Discover Rain Gardens and Stormwater Systems

For Grades K-5

Connecting the Arts to

Literacy, Science, and Social Studies

A project of East Side Arts Council and the Saint Paul Port Authority, with funding from the McNeely Foundation

Preface

The Arts especially address the idea of aesthetic experience, and aesthetic experience is one in which your senses are operating at their peak. When you're present in the current moment, when you are resonating with the excitement of this thing that you're experiencing, when you are fully alive.

- Sir Ken Robinson
(Robinson, 2008)

This collection of K-5 lessons aims to support relevant and authentic learning experiences that are complex, offer challenging tasks, and require high-level thinking to achieve high-level products. The integration of the Arts helps make this possible by empathizing the creative, challenging, and imaginative link to the natural inquiry-rooted flow of the learning process.

There are three approaches taken in integrating visual arts into these lessons: with, about/in, and through. Teaching with art is teaching students by using artworks as primary sources. Teaching about and in art is teaching specific art forms and elements, thereby developing the tools necessary for aesthetics, creativity, and many forms of artistry. And lastly, teaching through art is using art to teach specific subjects; for example, using art seen in the environment, such as butterfly wings, to teach concepts of mathematics (symmetry), and science. Used together, learning with, in/about, and through art can create empathetic relationships and real world understandings through comprehensive lessons that will help extend learning from the classroom into the community and vice versa.

These lessons, although grade specific, can be used interchangeably as long as the rigor and focus are adjusted to comply with the learning standards specific for each grade. The lessons are focused around two of the artistic sculptures at Beacon's Bluff – the Storm Water Demonstration and the Rain Garden. We hope that you enjoy these lessons, and appreciate your feedback.

About the Author

Susannah Harris has six years of teaching and teaching-related experience and is a graduate of the Primary/Junior division of the Master of Teaching program at the Ontario Institute for Studies in Education (OISE) at the University of Toronto. She is currently an Americorps VISTA in the Minneapolis Public School District, and is part of the English Language Arts team in the Department of Teaching & Learning. Thematic curriculum and arts integration are two of Susannah's greatest passions.

Public Art at Beacon Bluff

The Saint Paul Port Authority

The Beacon Bluff Business Center is a project of the Saint Paul Port Authority. The Port Authority was created in 1932 to manage the Mississippi River harbor in Saint Paul and in the 1960's began cleaning up Saint Paul's polluted soil and redevelop it, neighborhood by neighborhood, into burgeoning business centers. Working closely with the Minnesota Pollution Control Agency and other partners, the Port Authority has turned 21 polluted and often abandoned inner-city sites into environmentally friendly business centers. In 2010, the Saint Paul Port Authority went further in protecting the environment by installing a state-of-the-art stormwater treatment system at Beacon Bluff. The system will eliminate over 90 percent of the runoff sediment from 163 acres of Saint Paul East Side that previously flowed untreated into the Mississippi River. A plaza is host to what is known as the "HUB" of a public interpretive effort that shares historical information as well as educational and demonstrational information pertaining to Next Generation Stormwater practices and Next Generation Energy strategies at Beacon Bluff.

The East Side Arts Council

In 2012, the Saint Paul Port Authority invited the East Side Arts Council to bring artists to the Beacon Bluff Development Project. ESAC secured an NEA fast track grant to create a sculpture piece for the rain garden. Two educational installation pieces by East Side Arts Council artist Gita Ghei now stand at the site of the next generation energy Beacon Bluff Business Center. One of the sculptures is a demonstration of how the stormwater treatment system installed by the Saint Paul Port Authority filters out runoff sediment, protecting the Mississippi River.

The mission of the East Side Arts Council is to collaborate with our community and artists to celebrate and experience the arts. ESAC offers professional arts programs year-round that celebrate the diversity of East Side neighborhoods, linking to learning in schools and community centers, and building appreciation of the arts in the under-served, challenged East Side of St. Paul.

Contents

What Is A Rain Garden?

A rain garden is a shallow pit planted with native plants that uses rainwater runoff to nourish what grows there.

What Is Rainwater Runoff?

When it rains, water gathers on our streets, sidewalks, and parking lots with nowhere to go. It can cause harmful erosion to our neighborhoods and pollutes our sources of water. Rain gardens catch all the runoff, allowing it to soak into the ground and water the beautiful native plants.

Why Native Plants?

Native plants are planted in rain gardens because they do not require fertilizer or any special care to flourish. Also, they attract local birds and wildlife who enjoy rain gardens as much as we do!

Visiting Beacon Bluff

This curriculum, "Discover Rain Gardens and Stormwater Curriculums at Beacon Bluff: Connecting the Arts to Literacy, Science, and Social Studies," is designed to address current education standards through art and experiential learning for grades kindergarten through fifth.

The Beacon Bluff rain garden site is located in East Saint Paul on East 7th Street, just a block east of Arcade in an industrial park surrounding The Hub, a next generation energy business center. Two educational public art pieces, designed specifically for this project by artist, Gita Ghei, connect with the curriculum in a demonstration of rain gardens and storm water runoff.

In addition to the educational arts experiences students will participate in at Beacon Bluff, each lesson in the curriculum includes a creative project for the classroom to highlight what they have learned.

Beacon Bluff Storm Water Demo

Lesson

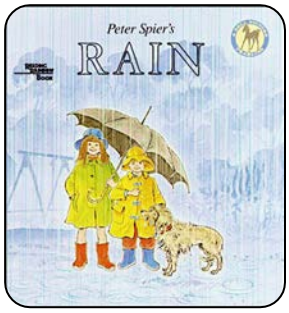
Rain: A Sensory Poem

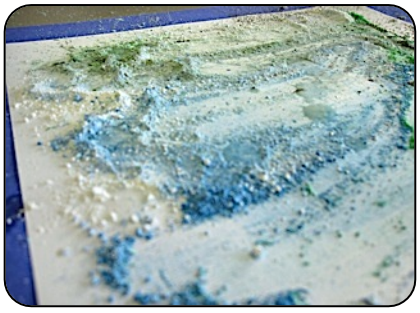
Curriculum Areas/Strand/Grade Level:

Language Arts: 0.1.2.2, 0.2.1.1, 0.3.0.4, 0.8.2.2, 0.10.5.5.c/Kindergarten
Art: 0.1.1.5.1, 0.1.2.5.1, 0.3.1.5.1/Kindergarten
Science: 0.1.1.2.1/Kindergarten

Project (Or, Background and Introduction)

In this lesson, students will use their senses by writing poetry as a class, painting "rain" pictures, and observing the Beacon Bluff Storm Water Demo area to see how rain works in nature. Students will first listen to the sound of rain, then work as a class to reflect on their shared auditory experience. Peter Spier's Rain, by Peter Spier, will be read/shown to the class while discussing the experiences the children have in the rain. At the Storm Water Demo, have students reflect on how the artist has portrayed rain, and how it is important to the environment. Lastly, the students will come back to the classroom and create rain pictures through powdered tempera paint and rain!





Learning Expectations

- I can use observations to develop an accurate description of a natural phenomenon and compare one's observations and descriptions with others.
- I can ask and answer questions about key details in text with prompting and support
- I can read emergent-reader texts with purpose and understanding
- I can confirm understanding of a text by asking and answering and requesting clarification if something is not understood
- I can identify real-life connections between words and their use
- I can identify the elements of visual art including color, line, shape, texture, and space
- I can identify the tools, materials, and techniques from a variety of two and three-dimensional media
- I can share and describe a personal artwork

Supplies

- Peter Spier's Rain by Peter Spier
- Online rain audio clip (via YouTube) and speakers
- Chart paper and markers
- A rainy day!
- Heavy white paper
- Powdered tempera paint (various colors)
- Shaker bottles (spice shakers, salt shakers, empty glitter shakers with shake tops in place)
- Smocks to protect clothes
- Pencils
- Place to dry paintings
- Newspaper
- Trash bags or large vinyl table cloth

