

STAGE 1 – DESIRED RESULTS

Unit Title: Physical Science: Matter and its Interactions

Grade Level: Second

Length/Timing of Unit:

Designer(s): Pascack Valley Regional Science Committee

Science State standards addressed (verbatim):

Students who demonstrate understanding can:

- 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.]

Connections to Common Core Standards (verbatim):

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)

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 (3-4) in provocative, student-friendly language:

- EQ1. How can different materials be compared to one another?
- EQ2. How can we determine if a material is appropriate?
- EQ3. What makes a material appropriate for multiple objects?
- EQ4. Why can some materials be changed by heating or cooling and others cannot?

Big Ideas/ Enduring Understandings: *Students will understand that...*

EQ1:

- Different kinds of materials can be compared and classified by color, texture, hardness, and flexibility.

EQ2:

- Not all materials are appropriate for the same purpose because of their properties (strength, flexibility, hardness, texture, and absorbency).

EQ3:

- By observing an object, you are able to see other uses for its pieces.

EQ4:

- Some materials can be changed by heating or cooling, but other changes are irreversible.

A list of factual knowledge to be taught – *Students will know...*

EQ1:

- Three types of matter (solid, liquid, gas)
- Properties of solids, liquids, and gases

EQ2:

- Properties of solids, liquids, and gases
- Objects can be disassembled into smaller pieces and made into a new object

EQ3:

- A set of pieces can be used for various purposes

EQ4:

- Heating and cooling effects matter

A list of skills to be taught or reinforced (including habits of mind) – *Students will be able to...*

- Planning and conducting an investigation to classify and describe different materials.
- Examine an object to determine its best purpose based on the properties of the matter.
- Observe an object to see if smaller pieces can be used for other purposes.
- Observe and argue with evidence why a substance can be changed, sometimes irreversibly, due to heating and cooling.

STAGE 2 – SAMPLE ASSESSMENT

Assessment # 1:

Goal: Evaluate and test given materials to determine which are best suited to construct a model of a bridge.

Role: You are an engineer asked to build a bridge that can withhold X amount of weight and be X inches long.

Audience: People planning on traveling across the bridge.

Situation: You have been asked to create a sustainable bridge using supplied materials.

Product/Performance and Purpose:

The students will work in groups and examine supplied materials. The students will then determine which materials can be used to make a bridge that can hold at least X amount of weight (in pennies). Before the bridge is designed, the students must evaluate the materials to determine which would be best to hold X amount of weight and be X inches long. After evaluating each material they must then create a t-chart listing the object's pros and cons regarding the listed parameters. Once the students decide on the best material,

they will then begin designing and building a sustainable bridge.

Standards and Criteria for Success:

The bridge must meet the following criteria (see checklist below):

1. The bridge span must be X inches long.
2. The bridge must be able to hold X amount of weight.
3. It must be designed using only 1 type of material (no mixing of materials). This does not include how the pieces are attached to each other (ex: glue, gumdrops, tape).
4. Each group must have available the pros and cons list for each material, but then present the pros and cons for your selected material.
 - This activity can be extended by continuing to add more weights to determine the strongest bridge, the most aesthetically pleasing, and the longest span.

Assessment # 2:

Goal: Using a set of blocks (wood, cardboard, legos, etc.) construct two different structures.

Role: You are an engineer asked to build a building.

Audience: People on the town planning board.

Situation: You have been asked to create a new school for your town. You must create two design options for the planning board to review.

Product/Performance and Purpose:

The students will work in groups and examine the supplied materials. First, the students will build one model of the school. They will draw a picture to record what they made. Then, they will deconstruct their building and design a different school, using the same pieces. They will draw the second school building design.

Standards and Criteria for Success:

The two schools must meet the following criteria:

1. These structures must be made using the same materials.
2. The students' drawings must include labels of the height and length of each structure.
3. As a class, create a graph comparing the heights and/or lengths of the buildings designed by each group. Discuss results.
 - This activity can be extended by create a Venn diagram comparing/contrasting their two buildings.

Assessment # 3:

Goal: Observe the heating and cooling of materials to show that the effects can be reversed in some cases and permanent in others.

Product/Performance and Purpose:

The students will observe melting ice and cooling of water, as well as, cooking an egg in the classroom (classroom demonstration or video clip). They will make observations and drawings. Students will share their observations in groups. They will work with their group to brainstorm a different substance where the state of matter change can be reversed (ice pop, condensation, candle wax melting, mud) and one where the change cannot be reversed (cake batter, match burning, blending fruit/vegetables into a smoothie). The group will work to construct an argument about their new substances using evidence from previous

experiments and their knowledge about the substance.

