters.</p>
Social Studies	
ELA	<p>Reading: Informational Text CCSS.ELA-Literacy.RI.2.1: Ask and answer such questions as <i>who, what, where, when, why, and how</i> to demonstrate understanding of key details in a text. CCSS.ELA-Literacy.RI.2.3: Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text CCSS.ELA-Literacy.RI.2.4: Determine the meaning of words and phrases in a text relevant to a <i>grade 2 topic or subject area</i>. CCSS.ELA-Literacy.RI.2.5: Know and use various text features (e.g.: captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information in a text efficiently. CCSS.ELA-Literacy.RI.2.7: Explain how specific images (e.g.: a diagram showing how a machine works) contribute to and clarify a text. CCSS.ELA-Literacy.RI.2.9: Compare and contrast the most important points presented by two texts on the same topic. CCSS.ELA-Literacy.RI.2.10: By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 2-3 text complexity band proficiently, with scaffolding as needed at the high end of the range.</p> <p>WRITING CCSS.ELA-Literacy.W.2.2: Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section. CCSS.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). CCSS.ELA-Literacy.W.2.8: Recall information from experiences or gather information from provided sources to answer a question.</p>

Science Process Standards

Standards for Mathematical Practice

Science Process Standards**Nature of Science**

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Plan of Work

Common Misconceptions

What misconceptions might students have with these ideas?

- Objects can only move in one direction.
- Objects only move on their own.
- Gravity does not work through objects.
- Objects stop moving on their own.
- Magnets don't work through other objects (ie: through a table).
- Objects only attract or repel.
- Motion is only when something is moving or not moving.
- Gravity is a way to keep things still.
- Gravity only exists in some places.
- Objects fall at different rates due to weight.

Suggested Activities

- Use ramps to see which objects travel faster or further. Estimate and then measure distance traveled.
- Build paper airplanes and see the length they travel (based on force, gravity, etc).
- Drop a unifix cube onto tables (or other solid), through the air, and into a cup of water to show that solids stop motion, liquid slows it down, and air doesn't affect it.
- Use a balance to put different objects on either side (paper clips, cubes, other manipulatives) to learn how to balance the forces of gravity on either side.
- Drop two objects at the same time from the same height to see which hits the ground first. Compare and contrast in regards to shape, size, weight, etc. (Hint: All should hit at the same time, except depending on the shape.)
- Build a racecar (can buy kits from craft stores) and students race them on ramps.
- Compare/contrast two objects' force on gravity (based off of another activity) or elsewhere.
- Use magnets to see whether you can move a paperclip when the magnet is placed between an object. (For example, can you move a paperclip across a table when the magnet is being used from underneath the table?)

Suggested Vocabulary

force, motion, gravity, magnetism, attract, repel

Resources	http://firstschoolyears.com/science/forces/forces.html http://www.cape.k12.mo.us/blanchard/hicks/news%20pages/scienceforce.htm - many lessons on different force/motion activities http://www.uen.org/Lessonplan/preview.cgi?LPid=28207 - Gravity lesson http://www.teachingskidsbooks.com/k-2nd-grade/force-motion-and-gravity - Read aloud ideas Magic School Bus video – “Plays Ball” http://www1.teachertube.com/viewVideo.php?video_id=126336&title=Bill_Nye_on_Gravity - Bill Nye Gravity video http://www.sciencea-z.com/ http://www.readinga-z.com/ http://www.brainpopjr.com/ http://www.discoveryeducation.com/
Assessment	
Type of Assessment	Example
<input checked="" type="checkbox"/> Observation	During experiments
<input checked="" type="checkbox"/> Oral Questioning	Informal questioning during experiments
<input checked="" type="checkbox"/> Exit Slip	“Today I learned _____ about gravity.” or “What did you notice about _____?”
<input checked="" type="checkbox"/> Journal	Recording distance
<input checked="" type="checkbox"/> Graphic Organizers	Venn diagrams, T-charts, etc
<input checked="" type="checkbox"/> Self-Assessment	How could you have improved your race car if you were to build it again? (or other question about an experiment/item they built)
<input type="checkbox"/> Writing Prompt	
<input type="checkbox"/> Presentation	
<input type="checkbox"/> Electronic media	
<input checked="" type="checkbox"/> Think Pair Share	“What did you notice happened to the objects when we dropped them?”
<input type="checkbox"/> Whiteboards	
<input type="checkbox"/> Experiment/projects	
<input checked="" type="checkbox"/> Quiz	Give a quiz over what happens when you push an object, drop it into water, etc. (everything they learned...could create drawings to demonstration motion of objects)
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	