Time: (Min)	Introduction/Prior Knowledge: Mental Set ("the hook"):	Have students gather around and sit in a circle. Ask them to close their eyes and listen to the sound. Play the rain audio clip for a minute or so, then ask them to open their eyes and share what they heard, how it made them feel, what did it make them think. Write down some key words from student recollection on chart paper with marker.
Time:	Sharing the Purpose/Objectives (What's in it for the? Why should they participate?): We will be exploring our senses and rain! We will focus on how rain makes us feel, think, and how it helps nature. We will be making paintings with the help of rain	
Time: Groupings: (If necessary) Supplies	Lesson: - With your students, try to create a poem/song using the key words that were written down on the chart paper to the tune of "rain rain go away" but changing the lyrics. It is recommended to keep the initial "rain, rain" part of the song. You can make as many lines as you want, try to have them rhyme and have your students thinking about rhyming words. - Next, read Peter Spier's Rain. Because it is without text, be sure to ask questions about the pictures and engage the students' visual literacy skills. After reading, discuss with the students how the book made them feel, and their own prior knowledge of rain and their own experiences. Give each student a chance to share. - Visit the Beacon Bluff Storm Water Demo. Ask the students to find examples of rain in the storm water demo and how rain has an influence on nature. - Return to the classroom, have each student put on a smock to protect their clothes. Lay out newspaper on a large, flat surface. Have different colors of powdered paint set out in the shaker containers. Give each child a piece of heavy white paper and write their names on the back with pencil. Demonstrate – gently shake a color of your choice onto the plain paper. Sprinkle it randomly around your paper using a light hand to not overly powder the paper. Choose another color and repeat until you are satisfied. Place plastic trash bags or table cloth outside in the rain. Depending on how hard it is raining, let the pictures stay out in the rain until the desired effects are achieved. Bring in paintings and let dry. Once dry, spray with hairspray to set the paint.	
Time: Groupings:	Closure (sharing what was learned): Let your students go on a gallery walk to see each other's paintings. Sing the new version of "rain, rain, go away" together, and in a group, ask the students to reflect on their experience.	
Notes/Reminders/Homework Assigned:		
Lesson Reflections (successes, challenges, changes, next steps):		

Diagnostic Assessment	Formative Assessment	Summative Assessment
✓ Observation ✓ Anecdotal Notes ✓ Interview ☐ Surveys ☐ Test/Quiz ☐ Questionnaires ☐ KWL (know, want to know, learned)	✓ Observation ✓ Anecdotal Notes ✓ Work Samples ☐ Test/Quiz ☐ Checklist ☐ Conference ✓ Peer Assessment ✓ Self Assessment	☐ Rubric ☐ Unit Test ☐ Self Assessment ☐ Peer Assessment ☐ Learning Log/Journal ✓ Projects ✓ Presentation ☐ Reports (oral/written)

Purpose:

- ✓ Mental Set
- ✓ Sharing Purpose/Objectives
- ✓ Input
- ✓ Modeling
- ✓ Checking for Understanding
- ✓ Guided Practice
- ☐ Independent Practice
- ☐ Closure

Collaborative/Social Skills:

- ✓ Participate Fully
- ✓ Listening Attentively
- ✓ Expressing Appreciation
- ✓ Reflecting on Experience
- ✓ Valuing Diversity
- ✓ Thinking Constructively
- ✓ Making Responsible Decisions
- ✓ Resolving Conflict
- ✓ Solving Problems Creatively
- ✓ Working on Tasks Together
- ✓ Celebrating Achievement

Accommodations/Modifications

- ✓ Increase time, space, amount
- ✓ Decrease
- ✓ Change
- ✓ Scribe
- ✓ Oral Explanations
- ✓ Peer tutor/Partner
- ✓ Use manipulative

Blooms Taxonomy:

- ✓ Knowledge
- ✓ Understanding
- ✓ Application
- ✓ Analysis
- ☐ Synthesis
- ☐ Evaluation

Multiple Intelligences:

- ✓ Linguistic
- ✓ Spatial
- ✓ Interpersonal
- ☐ Logical/Mathematical
- ☐ Bodily/Kinesthetic
- ☐ Musical
- ✓ Naturalistic
- ✓ Intrapersonal

Beacon Bluff

Rain Garden

Lesson

Let's Make a Nature Mosaic

Curriculum Areas/Strand/Grade Level:

Social studies: 0.3.2.3.1/K
Science: 0.4.1.1.1/K
Art: 0.1.1.5.1, 0.2.1.5.1, 0.3.1.5.1/K

Project

(Or, Background and Introduction)

One of the best ways for students to learn about the world around them is to have them experience it! In this lesson, students will first talk about what they see inside the classroom and out the window. Then, the students will take a mini-field trip to Beacon Bluff and observe the plants, trees, and animals that they see.

The students will then go back to the classroom, discuss what they learned, and create "nature mosaics" of plants or animals they saw.

Learning Expectations

- I can identify the physical characteristics of a place, including real or imagined.
- I can observe and compare plants and animals
- I can identify external parts of a variety of plants and animals
- I can identify the elements of visual arts including color, line, shape, texture, and space
- I can create original two and three-dimensional artworks to express ideas, experiences, or stories
- I can share and describe a personal artwork

Supplies

- Cardboard (a flat square piece is best, otherwise poster board is ok), about 8x8
- Glue and paintbrushes
- Ruler
- Small paper bowls (for glue)
- Pencil/crayon/marker
- Dried beans (a variety, like different colored lentils. Be sure to get a lot of green-colored beans) ***SAFETY NOTE*** Raw Kidney beans are poisonous if eaten.
- Newspaper (to cover work surface)
- Box small enough to easily hold but big enough to put a small stuffed animal in. Cut two circles on either side.
- Misc. objects with good texture and structure for students to touch – i.e. leaves, grass, grapes, a feather, etc.

Time: (Min)	**Introduction/Prior Knowledge:** Mental Set ("the hook"): Look around the room, what kind of plants or animals do you see? Let's all look out the window, what are some things you see? Show pictures of Egypt or other areas and ask students what examples of nature they see.
Time:	**Sharing the Purpose/Objectives (What's in it for the? Why should they participate?):** The world is has many places that look different, but almost all of them have plants and animals! Today we will see what kind of plants and animals we find in the world around us.
Time: **Groupings: (If necessary) Small groups** **Supplies:** - Glue - Cardboard - Paintbrush - Bowls for beans and paint - Newspaper - Rulers Marker/crayons /pencils	**Lesson:** - To check prior knowledge, play the Mystery Box game – cut two holes on either side of box, place different items in box and let students come up and touch what's inside the box. Let about 4 students per item touch what's inside. After all 4 have touched the item, ask them if they can guess what it is, how they knew/guessed, and why. Show the item. Repeat with different items until every student has had a chance. - Go on a walk to Beacon Bluff. Once there, have students play a game of "I spy" to get them engaged and looking at different plants and animals (animals may be tricky, perhaps have them guess what animal might live in that area by giving them clues). - Back in the classroom, briefly discuss what was seen, then explain that they will be creating pictures of nature they saw at Beacon Bluff. Show the students some examples of nature mosaic art (do an image search for "nature mosaic art" on Google.com for a ton of great examples; be sure to use both plant and animal examples). Quickly demonstrate on the board how to draw straight lines and shapes, like squares, triangles, and diamonds. Then, demonstrate how you would use lines to create lines for your plant outline so you have a guide for when you glue your beans. Show students how to glue beans onto the paper (using the paintbrush to apply glue to cardboard – little sections at a time). Show an example of a completed work you made (but do not keep out, otherwise students may copy yours!) - Give each student an 8x8 cardboard square, a ruler, and a marker/crayon/pen so they can draw their outline. Have students work in small groups, give each group a bowl of glue and two bowls with a mix of different types and colors of beans. Encourage students to think about colors and patterns, and try to have them use many different types of beans. Help students paint glue into sections of their picture a little at a time. - It's a good idea to let students glue sections/arts of their picture one at a time and then wait a few minutes to let the glue dry before moving on to the next.
Time: **Groupings:**	**Closure (sharing what was learned):** Let the glue dry thoroughly before letting the students show their work. Check on the glue the next day, possibly re-glue parts where the beans didn't adhere. Have a gallery walk and allow students to walk around and check out each other's work.
Notes/Reminders/Homework Assigned:	
Lesson Reflections (successes, challenges, changes, next steps):	

Diagnostic Assessment	Formative Assessment	Summative Assessment
✓Observation ✓Anecdotal Notes ✓Interview ☐ Surveys ☐ Test/Quiz ☐ Questionnaires ☐ KWL (know, want to	✓Observation ✓Anecdotal Notes ☐ Work Samples ☐ Test/Quiz ☐ Checklist ☐ Conference ☐ Peer Assessment	☐ Rubric ☐ Unit Test ☐ Self Assessment ☐ Peer Assessment ☐ Learning Log/Journal ✓Projects ✓Presentation ☐ Reports (oral/written)

Purpose:

- ✓Mental Set
- ✓Sharing Purpose/Objectives
- ✓Input
- ✓Modeling
- ✓Checking for Understanding
- ✓Guided Practice
- ✓Independent Practice
- ☐ Closure

Collaborative/Social Skills:

- ✓Participate Fully
- ✓Listening Attentively
- ✓Expressing Appreciation
- ✓Reflecting on Experience
- ✓Valuing Diversity
- ✓Thinking Constructively
- ✓Making Responsible Decisions
- ✓Resolving Conflict
- ✓Solving Problems Creatively
- ☐ Working on Tasks Together
- ✓Celebrating Achievement