STAGE 3 – LEARNING PLAN

Resources:

Videos:

Brain Pop Jr. videos: Solids, Liquids, and Gases and Changing States of Matter

Bill Nye Video #8 Phases of Matter

Scholastic Study Jams: Properties of Matter and Solids, Liquids and Gases

Books:

Change It! Solids, Liquids, Gases and You by Adrienne Mason

Amazing Materials by Sally Hewitt

Matter: Solids, Liquids, and Gases by Mir Tamim Ansary

Mixing and Separating by Chris Oxlade

What is the World Made of? All About Solids, Liquids, and Gases by Kathleen Weidner Zoehfeld

Websites:

<http://archive.fossweb.com/modulesK-2/SolidsandLiquids/activities/changeit.html>

<http://www.scholastic.com/browse/lessonplan.jsp?id=1509>

https://www.teachengineering.org/view_activity.php?url=collection/nyu_/activities/nyu_bridge/nyu_bridge_activity1.xml

Lesson/Activity Ideas:

Journal entry: Matter is the substance that makes up everything. Why is that important to me?

Scavenger hunt around classroom/playground categorizing solids, liquids, and gases. Scavenger hunt at home for homework.

Blow up balloon to demonstrate that gas is matter.

Does the volume of a solid or liquid change when it's placed in different shaped containers? Pour liquids into different shape containers to demonstrate that liquids take the shape of their container. Compare to what happens if you put a solid in different containers.

Brainstorm a list of solids, liquids and gases in a 3 column chart.

Changing states: Fill several ice cube trays with water and add a drop of food coloring to each cube. Freeze the cubes until they're solid, and then place one in a zip-top bag so you have enough for each student to have one bag. Have your second-graders tell you what state of matter the ice cubes show, and then tape the bags to your classroom window. Over the course of the day, have students observe what's happening in the bags. First, the ice cubes will change from a solid to a liquid, and then the liquid will start forming water

vapor, which is a gas.

Use magazines to cut and glue, creating a collage of solids, liquids, and gases.

Optional culminating activities: pop Jiffy Pop, make oobleck, make silly putty, make ice cream

Bridge Assessment Checklist

	Yes	No
1. Bridge is _____ inches long		
2. Bridge holds _____ amount of weight		
3. Bridge is built using only one type of material		
4. Corresponding list of pros and cons for building materials.		
5. Present pros and cons for chosen material		

STAGE 1 – DESIRED RESULTS

Unit Title: Life Science: Ecosystems: Interactions, Energy, and Dynamics

Grade Level: Second

Length/Timing of Unit:

Designer(s): Pascack Valley Regional Science Committee

Science State standards addressed (verbatim):

2-LS2-1 Plan and conduct an investigation to determine if plants need sunlight and water to grow.

[Assessment Boundary: Assessment is limited to testing one variable at a time.]

2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.*

Connections to Common Core Standards (verbatim):

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-LS2-1)

W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-LS2-1)

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)

MP.2 Reason abstractly and quantitatively. (2-LS2-1)

MP.4 Model with mathematics. (2-LS2-1),(2-LS2-2)

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 using information presented in a bar graph. (2-LS2-2)

Essential Questions (3-4) in provocative, student-friendly language:

- EQ1. What do plants need in order to grow and survive?
- EQ2. What role do animals play in plant production?
- EQ3. How can you model the animal's role in dispersing seeds or pollinating plants?

Big Ideas/Enduring Understandings: *Students will understand that...*

EQ1:

- Plants are living things and they have specific needs in order to survive

EQ2:

- There is a relationship between plants and animals
- Animals disperse seeds which enables plants to reproduce

EQ3:

- Technology assists in seed dispersals

A list of factual knowledge to be taught – *Students will know...*

EQ1:

- That living things need nutrients to grow.
- Sunlight and water are essential for plants to grow.

EQ2:

- Some living things need other living things to help them to reproduce.

EQ3:

- Some living things need other living things to help them to reproduce.

A list of skills to be taught or reinforced (including habits of mind) – *Students will be able to...*

- Conduct an experiment to determine why plants need sunlight and water to grow.
- Understand the importance of animals in plant reproduction.
- Design and construct a simple model representing the function of an animal in dispersing or pollinating plants.