EARTH'S SURFACE**THIRD NINE WEEKS****Big Idea:****Inquiry Questions**

Science:

- ❖ **Earth's Surface (Page 106A)**
 - **Lesson 1 How can we describe Earth's surface?**
 - **Lesson 2 Where are Earth's oceans?**
 - **Where is Earth's fresh water?**
- ❖ **Earth's Surface Change (Page 150A)**
 - **Lesson 1 How do wind and water change Earth's surface?**
 - **Lesson 2 How does Earth's surface change quickly?**
 - **Lesson 3 How can people slow the changes to Earth's surface?**

Technology/Engineering:

Mathematics:

Social Studies:

Content Area Grade Level Standards

Science	<p>2.ESS.1 Record detailed weather observations, including cloud cover, cloud type, and type of precipitation on a daily basis over a period of weeks and correlate observations to the time of year. Chart and graph collected data.</p> <p>2.ESS.2 Investigate the severe weather of the region and its impact on the community, looking at forecasting to prepare for, and respond to, severe weather.</p> <p>2.ESS.3 Investigate how wind or water change the shape of the land and design solutions for prevention.</p> <p>2.ESS.4 Obtain information to identify where water is found on Earth and that it can be solid or liquid.</p>
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Science Process Standards**Science Process Standards****Nature of Science**

- Make predictions and formulate testable questions.
- Design a fair test.
- Plan and carry out investigations—often over a period of several lessons—as a class, in small groups or independently.
- Perform investigations using appropriate tools and technologies that will extend the senses.
- Use measurement skills and apply appropriate units when collecting data.
- Test predictions with multiple trials.
- Keep accurate records in a notebook during investigations and communicate findings to others using graphs, charts, maps and models through oral and written reports.
- Identify simple patterns in data and propose explanations to account for the patterns.
- Compare the results of an investigation with the prediction.

Design Process

- Identify a need or problem to be solved.
- Brainstorm potential solutions.
- Document the design throughout the entire design process.
- Select a solution to the need or problem.
- Select the most appropriate materials to develop a solution that will meet the need.
- Create the solution through a prototype.
- Test and evaluate how well the solution meets the goal.
- Evaluate and test the design using measurement.

Standards for Mathematical Practice**Mathematical Practices**

- MP.1. Make sense of problems and persevere in solving them.**
- MP.2. Reason abstractly and quantitatively.**
- MP.3 Construct viable arguments and critique the reasoning of others.**
- MP.4. Model with mathematics.**
- MP.5. Use appropriate tools strategically.**
- MP.6. Attend to precision.**
- MP.7 Look for and make use of structure.**
- MP.8 Look for and express regularity in repeated reasoning.**

Big Idea:

ELA

<u>Plan of Work</u>	
Common Misconceptions	
What misconceptions might students have with these ideas?	
Suggested Activities	
Suggested Vocabulary	continent, fresh water, glacier, globe, island, land form, map, mountain, ocean, river, salt water, stream, coast, earth quake, erosion, flood, land slide, natural resource, rock, sand, soil, volcano, weathering, wind break
Resources	Earth's Surface Weather erosion experiments with Skittles Earth's Oceans National Geographic Earth's Freshwater http://www.watchknowlearn.org/Video.aspx?VideoID=13256 http://www.watchknowlearn.org/Video.aspx?VideoID=5042&CategoryID=1050 https://spweb.tbaisd.k12.mi.us/sites/home/instructionalresources/science/pk8resources/2nd%20Grade/2nd%20Grade%20Unit%203%20Earth%27s%20Surface%20Features%20-%20Landforms.doc http://beyondpenguins.ehe.osu.edu/issue/earths-changing-surface/hands-on-science-and-literacy-activities-about-erosion-volcanoes-and-earthquakes
Assessment	
Type of Assessment	Example
<input checked="" type="checkbox"/> Observation	Listening for terminology used during experiments, participation, etc.
<input checked="" type="checkbox"/> Oral Questioning	Answering inquiry questions
<input type="checkbox"/> Exit Slip	
<input type="checkbox"/> Journal	