Accommodations/Modifications

- ☐ Increase time, space, amount
- ☐ Decrease
  - ✓Change
- ☐ Scribe
- ☐ Oral Explanations
  - ✓Peer tutor/Partner
- ☐ Use manipulative

Blooms Taxonomy:

- ✓Knowledge
- ✓Understanding
- ✓Application
- ☐ Analysis
- ☐ Synthesis
- ☐ Evaluation

Multiple Intelligences:

- ☐ Linguistic
- ✓Spatial
- ☐ Interpersonal
- ☐ Logical/Mathematical
- ☐ Bodily/Kinesthetic
- ☐ Musical
- ✓Naturalistic
- ☐ Intrapersonal

Lesson

Exploring Weather Conditions Through Painting and Sculpture

Curriculum Areas/Strand/Grade Level:

Language Arts: 1.2.1.1, 1.2.6.6, 1.2.10.10, 1.3.0.4.a/1st grade
Social Studies: 1.3.2.3.1/1st grade
Art: 0.1.1.5.1, 0.2.1.5.1, 0.3.1.5.1/1st grade

Project

(Or, Background and Introduction)

In this lesson, students will learn about how weather influences culture, daily life, the environment, and mood by examining paintings and the storm water demo at Beacon Bluff that depict different types of weather. Students will demonstrate their understanding by painting a picture depicting a particular weather condition.

Learning Expectations

- I can ask and answer questions about key details in a text
- I can distinguish between information provided by pictures or other illustrations and information provided by the words in a text
- I can read informational texts appropriately complex for grade 1, as well as select texts for personal enjoyment, interest, and academic tasks.
- I can read on-level texts with purpose and understanding
- I can understand he physical and human characteristics of place
- I can identify elements of visual arts
- I can create original two and three-dimensional art
- I can show and describe a personal artwork

Supplies

- Elements of art and design sheet http://artsedge.kennedy-center.org/~/media/ArtsEdge/LessonPrintables/grade-3-4/weather_conditions_elements_of_art_and_design.ashx
- Weather and Painting interactive http://interactives.mped.org/preview_mg.aspx?id=356&title=
- Computer and projector/Smart board/Prometheum and printer
- Watercolor paints and paint brushes
- Cups of water (one per student)
- Salt (enough to share per group of 4 or several shakers)
- White paper for watercolor paint
- Online pictures depicting weather shown in artworks

Time: (Min)	Introduction/Prior Knowledge: Mental Set ("the hook"):	Gather students around a window in the classroom and look outside to observe the weather ask the students: what is the weather like today? What is the current season? How would you describe the colors in this season? What objects or changes in the environment give you clues about the weather and/or season? What's your favorite kind of weather? Why?
Time:	Sharing the Purpose/Objectives (What's in it for the? Why should they participate?): Today we will talk about how weather influences how we feel, culture, our daily life, and the environment by looking at paintings and the storm water demo at Beacon Bluff. Then we will create our own weather artwork using a really cool technique.	
Time: Groupings: (If necessary) Supplies	Lesson: - Show students the Weather and Painting interactive. As the students look at the paintings, ask them: how is light used in this picture? What kind of feeling do you get from this painting? How are the colors showing light and darkness? - Discuss the elements of art and design with your students. If necessary, use visuals to demonstrate each element. Looking at the paintings again, review and analyze the pictures using the elements of design and how they portray weather conditions. - Have students select, analyze, and discuss their favorite painting. Have each student choose a favorite painting and break the students into groups according to their favorite. Print copies of the paintings to give to each group (several copies per group). Ask students to share their thoughts and feelings about why they liked the picture, discussing the art elements. Gather the students again as a large group and ask them to discuss some things they talked about. - Go on walk to Beacon Bluff and observe the storm water demo. Ask the students to find examples of weather. Ask students how this artist's representation of weather makes them feel, what they think it is trying to convey, and why the artist used weather in her art piece. Ask them how weather demonstrated here influences daily life and the environment. - Back in the class, show the students all of the weather conditions depicted in the artworks, including the geographical content. Then, demonstrate to students how to paint a scene with watercolor. Then, sprinkle salt over the wet painting to create texture. - Have students create their own paintings. Distribute to students watercolor paints, brushes, cups of water, salt, and white paper and white paper. Have students either 1.) paint an image of their favorite day based on the weather conditions of that particular season; or 2.) paint a weather/landscape scene of a particular day based on your own experience. Remind students of the importance of color to convey mood, the particular time of year, and weather conditions. - Have students place paintings on drying rack or cleared of space for work to dry.	
Time: Groupings:	Closure (sharing what was learned): - Have students write an artist's statement to go with their painting explaining what they did and why they painted that particular image. - Allow students to have a gallery walk around the classroom with their artist's statement next to their painting. Afterwards, as a class, discuss why there are changes in colors. Ask if there is a difference between a storm by the sea versus a storm in the mountains. Discuss how artists convey similar weather differently. What is their favorite type of weather/season and describe why.	
Notes/Reminders/Homework		
Lesson Reflections (successes, challenges, changes, next steps):		

Diagnostic Assessment

- ✓ Observation
- ✓ Anecdotal Notes
- ✓ Interview
- ☐ Surveys
- ☐ Test/Quiz
- ☐ Questionnaires
- ☐ KWL (know, want to know, learned)

Formative Assessment

- ✓ Observation
- ✓ Anecdotal Notes
- ✓ Work Samples
- ☐ Test/Quiz
- ☐ Checklist
- ☐ Conference
- ☐ Peer Assessment
- ☐ Self Assessment

Summative Assessment

- ☐ Rubric
- ☐ Unit Test
- ☐ Self Assessment
- ☐ Peer Assessment
- ☐ Learning Log/Journal
- ✓ Projects
- ✓ Presentation
- ✓ Reports (oral/written)

Purpose:

- ✓ Mental Set
- ✓ Sharing Purpose/Objectives
- ✓ Input
- ✓ Modeling
- ✓ Checking for Understanding
- ✓ Guided Practice
- ☐ Independent Practice
- ☐ Closure

Collaborative/Social Skills:

- ✓ Participate Fully
- ✓ Listening Attentively
- ✓ Expressing Appreciation
- ✓ Reflecting on Experience
- ✓ Valuing Diversity
- ✓ Thinking Constructively
- ✓ Making Responsible Decisions
- ✓ Resolving Conflict
- ✓ Solving Problems Creatively
- ✓ Working on Tasks Together
- ✓ Celebrating Achievement

Accommodations/Modifications

- ✓ Increase time, space, amount
- ✓ Decrease
- ✓ Change
- ✓ Scribe
- ✓ Oral Explanations
- ✓ Peer tutor/Partner
- ☐ Use manipulative

Blooms Taxonomy:

- ✓ Knowledge
- ✓ Understanding
- ✓ Application
- ✓ Analysis
- ☐ Synthesis
- ☐ Evaluation

Multiple Intelligences:

- ✓ Linguistic
- ✓ Spatial
- ✓ Interpersonal
- ✓ Logical/Mathematical
- ☐ Bodily/Kinesthetic
- ☐ Musical
- ✓ Naturalistic
- ✓ Intrapersonal

Beacon Bluff

Rain Garden

Lesson

Let's Make a Map!

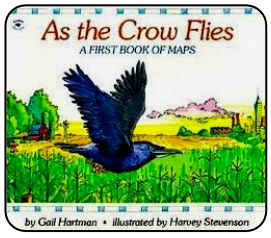
Curriculum Areas/Strand/Grade Level:

Social Studies: 1.3.1.1.1, 1.3.1.1.2, 1.3.2.3.1/1st grade
Art: 0.1.1.5.1, 0.2.1.5.1, 0.3.1.5.1/1st grade

Project (Or, Background and Introduction)

This lesson is a great way to either introduce or practice reading maps. To begin, please read As the Crow Flies: A First Book of Maps by Gail Hartman to the class. Afterwards, students will practice understanding scale, the reasons for using small objects to represent large ones on a map, and practice understanding the bird's-eye view of maps by making a map of the class with the teacher direction. They will then practice using relative and absolute location words by going on a field trip to Beacon Bluff. To complete the map lesson, the book The Night Pirates by Peter Harris should be read as a precursor for the final art activity, pirate map making. Both books are available at St. Paul Public Libraries.