STAGE 2 – SAMPLE ASSESSMENT

Assessment #1:

Goal: Investigate the importance of honeybees in agriculture and develop a model that mimics pollination. They will also determine whether plants need sunlight and water to grow.

Role: Farmer

Audience: Members of the agriculture community.

Situation: You are a farmer and there is a shortage of honeybees in the community. You must develop a new system to pollinate the plants.

Product/Performance and Purpose:

With a partner, plant a marigold seed in each of the three provided pots with soil. Seed # 1 must receive water and sunlight. Seed # 2 will receive water, but no sunlight. Seed # 3 will receive sunlight, but no water. You are then to monitor each plant's life cycle. You are to progressively observe the plants and draw, label, and write about each stage of the life cycle. Once the flower(s) has blossomed, brainstorm a list of tools that could be used to transfer pollen. Once each group has selected their tool, they will then test it and determine whether it was successful in picking up pollen from the flower. Write a letter to other farmers in your community explaining your discovery. Tell them how this pollination tool can help them solve the problem of a shortage of bees and the effects the growing conditions had on the plants.

Standards and Criteria for Success:

Each group must submit (see checklist below):

1. A chart displaying the life cycle of their plants. It must include drawings, labels, and a description of each stage for each of the three seeds.
2. A list of possible tools to aid in pollination.
3. A rationale explaining why their tool was successful or not in transferring pollen.
4. After reviewing the class's results with each tool, choose the best one and write a letter persuading farmers to use the pollination tool. Include supporting evidence.

STAGE 3 – LEARNING PLAN

Resources:

Videos:

Brain Pop Jr. Plant Life Cycle, Pollination
Scholastic Study Jams: Photosynthesis, Ecosystems
PBS Learning Media Video: From Seed to Flower (time lapse video)

Books:

A Seed is Sleepy by Dianna Hutts Aston
A Fruit is a Suitcase for Seeds by Jean Richards
Jack's Garden by Henry Cole
How a Seed Grows by Helene Jordan
Magic School Bus Plants Seeds by Joanna Cole
The Dandelion Seed by Joseph Anthony
In a Nutshell by Joseph Anthony
DK Eyewitness Plant by David Burnie
Would You Survive? Animal and Plant by John Townsend
Let's Look at Animal Feet by Wendy Perkins

Websites:

Types of seed dispersal:

http://www2.bgfl.org/bgfl2/custom/resources_ftp/client_ftp/ks2/science/plants_pt2/dispersal.htm

Info on plant life cycles and seed growth, also includes student worksheets:

http://www2.bgfl.org/bgfl2/custom/resources_ftp/client_ftp/ks2/science/plants_pt2/index.htm

Brain Pop Educators- Pollination: <http://www.brainpop.com/educators/community/bp-topic/pollination/>

Pollination <https://www.youtube.com/watch?v=7CdoBCEEpz4>

Plant requirements and reproduction <http://msnucleus.org/membership/html/k-6/lc/index.html>

Slideshow about parts of plant: <http://www.slideshare.net/KathyFiol/plants-3-23948631>

Lesson/Activity Ideas:

Examine a group of seeds. Sort and classify seeds by size, shape, etc. Predict based on their appearance how they are dispersed to a new location.

Examine the seeds from a variety of fruit. Discuss questions: Why do you think some fruits have lots of seeds and some have few (or only one)? What differences are there between the seeds that come from fruits with several seeds and fruits with few seeds? What are the advantages of having lots of seeds compared to advantages of having few seeds?

Activity to compare seed sizes and dispersal methods (Two different ways to disperse seeds, wind dispersal (only useful for small seeds) and fruit dispersal. Explain why plants need to disperse their seeds.) Place two hula-hoops on opposite sides of a center line. The hula hoop represents an area that has optimal conditions for growth (i.e. enough light, water, nutrients from soil). Gather 5 large balls and 30 small balls. Have one person represent wind dispersal and one represent fruit dispersal. Have the two people line up on a center line between the two hula hoops. Give the wind dispersal person 30 small balls (or bean bags) and the fruit dispersal team 5 medicine balls. The balls/bean bags represent the plant's seeds. The fruit person has to carry their seeds between their knees directly into the hoop. Ensure that their seeds are large to illustrate the point. The wind team cannot move from the line. They have to try to throw their seeds into the hula-hoop. After 30 seconds, compare the number of seeds that have succeeded from each method. Talk about which method the students think is best. Both methods, though very different, are both successful.