<input type="checkbox"/> Graphic Organizers	
<input type="checkbox"/> Self-Assessment	
<input type="checkbox"/> Writing Prompt	
<input type="checkbox"/> Presentation	
<input type="checkbox"/> Electronic media	
<input checked="" type="checkbox"/> Think Pair Share	Observation and discussion of results of experiments
<input type="checkbox"/> Whiteboards	
<input type="checkbox"/> Experiment/projects	
<input checked="" type="checkbox"/> Quiz	End of module evaluate pages

LIFE SCIENCE

FOURTH NINE WEEKS

Big Idea: Plant/Animal Structures and Functions

Inquiry Questions

Science:

- ❖ **Living Things in Habitats (Page 194A)**
 - Lesson 1 What is a habitat?
 - Lesson 2 What lives in forests and grasslands?
 - Lesson 3 What lives in water habitats:
 - Lesson 4 What lives in hot and cold deserts?
- ❖ **Plants and their Needs (Page 250A)**
 - Lesson 1 Why do plants need water?
 - Lesson 2 Why do plants need light?
 - Lesson 3 How do plants get help making new plants?

Technology/Engineering:

- How has the use of technology and agriculture made it possible for food to be available year round?

Mathematics:

- What tool can we use to chart growth of plants and animals?

Social Studies:

- Where in your community can you observe plant and animals' life cycles in their habitats?

Content Area

Grade Level Standards

Science

2.LS.1 Determine patterns and behavior (adaptations) of parents and offspring which help offspring to survive.
2.LS.2 Compare and contrast details of body plans and structures within the life cycles of plants and animals.
2.LS.3 Classify living organisms according to variations in specific physical features (i.e. body coverings, appendages) and describe how those features may provide an advantage for survival in different environments.

Technology/Engineering

15 A: The use of technologies in agriculture makes it possible for food to be available year round and to conserve resources.
 15 B: There are many different tools necessary to control and make up the parts of an ecosystem.

Big Idea: Plant/Animal Structures and Functions**Mathematics**

2.MD.10: Draw a picture graph and 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.

Social Studies

2.3.4: On a map, identify physical features of the local community.

ELA**Reading: Informational Text**

CCSS.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.

CCSS.ELA-Literacy.RI.2.2: Identify the main topic of a multi-paragraph text as well as the focus of specific paragraphs within the text.

CCSS.ELA-Literacy.RI.2.3: Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text

CCSS.ELA-Literacy.RI.2.4: Determine the meaning of words and phrases in a text relevant to a *grade 2 topic or subject area*.

CCSS.ELA-Literacy.RI.2.5: Know and use various text features (e.g.: captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information in a text efficiently.

CCSS.ELA-Literacy.RI.2.6: Identify the main purpose of a text, including what the author wants to answer, explain, or describe.

CCSS.ELA-Literacy.RI.2.7: Explain how specific images (e.g.: a diagram showing how a machine works) contribute to and clarify a text.

CCSS.ELA-Literacy.RI.2.8: Describe how reasons support specific points the author makes in a text.

CCSS.ELA-Literacy.RI.2.9: Compare and contrast the most important points presented by two texts on the same topic.

CCSS.ELA-Literacy.RI.2.10: By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 2-3 text complexity band proficiently, with scaffolding as needed at the high end of the range.

WRITING

CCSS.ELA-Literacy.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.

CCSS.ELA-Literacy.W.2.2: Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.

CCSS.ELA-Literacy.W.2.3: Write narratives in which they recount a well-elaborated event or short sequence of events, include details to describe actions, thoughts, and feelings, use temporal words to signal event order, and provide a sense of closure.

CCSS.ELA-Literacy.W.2.4: Begins in grade 3

CCSS.ELA-Literacy.W.2.5: With guidance and support from adults and peers, focus on a topic and strengthen writing as needed by revising and editing.

CCSS.ELA-Literacy.W.2.6: With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers.

CCSS.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).

CCSS.ELA-Literacy.W.2.8: Recall information from experiences or gather information from provided sources to answer a question.

CCSS.ELA-Literacy.W.2.9: Begins in grade 4

CCSS.ELA-Literacy.W.2.10: Begins in grade 3

Science Process Standards

Standards for Mathematical Practice

Science Process Standards**Nature of Science**

- Use a scientific notebook to record predictions, questions and observations about data with pictures, numbers or in words.
- Conduct investigations that may happen over time as a class, in small groups, or independently.
- Generate questions and make observations about natural processes. Make predictions based on observations.
- Discuss observations with peers and be able to support your conclusion with evidence.
- Make and use simple equipment and tools to gather data and extend the senses.
- Recognize a fair test.