Students will also look at photos of areas very different from their own, such as photos of Egypt and the Arctic, and discuss via Venn Diagram the similarities and differences in the natural and man-made characteristics of those places and where we live. **This can be broken up into two or three lessons.**



Learning Expectations

- I can sketch maps to illustrate spatial information about familiar places
- I can use relative location words and absolute location words to identify the location of a specific place
- I can explain why or when it's important to use absolute verses relative location
- I can compare physical and human characteristics of a local place and a place far away on a globe or map
- I can identify the elements of visual arts
- I can create original two and three-dimensional art
- I can show and describe a personal artwork

Supplies

- A simple map with visual cues from your school to Beacon Bluff
- Cold coffee, tea, and orange juice Drying rack
- Sink (if no sink, use newspaper and paintbrushes to apply coffee/tea/juice to paper)
- Crayons, markers, colored pencils
- Photos of Egypt and the Arctic (be sure they show landforms, landmarks, and geographic characteristics)
- As the Crow Flies: A First Book of Maps by Gail Hartman
- The Night Pirates by Peter Harris
- Create a basic outline of your classroom and a pirate map template worksheets
- Chart paper

Time: (Min)	Introduction/Prior Knowledge: Mental Set ("the hook"):	With your students, make a map of the area around the school on chart paper. Ask questions that would engage them in reading the map. Read As the Crow Flies to your students, discussing the maps in the book as you read.
Time:	Sharing the Purpose/Objectives (What's in it for the? Why should they participate?): They will practice reading maps, following maps, and then make their own special treasure maps. Ask the class why they think maps are important and how they can be used. If needed, give examples that would need a map.	
Time: Groupings: (If necessary) Supplies See first page	- Discuss bird's-eye view to your students. Using the examples from the As a Crow Flies book, ask students how the map of the school area might look. Lay a few small objects on the floor (marker, pencil, Kleenex box, etc). Tell the students that each object represents a building from the school area map. Ask the students to pretend to be birds flying around in the sky; when they look down, how would the objects look? Discuss and draw the items on a piece of chart paper. - Ask the students how they think a map of the classroom would look? Discuss how to make one by using chart paper to make a map of the classroom with the students. Label the front, back, and sides of the map. Pass out the classroom outline sheet to the students and ask them to make their own classroom maps. - Go over the map you made to Beacon Bluff on a Smartboard or overhead projector before heading out to Beacon's Bluff as a class. Discuss what a landmark is, identifying landmarks on the map, and etc. Give each student a copy to use as a guide while walking to Beacon Bluff. Point out landmarks (trees, buildings, geographic landmarks, etc.) along the way and at Beacon Bluff that appear on the map you drew. - Once back in the classroom, go over relative and absolute location words, have students practice using those words by using the Beacon Bluff map and walk as an example. - Read The Night Pirates, discuss the maps in the book, and then tell students they will be designing their own hidden treasure pirate maps. Have an example pirate map done to show as an example, however do not permit the students to copy your own map. Show examples of paper dyed in coffee, tea, or orange juice. Demonstrate to students how they will crumple and dye the paper (depending on if you use the sink or paintbrush approach) to make it look old. Have paper-dying stations set up prior (best is by a sink or using a table covered in newspaper). Distribute the pirate map worksheet. - Before dying or crumpling their paper, have the students write their names on the back of their paper (the side that is not being drawn on/dyed). Students will need to let paper dry totally before drawing on them (should be dry next day). When they are totally dry, ask students what are some landmarks that might appear on a pirate map, write them on the board and add some so students can use it as a reference. Show your example and point out how the landmark examples for Beacon Bluff walk helped you find your way to Beacon Bluff. Let students work in small groups, give each group lots of markers, colored pencils, or crayons.	
Time: Groupings:	Closure (sharing what was learned): Let students present their pirate maps in small groups. Go over sentences they can use to ensure they use location words in their explanation (for example, "the house is *near* the oak tree", the school is *left* of the post office"). This is a great journal writing opportunity.	
Notes/Reminders/Homework Assigned:		
Lesson Reflections (successes, challenges, changes, next steps):		

Diagnostic Assessment	Formative Assessment	Summative Assessment
✓Observation ✓Anecdotal Notes ✓Interview ☐ Surveys ☐ Test/Quiz ☐ Questionnaires ☐ KWL (know, want to know, learned)	✓Observation ✓Anecdotal Notes ✓Work Samples ☐ Test/Quiz ☐ Checklist ☐ Conference ☐ Peer Assessment ☐ Self Assessment	☐ Rubric ☐ Unit Test ☐ Self Assessment ☐ Peer Assessment ☐ Learning Log/Journal ✓Projects ✓Presentation ☐ Reports (oral/written)

Purpose:	Collaborative/Social Skills:
✓Mental Set ✓Sharing Purpose/Objectives ✓Input ✓Modeling ✓Checking for Understanding ✓Guided Practice ☐ Independent Practice ☐ Closure	✓Participate Fully ✓Listening Attentively ✓Expressing Appreciation ✓Reflecting on Experience ✓Valuing Diversity ✓Thinking Constructively ✓Making Responsible Decisions ✓Resolving Conflict ✓Solving Problems Creatively ☐ Working on Tasks Together ✓Celebrating Achievement

Accommodations/Modifications	Blooms Taxonomy:	Multiple Intelligences:
☐ Increase time, space, amount ☐ Decrease ✓Change ☐ Scribe ✓Oral Explanations ✓Peer tutor/Partner ☐ Use manipulative	✓Knowledge ✓Understanding ✓Application ☐ Analysis ✓Synthesis ☐ Evaluation	✓Linguistic ✓Spatial ☐ Interpersonal ☐ Logical/Mathematical ☐ Bodily/Kinesthetic ☐ Musical ✓Naturalistic ✓Intrapersonal

Beacon Bluff

Rain Garden

Lesson

What a Plant Wants, What a Plant Needs

Curriculum Areas/Strand/Grade Level:

Science/2.4.1.1.1, 2.4.2.1.1, 2.4.3.1.1/2nd grade
Art/0.1.1.5.1, 0.1.2.5.1, 0.2.1.5.1, 0.3.1.5.1/2nd grade

Project

(Or, Background and Introduction)

Students are comparing the similarities and differences of plants. They will explore the physical characteristics and behaviors of plants and observe plant growth, change, and the needs it has to do so. The students will describe ways in which plants adapt to their environment to survive.

In this lesson, students will go to Beacon Bluff and observe the rain garden and how the rain helps fulfill plant needs. The students will create self-watering soda bottle terrariums, and later, once the seeds have sprouted, will make their own air-dry clay to create figures/decorations for their terrariums.

Learning Expectations

- I can describe and sort plants into groups in many ways, according to their physical characteristics and behaviors.
- I can recognize that plants need space, water, nutrients, and air, and that they fulfill these needs in different ways.
- I can describe the characteristics of plants at different stages of their life cycles.
- I can identify the elements of visual arts including color, line, slope, texture, and space.
- I can create original 2 and 3-dimensional artworks to express ideas, experiences, or stories.
- I can share and describe a personal artwork

Supplies

- Homemade polymer clay (for recipe, go to http://thenewnew.blogspot.com/2011/06/homemade-polymer-clay.html **test in advance**)
- One empty 2-liter bottle per student
- Potting soil
- Various seeds (suggested: lima beans, zinnias, string beans, marigolds, summer radishes, sunflowers, cosmos, and peas)
- Thick string or yarn (cotton or poly)
- Phillips screwdriver
- Sharp scissors to cut bottle
- Magnifying glasses (one per student/pair)
- Clip board, record chart, pencil
- Plant Group Chart

Time: (Min)	**Introduction/Prior Knowledge:** Mental Set ("the hook"): What do we know? As a whole class, students will brainstorm what they already know about plants. After class discussion, have students fill out a K-W-L (What I Know, What I Want to know, What I have Learned) with the topic of plants. Students will identify what they want to learn as a question. Have the students add to the KWL chart throughout the lesson.
Time:	**Sharing the Purpose/Objectives (What's in it for the? Why should they participate?):** At the end of this lesson, you will make your own terrarium (define) world that will demonstrate how plants grow. We will learn about how plants are different from each other and how plants grow from a seed.
Time: Groupings: (If necessary) Supplies	**Lesson:** - Go on a nature walk to Beacon Bluff Rain Garden. Give each student or pair of students a magnifying glass for them to use to observe plants more closely. Before setting out, ask students to predict four or five plants they think they will see. Give students the record chart and have them first predict what they think they will see and to record what they actually find and observe, either by naming or drawing the plant. Once at the Rain Garden, have the students observe how the rain garden works and why and how it benefits the plants. - Back in the classroom, lead a discussion and have students name or describe the plants they identified, observed, and recorded on their chart. Ask students to name other plants they didn't find on the walk. Ask how some of the plants are the same and how they could be grouped. Elicit that plants can be grouped by what they look like and where they live and grow. In pairs, ask them to work together and identify some groups of plants, to list some characteristics that are shared by the plants in that group, and to name any plants they have identified within that group. They each record their own results in the Plant Group Chart. Later have students explain the ways that they grouped their plants (ex: flowers, non-flowering, trees, weeds, vegetables). Ask them to describe what all plants in every group have the same. Elicit that all plants have the same parts (roots, stem, leaf, and flower). - On poster-sized paper, with your students, choose a plant and draw and color it showing all parts. Label the parts and write in sentences what each part does for the plant. In the background, draw where the plant would grow, showing things in the environment, which help the plant to live and grow (sun, clouds, rain, ground). Have students pick a plant from their record sheet to draw and label the parts to make a "plant poster", and then present their poster to the class. - Discuss the changes that occur in humans as they grow, compare it to plants. If possible, pre-cut the 2 liter bottles as seen on the website instructions. Set up an area of the classrooms with materials. Plant at least 3 seeds in each "pot" to ensure germination. Go to http://skruben.blogspot.com/2012/03/how-to-self-watering-seed-starter-pots.html. - Once plants sprout, using the clay, let students create animals/decorations for their terrariums
Time: Groupings:	**Closure (sharing what was learned):** Have students make regular observations and recordings of their plant's progress in their journals over the next two or three weeks every three days. Be sure to have students update their K-W-L charts.
Notes/Reminders/Homework Assigned:	
Lesson Reflections (successes, challenges, changes, next steps):	