Plant seeds in a variety of areas with different types/amounts of light. Observe their growth.

Use a sock to collect and grow seeds.

http://www.pbslearningmedia.org/resource/lsp07_sci.life.oate.lpexploreplant/exploring-plants/

Creative Writing: A Seed's Journey- Write as the seed in first person and describe it's journey.

Look at a selection of pictures of animals. Identify features that help them survive in different environments. (ex. a wolf's fur, a sea otter's webbed feet, a pelican's beak)

Pollination Tag:

- In order to play Pollen Tag, the students must create the props.
- Begin by asking the students to share their favorite fruit. Ask them to draw their favorite fruit on one side of a piece of paper. On the other side, each student draws a flower with a large center

(picture included).

- Put a layer of double-adhesive tape over the center of the flower. The students are given cotton balls to put on their flower center. This is the pollen of the flower! (Students can color their cotton balls differently to distinguish their "pollen" from others)
- Use these props to play a game of pollen tag! The rules of the game:
- Give safety guidelines so that students do not get hurt.
- 3 students are chosen as pollinators (bees, butterflies, and houseflies are good examples- these cut out are provided)
- The pollinators go around and tag the "flowers" (other students)
- When a "flower" gets tagged, they need to give the "bee" some pollen.
- If the bee already has pollen, they give it to the flower.
- Once the flower has all new pollen, he/she turns into a fruit by flipping their paper over. This is because it received pollen from another flower.
- These fruits go to the side and rest on a knee.
- The game can end when most students are fruits.

Pollination Lesson Plan:

<http://www.discoveryeducation.com/teachers/free-lesson-plans/pollination-parties.cfm>

Letter Assessment Checklist

	Yes	No
1. Included all elements of a friendly letter (date, greeting, body, closing, signature).		
2. Selected a tool and defended that choice.		
3. Included supporting evidence (at least 2 reasons)		

STAGE 1 – DESIRED RESULTS

Unit Title: Life Science: Biological Evolution: Unity and Diversity

Grade Level: Second

Length/Timing of Unit:

Designer(s): Pascack Valley Regional Science Committee

Science State standards addressed (verbatim):

2-LS1-1: Make observations of plants and animals to compare the diversity of life in different habitats. [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.] [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.]

Connections to Common Core Standards (verbatim):

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)

Mathematics:

MP.2 Reason abstractly and quantitatively. (2-LS2-1)

MP.4 Model with mathematics. (2-LS2-1),(2-LS2-2)

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 using information presented in a bar graph. (2-LS2-2)

Essential Questions (3-4) in provocative, student-friendly language:

- EQ1. How does the environment affect which animals and plants inhabit the area?
- EQ2. How can we identify the types of plants and animals that live on land versus living in water?

Big Ideas/ Enduring Understandings: *Students will understand that...*

EQ1:

- Different animals and plants live in certain areas based on their survival needs.
- Plants and animals live in specific places based on a variety of factors, including climate and survival needs.

EQ2:

- Plants and animals that live on land versus in water have different needs.

A list of factual knowledge to be taught – *Students will know...*

EQ1:

- The various climates located on a map.
- The survival needs of plants and animals.
- The characteristics of landforms and bodies of water.
- Specific examples of various types of plants and animals (ex: cactus, squirrel)

EQ2:

- The various climates located on a map.
- The survival needs of plants and animals.
- The characteristics of landforms and bodies of water.
- Specific examples of various types of plants and animals (ex: cactus, squirrel)

A list of skills to be taught or reinforced (including habits of mind) – *Students will be able to...*

- Investigate the environment in which they live, make observations on plant and wildlife, and make comparisons with other environments and their plant and animal life .
- Collect data about their environment and analyze this data. The students will then be able to explain the data that they collected.
- Use data to make generalizations about the differences between land and water animals.

STAGE 2 – ASSESSMENT EVIDENCE

Goal: Evaluate and compare habitats of specific animals by making observations.

Role: Zoo Keeper

Audience: Members of the zoo board

Situation: Due to budget cuts, the local zoo is closing. The zoo keeper must find suitable homes for all the animals. Help decide which is the best environment for the animal, based on its needs.

Product/Performance and Purpose:

In pairs, examine the special features of one animal and what it needs to survive. Examine the three given

environments. Chart the pros and cons of each one for this animal. Based on your evaluation of the environments, choose the best one. Provide supporting evidence.