Design Process

- Identify a need or problem to be solved.
- Document the design throughout the entire design process.
- Brainstorm potential solutions.
- Select a solution to the need or problem.
- Select the materials to develop a solution.
- Create the solution.
- Evaluate and test how well the solution meets the goal.
- Communicate the solution with drawings or prototypes.
- Communicate how to improve the solution.

Mathematical Practices

- MP.1. Make sense of problems and persevere in solving them.
- MP.2. Reason abstractly and quantitatively.
- MP. 3 Construct viable arguments and critique the reasoning of others.
- MP.4. Model with mathematics.
- MP.5. Use appropriate tools strategically.
- MP.6. Attend to precision.
- MP.7 Look for and make use of structure.
- MP. 8 Look for and express regularity in repeated reasoning.

Plan of Work

Common Misconceptions

What misconceptions might students have with these ideas?

- Plants need soil to grow.
- Seeds come from the ground.
- Animals can live anywhere.
- All animals are born from eggs.
- Humans are not animals.
- Only animals can breathe.
- All living things have the same life cycle.

Suggested Activities

- Buy caterpillars from www.insectlore.com and observe the life cycle watching the growth. Graph days in the different stages, scientific notebooking, etc.
- Use graphic organizers to compare life cycles (ie: grasshopper vs. butterfly)
- Take students to the zoo or a nature park with scientific notebooks to make observations.
- Grow lima bean seeds in Ziploc bags with wet paper towels and tape to the window. Use scientific notebooks to record growth, make graphs, compare plants grown in different areas, etc.
- Create a 3-D model of a plant, animal, or life cycle. Could also include habitat and then share with other classes.
- Draw a map to show different habitats for plants/animals in your local community
- Build a backbone to discuss vertebrates and invertebrates.
- Create a new animal to make a 3-D model (or drawing)—choose 2 features of one animal and then choose 2 other features to “improve” it and help it live in a new habitat.
- Research an animal and write a report on it, covering all aspects of life cycles.
- Write a comparison report on two different animals, again comparing their life cycles.
- Diagram a plant and label its features. (could also create a foldable)

Suggested Vocabulary

life cycle, organism, adapt, features, classify, Arctic, desert, food chain, forest, grassland, habitat, ocean, pond, predator, prey, shelter, dispersal, flower, fruit, germinate, leaves, nutrient, pollen, pollination, root, seed, seedling, stem

Resources	http://www.primaryresources.co.uk/science/science2c.htm http://www.saps.org.uk/primary/teaching-resources http://www.superteacherworksheets.com/ - has foldable booklets on several plant and animal life cycles http://kids.nationalgeographic.com/kids/ http://teacher.scholastic.com/activities/explorer/ecosystems/be_an_explorer/map/form_caterpillars.htm http://www.harcourtschool.com/activity/animalneeds/ http://www.sciencea-z.com/ http://www.readinga-z.com/ http://www.brainpopjr.com/ http://www.discoveryeducation.com/
Assessment	
Type of Assessment	Example
<input checked="" type="checkbox"/> Observation	How students use ruler correctly when measuring plants; listen for language they are using
<input type="checkbox"/> Oral Questioning	
<input type="checkbox"/> Exit Slip	
<input checked="" type="checkbox"/> Journal	Assess students' work in scientific notebooks
<input checked="" type="checkbox"/> Graphic Organizers	Compare/contrast life cycles of 2 different plants or animals
<input type="checkbox"/> Self-Assessment	
<input type="checkbox"/> Writing Prompt	
<input checked="" type="checkbox"/> Presentation	Present research reports and/or 3-D models of life cycle/animal/plant/habitat, etc
<input type="checkbox"/> Electronic media	
<input type="checkbox"/> Think Pair Share	
<input type="checkbox"/> Whiteboards	
<input checked="" type="checkbox"/> Experiment/projects	Growing of caterpillars, plants, etc
<input checked="" type="checkbox"/> Quiz	Cloze assessment with life cycle steps
<input checked="" type="checkbox"/> Research Report	Students do research and write report on chosen animal
<input type="checkbox"/>	
<input type="checkbox"/>	