Diagnostic Assessment

- ✓ Observation
- ✓ Anecdotal Notes
- ✓ Interview
- ☐ Surveys
- ☐ Test/Quiz
- ☐ Questionnaires
- ✓ KWL (know, want to know, learned)

Formative Assessment

- ✓ Observation
- ✓ Anecdotal Notes
- ✓ Work Samples
- ☐ Test/Quiz
- ☐ Checklist
- ☐ Conference
- ☐ Peer Assessment
- ✓ Self Assessment

Summative Assessment

- ☐ Rubric
- ☐ Unit Test
- ☐ Self Assessment
- ☐ Peer Assessment
- ✓ Learning Log/Journal
- ✓ Projects
- ✓ Presentation
- ☐ Reports (oral/written)

Purpose:

- ✓ Mental Set
- ✓ Sharing Purpose/Objectives
- ✓ Input
- ✓ Modeling
- ✓ Checking for Understanding
- ✓ Guided Practice
- ☐ Independent Practice
- ☐ Closure

Collaborative/Social Skills:

- ✓ Participate Fully
- ✓ Listening Attentively
- ✓ Expressing Appreciation
- ✓ Reflecting on Experience
- ✓ Valuing Diversity
- ✓ Thinking Constructively
- ✓ Making Responsible Decisions
- ✓ Resolving Conflict
- ✓ Solving Problems Creatively
- ✓ Working on Tasks Together
- ☐ Celebrating Achievement

Accommodations/Modifications

- ✓ Increase time, space, amount
- ✓ Decrease
- ✓ Change
- ✓ Scribe
- ✓ Oral Explanations
- ✓ Peer tutor/Partner
- ✓ Use manipulative

Blooms Taxonomy:

- ✓ Knowledge
- ✓ Understanding
- ✓ Application
- ✓ Analysis
- ✓ Synthesis
- ☐ Evaluation

Multiple Intelligences:

- ✓ Linguistic
- ☐ Spatial
- ✓ Interpersonal
- ☐ Logical/Mathematical
- ☐ Bodily/Kinesthetic
- ☐ Musical
- ✓ Naturalistic
- ✓ Intrapersonal

Name _____

Beacon Bluff Nature Walk Recording Chart

Predict: What plants do you think you will see?	Observe and Record: Name/Draw the plants you saw

Name _____

Plant Group Chart

Name of Plant Group	Plants that Belong	Why They Belong

Beacon Bluff

Rain Garden

Lesson

The Stages of Water in Nature

Curriculum Areas/Strand/Grade Level:

Science: 2.2.1.2.1/2nd grade
Social Studies: 2.3.4.9.1/2nd grade
Art: 0.1.1.5.1, 0.1.2.5.1, 0.2.1.5.1, 0.3.1.5.1/2nd grade

Project

(Or, Background and Introduction)

Students are learning about the properties of water – solid, liquid, and gas – and how it changes from one form to another. They are also learning about the cause and consequences of human impact on the environment and how it influences people.

Students will read The Magic School Bus: Wet All Over, discuss rain and the water cycle, go to Beacon Bluff to see the water cycle demonstrated in the rain garden, and then go back and create "mountain landscape collages" to convey the natural movement of water in nature. Be sure to make one as a demo for your students.

Learning Expectations

- I can observe, record, and recognize that water can be a solid or a liquid and can change from one shape to another.
- I can identify cause and consequences of human impact on the environment and the ways the environment influences people.
- I can identify the tools, materials, and techniques from a variety of 2 and 3-dimensional media such as drawings, printmaking, ceramics, or sculpture.
- I can identify the elements of visual arts including color, line, slope, texture, and space.
- I can create original 2 and 3-dimensional artworks to express ideas, expenses, or stories

Supplies

- grey and white construction paper
- scissors
- white tempera paint
- white crayon
- green, blue, and brown tissue paper (various shades)
- tempera cakes (various shades of blue)
- hot air balloons (to be decorated, cut, and pasted)
- glue sticks, pencils, rulers
- stapler
- Bag of Ice cubes
- Clear plastic cups, water, markers (to mark cup)
- The Magic Schoolbus: Wet All Over – Pat Relf

Time: (Min)	**Introduction/Prior Knowledge:** Mental Set ("the hook"): Divide students into pairs, give each pair an ice cube and ask them to find the fastest way to melt the ice cube. Have students time their method, then meet together and discuss and share their experiences and which method was the best.
Time:	**Sharing the Purpose/Objectives (What's in it for the? Why should they participate?):** Today we will learn about how water can change from a solid to a liquid to an invisible gas. All living things need water to survive, and water is a major part of our environment. It is important that we know how our actions affect water in the environment.
Time: Groupings: (If necessary) Supplies	**Lesson:** • In the same pairs as before, give each a plastic cup. Ask them to first write their names on the top of the cup, then ask that they fill the cup halfway with water. Have the pairs to draw a line on the cup to mark the top of the water. Have the students place the cups in a sunny spot by the window. The students will go back and measure the water level in the cups the next day. • Read the book *The Magic Schoolbus: Wet All Over*; afterwards, ask discuss what were some things they knew that were confirmed in the story, and things they didn't know. • Take the class to the Beacon Bluff to see the water cycle demonstrated through the Rain Garden. Ask students to find examples of the different stages in water. Ask them why they thing the rain garden helps the plants and how it benefits the plants. • Back in the classroom, discuss with students how mountains look (show a picture). Compare to zigzags and triangle as being "symbols" for mountains. Give students grey construction paper and pencils to draw mountain skylines (mountains should be drawn going across the middle part of the paper), then ask them to cut the paper at the mountain line and dot the top of the mountains with white tempera paint for snow. • On white paper, ask them to draw clouds and wind with the white crayon. Students will then crumple the paper and paint a wash with the various shades of blue tempera cakes. The white crayon should appear through the paint. • After the sky paintings are dry, staple the gray mountains to the blue sky. Have students create and cut out a hot air balloon or birds. Discuss with students how to make parts of the picture look closer and farther away, then ask them to draw landscapes closer in view at the bottom of the gray mountain paper. After being drawn with pencil, the students will "color" the landscape by using tissue paper and glue to make textural water, grass, trees, etc.
Time: Groupings:	**Closure (sharing what was learned):** After the mountain collages have dried, let the students have a gallery walk around the class to admire each other's work. As a group, discuss with students where the various stages of water are in their pictures. Then ask how people can impact the environment. Discuss.
Notes/Reminders/Homework Assigned:	
Lesson Reflections (successes, challenges, changes, next steps):	

Diagnostic Assessment

- ✓ Observation
- ✓ Anecdotal Notes
- ✓ Interview
- ☐ Surveys
- ☐ Test/Quiz
- ✓ Questionnaires
- ✓ KWL (know, want to know, learned)

Formative Assessment

- ✓ Observation
- ✓ Anecdotal Notes
- ✓ Work Samples
- ☐ Test/Quiz
- ☐ Checklist
- ☐ Conference
- ☐ Peer Assessment
- ☐ Self Assessment

Summative Assessment

- ☐ Rubric
- ☐ Unit Test
- ☐ Self Assessment
- ☐ Peer Assessment
- ✓ Learning Log/Journal
- ✓ Projects
- ☐ Presentation
- ☐ Reports (oral/written)

Purpose:

- ✓ Mental Set
- ✓ Sharing Purpose/Objectives
- ✓ Input
- ✓ Modeling
- ✓ Checking for Understanding
- ✓ Guided Practice
- ☐ Independent Practice
- ☐ Closure