Standards and Criteria for Success:

Each pair must complete the following activities

1. A drawing of the animal in the chosen habitat
2. Labels that identify special features of the animal
3. Labels that identify special features of the habitat
4. An explanation of why each animal feature matches with the chosen habitat

Additional Activity: Create a “Wanted” poster for the ideal habitat for an animal. Draw a picture of the habitat and include at least five characteristics of the habitat. (Ex. Forest for a bear- rivers, fish to eat, caves to hibernate in, no hunters, cool/cold weather)

STAGE 3 – LEARNING PLAN

Resources:

Videos:

Brain Pop Jr videos: Classifying Animals, Rainforests, Deserts, Ocean Habitats, Freshwater Habitats, Arctic Habitats

Books:

Where Animals Live by Brenda Stones

Do Turtles Sleep in Treetops? by Laura Purdie Salas

How Ducks Don't Get Wet by A. Goldin

The Tiny Seed by Eric Carle

From Seed to Dandelion, From Seed to Pumpkin, From Acorn to Oak Tree by Jan Kottke

From Seed to Plant, It Could Still Be a Flower by Allan Fowler

Websites:

Discovery Education- Habitats of the World

Explanations of each habitat: http://wwf.panda.org/about_our_earth/ecoregions/about/habitat_types/habitats/

Lesson ideas: <http://sciencenetlinks.com/lessons/animal-diversity/>

Lesson/Activity Ideas:

Choose an animal to research. What type of habitat does that animal live in? Could it survive in a different habitat? Why or why not?

Give students a selection of animal pictures. Classify by common adaptations.

Go on a nature walk. Observe, draw, and label plants and animals in that habitat.

Online game: Magic School Bus Great Habitat Match Up

<http://www.scholastic.com/magicschoolbus/games/habitat/index.htm>

Habitat webquest: <http://www2.lhric.org/course/irvingtn/rothchan/habitat1.htm>

Landforms online quiz: <http://www.thatquiz.org/tq/previewtest?VVIX7518>

Animal Habitat Assessment Checklist

	Yes	No
1. List of pros and cons for each habitat		
2. Detailed drawing of the animal in its chosen habitat		
3. Animal labels		
4. Habitat labels		
5. Written rationale of chosen habitat		

STAGE 1 – DESIRED RESULTS

Unit Title: Earth Science: Earth's Systems and Changes

Grade Level: Second

Length/Timing of Unit:

Teacher(s)/Designer(s): Pascack Valley Regional Science Committee

Science State standards addressed (verbatim):

2-ESS1-1 Use information from several sources to provide evidence that Earth events can occur quickly or slowly.

[Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly.] [Assessment Boundary: Assessment does not include quantitative measurements of timescales.]

Connections to Common Core Standards (verbatim):

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-ESS1-1)

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-ESS1-1)

RI.2.9 Compare and contrast the most important points presented by two texts on the same topic. (2-ESS2-1)

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. (2-ESS1-1)

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-ESS1-1)

W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-ESS1-1)

SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. (2-ESS1-1)

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-ESS2-2)

Mathematics

MP.2 Reason abstractly and quantitatively. (2-ESS1-1)

MP.4 Model with mathematics. (2-ESS1-1)

MP.5 Use appropriate tools strategically. (2-ESS2-1)

2.NBT.A Understand place value. (2-ESS1-1)

2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. (2-ESS2-2)

2.MD.B.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-ESS2-1)

Essential Questions (3-4) in provocative, student-friendly language:

- EQ1: What factors change how the earth looks?
- EQ2: What events happen quickly that change the Earth? What events happen slowly that change the Earth?
- EQ3: How can we prevent wind and water from changing the land?
- EQ4: How do we represent the shapes and kinds of land and bodies of water in an area?
- EQ5: What forms can water take?

Big Ideas/ Enduring Understandings: *Students will understand that...*

EQ1:

- Earth changes over time through a variety of events.

EQ2:

- The shape of land changes by natural forces such as wind and water.

EQ3:

- Earth can change, but dikes, windbreaks, and natural resources can hold back the land.

EQ4:

- Maps help to locate where kinds of land and bodies of water are located.
- Water can be found in oceans, rivers, lakes, and ponds

EQ5:

- Water can exist as both solid ice and as a liquid.

A list of factual knowledge to be taught – *Students will know...*

EQ1:

- How to read a map.
- Various landforms covering the Earth.
- Examples of events and how they change the land (ex: wind and water)

EQ2:

- Examples of sudden changes and changes that occur over time.