Collaborative/Social Skills:

- ✓ Participate Fully
- ✓ Listening Attentively
- ✓ Expressing Appreciation
- ✓ Reflecting on Experience
- ✓ Valuing Diversity
- ✓ Thinking Constructively
- ✓ Making Responsible Decisions
- ✓ Resolving Conflict
- ✓ Solving Problems Creatively
- ☐ Working on Tasks Together
- ✓ Celebrating Achievement

Accommodations/Modifications

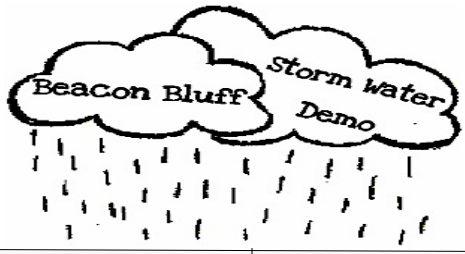
- ✓ Increase time, space, amount
- ✓ Decrease
- ✓ Change
- ✓ Scribe
- ✓ Oral Explanations
- ✓ Peer tutor/Partner
- ✓ Use manipulative

Blooms Taxonomy:

- ✓ Knowledge
- ✓ Understanding
- ✓ Application
- ✓ Analysis
- ✓ Synthesis
- ✓ Evaluation

Multiple Intelligences:

- ☐ Linguistic
- ✓ Spatial
- ✓ Interpersonal
- ✓ Logical/Mathematical
- ☐ Bodily/Kinesthetic
- ☐ Musical
- ✓ Naturalistic
- ✓ Intrapersonal



Lesson

Moving Water Paddle Power

Curriculum Areas/Strand/Grade Level:

Science: 2.1.2.2.1, 2.1.2.2.2, 2.1.2.2.3, 2.2.1.1.1, 2.2.2.1.1, 2.2.2.1.2/2nd grade
Social Studies: 2.2.3.5.1, 2.3.1.1.3/2nd grade
Art: 0.2.1.5.1/2nd grade

Project

(Or, Background and Introduction)

In this project, students will discover that moving water produces energy. They will visit Beacon Bluff and see the storm water demo and rain garden for examples of water. They will use this knowledge to explain the operation of a waterwheel. Students will then be put into pairs and given the challenge of creating their own self-propelling boat. Note: if you can find grade-appropriate reading material about paddle-wheelers or the grain industry in Minnesota, this lesson may also satisfy the English Language Arts standards for informational text.

Learning Expectations

- I can identify a need or problem and construct an object that helps solve it.
- I can describe why some materials are better than others for making a particular object and how materials can be better or worse.
- I can explain how engineered or designed items from every day life benefit people
- I can classify materials that come from nature as natural resources; tools, equipment, and factories as capital resources; and workers as human resources
- I can use maps, photos, or other geographic tools to identify major landmarks or major physical features of the United States
- I can describe objects in terms of color, size, shape, and the types of materials in the object.
- I can demonstrate that objects move in a variety of ways.
- I can create original 2 and 3-dimensional artworks

Supplies

- Clear, wide bucket or medium/large storage container with water
- paper and pencils
- Various materials for students to choose from to help them create and decorate their boats:
  - Cardboard boxes, plastic water/soda bottles, Styrofoam cups or small containers, milk/juice cartons, plastic cups
  - Rulers
  - Markers
  - Scissors
  - Rubber bands (lots)
  - Duct tape
  - Popsicle sticks/tongue depressors
  - Glue
  - Ping pong balls
  - Hole punch
  - Paper clips

Time: (Min)	**Introduction/Prior Knowledge:** Mental Set ("the	Introduce to students by showing pictures of examples of still water (lakes) and moving water (Niagara Falls). Explain that both pictures contain water, and ask students to explain what is different. Ask, "Where else have you seen moving water?" Review moving water can be a source of energy. Visit Beacon Bluff to observe the water demos.
Time:	**Sharing the Purpose/Objectives (What's in it for the? Why should they participate?):** We will talk about how water can make energy. We use water movement to create energy, which helps us in many ways.	
Time: Groupings: (If necessary) Supplies	○ Using a map, ask students what famous river is here in the Twin Cities. Then show a picture of a Mississippi paddle-wheeler. Ask if any students have ever seen it before? Explain that a long time ago, people used paddle-wheelers to send grain from Minnesota all the way down to New Orleans (which still happens today). People also used them to go on vacations up and down the Mississippi on big boat hotels called paddle-wheelers. Do a Google search beforehand to show pictures of old and current day paddle wheelers as well as pictures of what they looked like inside (www.Americancruiselines.com has a great picture of the Queen of the Mississippi paddle-wheeler that can give students an idea of how big they were and their features). Ask students what part of the boat uses water to create energy to move the boat? Show a picture of a paddle wheel and ask students how do the paddles help the boat move? With the clear bucket of water, use your hand to replicate the motion of a paddle wheel by cupping your hand and dragging it through the water from one side of the bucket to the next. Let each student come up and try on their own to feel the momentum and movement of the water being pushed. ○ Put students into pairs. Explain to them their challenge: create a boat that will water to make energy and move it. Tell the students that their boats will all be tested to see if they can use water to create energy or not, so to be sure that their boats can definitely float. ○ Show the students all of the supplies and materials that they may choose from. Give them two major clues: to think about how paddlewheeler boats move and that they will all need at least one rubber band. Show the students the various types of materials that can be used to create their boats. Give students GOOS (Good On One Side) paper to use to sketch out their idea a design before starting to create their boat. Tell students that before they decide to use anything to both come up and look at the materials carefully. ○ Tell students that before they can move on to constructing their boats to show you their design for final approval. Give students constructive criticism, but do not specifically change their design. ○ After getting your design approval, students can then begin constructing their boats. This may need to be finished the next day. Walk around and assist students as needed, making accommodations/modifications when necessary. Engage each pair in conversation about what they are doing, give constructive feedback and ask questions. ○ Keep a bucket of water available for students to test their boats ○ When the boats are completed, gather the students together so that each pair may present their boat and explain their design, then test it. Be sure that after each pair attempts their boat that everyone applauses their effort.	
Time: Groupings:	**Closure (sharing what was learned):** Be sure to make your own boat but do not s how it to students. For instructions, go to http://www.youtube.com/watch?v=Wy1RUskWxqk. Before you do your demonstration, explain to students that there are many ways you can design the boats or the paddle and that your way isn't the only right way. Show your paddle boat. Afterwards, as a group, ask students how using water energy helps people? Then ask students to independently fill out the Recording My Observations worksheet. Have the students return the sheets to you, then meet as a group to discuss what was learned. Afterwards, use the rubric worksheet to record your own observations on the pair work.	

Notes/Reminders/Homework Assigned:

Lesson Reflections (successes, challenges, changes, next steps):

Diagnostic Assessment	Formative Assessment	Summative Assessment
✓ Observation ✓ Anecdotal Notes ✓ Interview ☐ Surveys ☐ Test/Quiz ☐ Questionnaires ☐ KWL (know, want to know, learned)	✓ Observation ✓ Anecdotal Notes ✓ Work Samples ☐ Test/Quiz ☐ Checklist ☐ Conference ☐ Peer Assessment ☐ Self Assessment	✓ Rubric ☐ Unit Test ☐ Self Assessment ☐ Peer Assessment ☐ Learning Log/Journal ✓ Projects ☐ Presentation ✓ Reports (oral/written)

Purpose:

- ✓ Mental Set
- ✓ Sharing Purpose/Objectives
- ✓ Input
- ✓ Modeling
- ✓ Checking for Understanding
- ✓ Guided Practice
- ☐ Independent Practice
- ☐ Closure

Collaborative/Social Skills:

- ✓ Participate Fully
- ✓ Listening Attentively
- ✓ Expressing Appreciation
- ✓ Reflecting on Experience
- ✓ Valuing Diversity
- ✓ Thinking Constructively
- ✓ Making Responsible Decisions
- ✓ Resolving Conflict
- ✓ Solving Problems Creatively
- ✓ Working on Tasks Together
- ✓ Celebrating Achievement

Accommodations/Modifications

- ✓ Increase time, space, amount
- ✓ Decrease
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Blooms Taxonomy:

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Multiple Intelligences:

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- ✓ Spatial
- ✓ Interpersonal
- ✓ Logical/Mathematical
- ☐ Bodily/Kinesthetic
- ☐ Musical
- ☐ Naturalistic
- ✓ Intrapersonal

Name: _____

RECORDING MY OBSERVATIONS ABOUT WATER WHEELS

1. What made the water wheel rotate?

_____

_____

_____

2. What happened to the water wheel when:

Water	Test 1	Test 2	Test 3
water was still (not moving)			
water was moving slowly			
water was moving quickly			

3. What happened when an object was attached to the axle of the water wheel?

_____

_____

_____

4. What could you do to improve your water wheel?

_____

_____

_____

CHECKLIST FOR WATER WHEEL ACTIVITY

Name of Student: _____ Date: _____

Criteria	Yes	No
- follows directions accurately		
- creates a working water wheel		
- experiments constructively with the water wheel		
- works cooperatively with team		
- explains how the water wheel works		
- records observations clearly and precisely		
- generates ideas to make the water wheel more efficient		

Comments:

_____

_____

_____

_____

_____

Beacon Bluff

Rain Garden

Lesson

Understanding Plants

Curriculum Areas/Strand/Grade Level:

Science/3.1.1.2.1, 3.1.1.2.3, 3.4.1.1.1, 3.4.1.1.2, 3.4.3.2.1, 3.4.3.2.2/2nd grade
Art/0.1.1.5.1, 0.1.2.5.1, 0.2.1.5.1, 0.3.1.5.1/2nd grade

Project

(Or, Background and Introduction)

Students are learning about the structures of animals and plants, common groups based on physical characteristics and behaviors, and how all of this helps animals and plants survive.

In this lesson, students will go on a nature walk to Beacon Bluff to observe native plants and animals to Minnesota. Students will grow seeds in cd cases to how the various structure parts of a plant, then create dioramas of a natural environment found in Minnesota. This lesson will take several days.

Pictures from: "It's Time to Spill the Beans…" Julia, Leslie. *Two Busy Brunettes*. Wordpress. 8 March 2012. Web. 5 Nov. 2013.

Learning Expectations

- I can compare how structures of plants and animals serve various functions of growth, survival and reproduction.
- I can identify common groups of plants and animals using observable physical characteristics, structures, and behaviors.
- I can give examples of likenesses between adults and offspring in plants and animals that can be inherited or acquired.
- I can give examples of differences among individuals that can sometimes give an individual an advantage in survival and reproduction.
- I can generate questions that can be answered using scientific knowledge.
- I can maintain a record of observations, procedures, and explanations.
- I can create original 2 and 3-dimensional artworks to express ideas, experiences, or stories.
- I can share and describe a personal artwork

Supplies

- clear cd cases (pop out piece that holds cd in place), enough for 1 per pair
- potting soil
- lima beans (let pre-soak overnight)
- paint markers for labeling cd case and masking tape
- eye dropper (for watering beans)
- rulers, recording observation sheet
- Beacon's Bluff nature walk sheet, clipboards, pencils
- Tempura paints, construction paper, paintbrushes, newspaper, figurines, white paper, thread, scissors
- One shoebox per student

Time: (Min)	**Introduction/Prior Knowledge:** Mental Set ("the hook"): What do we know? As a whole class, students will brainstorm what they already know about local nature. After class discussion, have students fill out a K-W-L (What I Know, What I Want to know, What I have Learned) with the topic of plants. Students will identify what they want to learn as a question. Have the students add to the KWL chart throughout the lesson.
Time:	**Sharing the Purpose/Objectives (What's in it for the? Why should they participate?):** At the end of this lesson, you will make your own diorama, like the ones at the University of MN Bell Museum. They will show a nature scene from Minnesota. We will also learn about the structure of plants and how they help them survive.
Time: Groupings: (If necessary) Supplies	**Lesson:** - Go on a nature walk to Beacon Bluff and the rain garden. Give each student a clip board, pencil, and a copy of the Beacon Bluff observation sheet. Before setting out, ask students to predict four or five plants or animals they think they will see. - Back in the classroom, lead a discussion and have students name or describe the plants and animals they identified, observed, and recorded on their chart. Ask students to name other plants and animals they didn't find on the walk, but might find around Minnesota. Discuss observable characteristics of the plants and animals around Minnesota. In pairs, ask them to work together and identify some groups of plants and animals within each group. Ask them to describe what all plants in every group have the same. Elicit that all plants have the same parts – define parts with students on large poster/chart paper. - Put potting soil into cd case (about halfway at most) and a lima bean high in the soil, concave side down. Ensure the hinges of the cd case are at the top, that way they can be stood up and the soil will not fall out. It is also useful for watering the plants with droppers. Tape the bottom shut to ensure roots don't grow out the bottom and case cannot be opened. Use masking tape and permanent markers to label each plant with names. Water plants once every other day with dropper. Ensure they get plenty of sunlight. Day 5, un-tape the bottom of the cases overnight to give seeds space to grow. Re-tape in morning. Repeat, by day 7 you should be able to label plant with paint markers - After teaching students about animals in nature, if possible, take a trip to the Bell Museum to show students the dioramas painted by Walter J. Breckenridge. Otherwise, show examples via website. Tell students they will be creating their own nature in Minnesota dioramas. Have students paint the inside of their shoeboxes, and to paint a background scene for the back. Give students various different media to decorate their diorama's how they see fit (cutouts, actual plants, figurines, etc) - Creating a rubric for the diorama project is recommended
Time: Groupings:	**Closure (sharing what was learned):** Allow students to present their completed dioramas, then give students time to do a gallery walk to observe each other's work.
Notes/Reminders/Homework Assigned:	
Lesson Reflections (successes, challenges, changes, next steps):	

Diagnostic Assessment	Formative Assessment	Summative Assessment
✓ Observation ✓ Anecdotal Notes ✓ Interview ☐ Surveys ☐ Test/Quiz ☐ Questionnaires ✓ KWL (know, want to know, learned)	✓ Observation ✓ Anecdotal Notes ✓ Work Samples ☐ Test/Quiz ☐ Checklist ☐ Conference ☐ Peer Assessment ☐ Self Assessment	✓ Rubric ☐ Unit Test ☐ Self Assessment ☐ Peer Assessment ☐ Learning Log/Journal ✓ Projects ✓ Presentation ☐ Reports (oral/written)

Purpose:	Collaborative/Social Skills:
✓ Mental Set ✓ Sharing Purpose/Objectives ✓ Input ✓ Modeling ✓ Checking for Understanding ✓ Guided Practice ✓ Independent Practice ✓ Closure	✓ Participate Fully ✓ Listening Attentively ✓ Expressing Appreciation ✓ Reflecting on Experience ✓ Valuing Diversity ✓ Thinking Constructively ✓ Making Responsible Decisions ✓ Resolving Conflict ✓ Solving Problems Creatively ✓ Working on Tasks Together ✓ Celebrating Achievement

Accommodations/Modifications	Blooms Taxonomy:	Multiple Intelligences:
✓ Increase time, space, amount ✓ Decrease ✓ Change ✓ Scribe ✓ Oral Explanations ✓ Peer tutor/Partner ✓ Use manipulative	✓ Knowledge ✓ Understanding ✓ Application ✓ Analysis ✓ Synthesis ✓ Evaluation	✓ Linguistic ✓ Spatial ✓ Interpersonal ✓ Logical/Mathematical ☐ Bodily/Kinesthetic ☐ Musical ✓ Naturalistic ✓ Intrapersonal

Name _____

Beacon Bluff Nature Walk Recording Chart

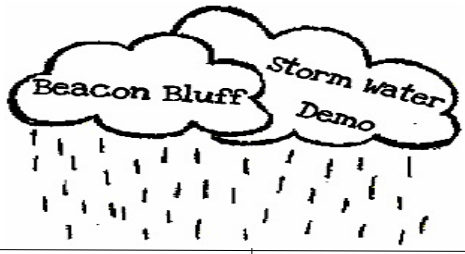
Predict:	Observe and Record:
What plants and animals do you <u>think</u> you will see?	Name/Draw the plants and animals you saw

Name: _____

HOW TO GROW BEANS

Date	Observation	Measurement	Bean Plant Drawing

Use this chart to record changes in your bean plant. Write an observation and draw a picture to show the changes.Be sure to note when the root and shoot first appear. Use a ruler to measure growth in your plant.



Lesson

The Storm Water Story

Curriculum Areas/Strand/Grade Level:

Language Arts: 3.1.1.1, 3.1.2.2, 3.1.3.3, 3.2.3.3, 3.10.1.1/3rd grade
Art: 0.2.1.5.1, 0.3.1.5.1/3rd grade

Project

(Or, Background and Introduction)

In this lesson, students will listen to Ojibwe stories, discuss the meaning of the stories, observe story art, and interpret the story told at the storm water art demo at Beacon Bluff. Students will then paint their story on large posterboard and write a short explanation of the story their painting is trying to tell.