EQ3:

- Examples of ways to prevent wind and water from changing the land.

EQ4:

- How to use a map key.

EQ5:

- Water exists in various forms in various places on Earth.

A list of skills to be taught or reinforced (including habits of mind) – *Students will be able to...*

- Observe the environment around them, record specific data, and see the changes through the seasons.
- Share examples of events that have occurred affecting the Earth. The students will be able to explain which ones happened quickly and which have happened slowly over time.
- Explain which changes have benefited the Earth and which have been detrimental.
- Analyze a situation and interpret which design would best hold back the land.
- Construct a map that represents different kinds of land and bodies of water.
- Investigate where water is found on Earth.
- Utilize a map and other resources to identify where water is a solid and where water is a liquid.

STAGE 2 – ASSESSMENT EVIDENCE

Assessment #1:

Goal: Design a solution to prevent or slow erosion.

Role: Landscape Engineer

Audience: Members of the community

Situation: During Hurricane Sandy, many beachfront homes were severely damaged from the rising ocean water. It has taken a lot of hard work and time to help mother nature rebuild the property. We would like your help in developing some plans to prevent future erosion from happening to our houses. A panel of experts will decide upon the best design. Please use what you know about processes that shape the earth and erosion prevention to create your plan.

<http://www.scholastic.com/teachers/article/keeping-coastal-erosion>

Product/Performance and Purpose:

In a group, use what you know about methods to prevent erosion to develop a plan to protect a beachfront home from future destruction from rising ocean water. Please brainstorm a list of solutions, including materials needed. As a group, design an architectural drawing that displays your solution to protect the home. Please include labels of materials. Plan a presentation where each person has a role in explaining your plan.

Standards and Criteria for Success:

Each group must present:

1. A labeled drawing, detailing materials and how they were used
2. Each person must be responsible for a part of the presentation:
 - a. Role #1: Explaining the drawing and labels
 - b. Role #2: Explain why you choose those materials

Assessment #2:

Goal: Research and compare a variety of specific events that changed the earth.

Situation: Read and explore about a selection of natural changes that occurred both slowly and quickly (ex. San Francisco earthquake, Hurricane Sandy, eruption of Mount St. Helen, creation of Grand Canyon). Create a class timeline of these events. Create a class pie chart to show the duration of each event. Choose two of these events and create a Venn diagram to chart their similarities and differences.

STAGE 3 – LEARNING PLAN

Resources:

Videos:

Billy Blue Hair: What is Erosion? <https://www.youtube.com/watch?v=G5Rp9MJGCU>

Bill Nye on Erosion <https://www.youtube.com/watch?v=J-ULcVdeggE>

<http://beyondpenguins.ehe.osu.edu/issue/earths-changing-surface/our-changing-earth-virtual-bookshelf>

<http://www.weatherwizkids.com/weather-hurricane.htm>

Brain Pop Jr. Videos: Earthquakes, Hurricanes, Slow and Quick Changes

Books:

Fossils Tell of Long Ago by Alikei

Erosion: Changing Earth's Surface by Robin Koontz

Cracking Up: A Story About Erosion by Jacqui Bailey

Soil Erosion and How to Prevent It by Natalie Hyde

The Disappearing Mountain and Other Earth Mysteries by Louise Spilsbury

Websites:

<http://quizlet.com/2514573/2nd-grade-landforms-flash-cards/>

Presentation on slow changes http://schools.bcsd.com/fremont/4th_Sci_earth_slow-changes.htm

Online Interactive-Activity: <http://sciencenetlinks.com/media/filer/2011/10/07/forces.swf>

Amazing Resource (please google): Santa Ana Changing Earth Second Second Grade (pdf)

Ideas for experiments on erosion caused by wind, waves, and rivers

<https://www.youtube.com/watch?v=ZNJe6hrdL3M>

Erosion Lab <http://www.scholastic.com/teachers/lesson-plan/dirtmeister39s-science-lab-erosion>

Lessons on earthquakes, volcanoes, plate tectonics <http://msnucleus.org/membership/html/k-6/pt/index.html>

Test different types of rock to determine their characteristics

http://www.bbc.co.uk/schools/scienceclips/ages/7_8/rocks_soils.shtml

Lesson/Activity Ideas:

Animal Habitat Assessment Checklist

	Yes	No
1. List of possible solutions with materials		
2. Drawing of solution with labels		
3. Presentation including each team member		