Learning Expectations

- I can ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for answers
- I can recount stories, including fables, folktales, and myths from diverse cultures; determining the central message, lesson, or moral and explain how its conveyed through key details
- I can describe characters in a story and explain how their actions contribute to the sequence of events
- I can describe the relationship between a series of historical events, scientific ideas or concepts using language that pertains to time, sequence, cause/effect
- I can demonstrate command of the conventions of standard English grammar and usage when writing or speaking
- I can create original 2 or 3-dimensional art
- I can show and describe a personal artwork

Supplies

- Ojibwe stories: http://www.youtube.com/watch?v=M7RULN6cRk8 (fast forward to 17:40 and 32:50) http://www.youtube.com/watch?v=Etn92Ms8plo&list=PLE2AD6397275D905F&index=35
- *Painting Tomorrow's Dream* by Roy Thomas http://www.d.umn.edu/tma/collections/stories/cat09.html (use activity on page). Print examples of different work of his to distribute/show to students
- Brushes
- Acrylic paints
- Poster paper (one per student), clip boards, paper

Time: (Min)	**Introduction/Prior Knowledge:** Mental Set ("the hook"): Show students numerous examples of Roy Thomas' stories as art (simple Google image search will suffice). As a class, have students brainstorm what story each picture is trying to tell. Put students into small groups, give each group a copy of one of Roy Thomas' paintings, have them record their interpretation of the story to share with the class.
Time:	**Sharing the Purpose/Objectives (What's in it for the? Why should they participate?):** Students will listen to traditional Ojibwe stories, discuss the stories, look at examples of stories as art, go to Beacon Bluff and observe the storm water demo and the story being told by the art piece, and finally paint their interpretation of the art piece at the storm water demo.
Time: Groupings: (If necessary) Supplies	**Lesson:** - Play for students one of the Ojibwe stories from the youtube links recommended. After the story, have students answer comprehension questions about the story, such as overall theme, lesson learned, why the story was important, etc. Allow students to draw a sketch of their interpretation of the story. - Show students the picture by Roy Thomas on the Tweed Museum of Art website. Using the activity worksheet as your guide, write a few of the questions on the board for students to answer on their own. Come together as class and discuss briefly what was written, collect student answers. Ask the students about the possible choice of animals, colors, and symbols seen in the picture and how it adds to the story. - Give each student a clipboard, paper, and pencil, and visit Beacon Bluff and the storm water demo. This demo is also depicting a story. Ask students to write on their paper their interpretation of the story being told by the storm water demo, from beginning to end. - Once back in the classroom, explain to students that they will be creating a story as art, just like Roy Thomas, but about the storm water demo they just saw. Ask students to first write their full story. Students will then sketch their story idea first before painting it on the poster board paper.
Time: Groupings:	**Closure (sharing what was learned):** When paintings are all dry, allow the students to present their story art, tell their story, and explain their choice in how to depict the story. Come together as a class and have a quick discussion over what was learned and why stories as art can be important.
Notes/Reminders/Homework Assigned:	
Lesson Reflections (successes, challenges, changes, next steps):	

Diagnostic Assessment	Formative Assessment	Summative Assessment
✓ Observation ✓ Anecdotal Notes ✓ Interview ✓ Surveys ☐ Test/Quiz ☐ Questionnaires ☐ KWL (know, want to know, learned)	✓ Observation ✓ Anecdotal Notes ✓ Work Samples ☐ Test/Quiz ☐ Checklist ☐ Conference ☐ Peer Assessment ☐ Self Assessment	☐ Rubric ☐ Unit Test ☐ Self Assessment ☐ Peer Assessment ☐ Learning Log/Journal ✓ Projects ✓ Presentation ✓ Reports (oral/written)

Purpose:

- ✓ Mental Set
- ✓ Sharing Purpose/Objectives
- ✓ Input
- ✓ Modeling
- ✓ Checking for Understanding
- ✓ Guided Practice
- ☐ Independent Practice
- ☐ Closure

Collaborative/Social Skills:

- ✓ Participate Fully
- ✓ Listening Attentively
- ✓ Expressing Appreciation
- ✓ Reflecting on Experience
- ✓ Valuing Diversity
- ✓ Thinking Constructively
- ✓ Making Responsible Decisions
- ✓ Resolving Conflict
- ✓ Solving Problems Creatively
- ☐ Working on Tasks Together
- ✓ Celebrating Achievement

Accommodations/Modifications

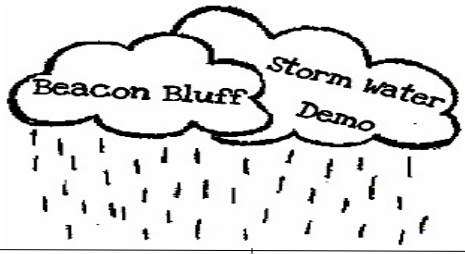
- ✓ Increase time, space, amount
- ✓ Decrease
- ✓ Change
- ✓ Scribe
- ✓ Oral Explanations
- ✓ Peer tutor/Partner
- ✓ Use manipulative

Blooms Taxonomy:

- ✓ Knowledge
- ✓ Understanding
- ✓ Application
- ✓ Analysis
- ✓ Synthesis
- ☐ Evaluation

Multiple Intelligences:

- ✓ Linguistic
- ✓ Spatial
- ✓ Interpersonal
- ☐ Logical/Mathematical
- ☐ Bodily/Kinesthetic
- ☐ Musical
- ✓ Naturalistic
- ✓ Intrapersonal



Lesson

Storm Water Pollution Solution

Curriculum Areas/Strand/Grade Level:

Science: 3.1.1.2.1, 3.1.1.2.4/3rd grade
Social Studies: 3.1.1.1.1/3rd grade
Art: 0.1.1.5.1, 0.2.1.5.1, 0.3.1.5.1/3rd grade

Project

(Or, Background and Introduction)

In this lesson, students will learn about the importance of keeping water clean, the effects of storm water pollution, and will simulate the steps in the water-treatment process. They will then make water conservation collage posters to be hung up around the school in bathrooms and at water fountains to remind others about the importance of water conservation and protection.

Learning Expectations

- I can identify the ways people make a difference in the civic life of their communities, state, nation, or world by working as individuals or groups to address specific problems or needs
- I can generate questions that can be answered when scientific knowledge is combined with knowledge gained from one's own observations or investigations
- I can construct reasonable explanations based on evidence collected from observations or experiments
- I can identify the elements of visual arts
- I can create original 2 or 3-dimensional art
- I can show and describe a personal artwork

Supplies

- a large bucket of clean water
- two clear plastic cups
- green food coloring
- mud
- labeled containers with "pollutant material" (one per student), see last sheet for pollutants and their substitutes
- Clean-Up Kit: empty quart container for dirty water, dish basin, wire mesh kitchen strainer, funnel, coffee filter, plastic spoon, straw, eyedropper, sponge, quart sized plastic container for waste materials, plastic plant pot with holes on bottom, clear quart container for clean water, two bottles of pickling alum (available at supermarkets) – one kit per group
- Poster board, scissors, glue, magazines

Time: (Min)	Introduction/Prior Knowledge: Mental Set ("the hook"):	Have the whole class sit in a circle around a large bucket of water. Dip a clear plastic cup into the water and then pour the water back and forth between the two cups. Ask students to close their eyes, listen, and imagine their favorite place. What are they doing? While their eyes are closed, add green food coloring and mud to the cup of water and continue pouring.
Time:	Sharing the Purpose/Objectives (What's in it for the? Why should they participate?): Ask students to open their eyes. Discuss their reaction to the changes in the water. Tell them they will learn how water becomes polluted and how it is cleaned up again. Then, they will create collage posters to hang up around the school.	
Time: Groupings: (If necessary) Supplies	- Explain that the bucket of water represents a lake, which has slowly been polluted. Give each student a labeled container with the "pollution material". Tell the students that you are going to describe the lake and the pollutants that affect it. As each pollutant is mentioned in your story, have the students holding the corresponding pollutant dump the contents into the water jug. - Describe the lake: Back in 1960, only a dairy farm and apple orchard bordered the lake. Later, a small fishing access and parking lot were built to allow for public boating. A campground with a store and Laundromat followed and attracted many summer visitors. Then in the 1980's, summerhouses were built along the shore, and several are now under construction. The water quality has slowly changed over the years. Mention the farmer, whose fertilizers and manure are washed into the lake by the rain; the orchard, whose pesticides are washed into the lake by the rain; the motorboat driver/fishermen, whose fuel and engine exhaust enter the water; the campers, whose litter gets into the water; the campground Laundromat, whose washing machines' leaky underground drainpipe adds soapy water to the lake; the homeowner, whose household waste water drains into the lake; the new building sites, where erosion and runoff add sediments to the lake; the careless house painter; whose unused paint and turpentine sweets into the lake; and the motorist, whose car parked near the lake contributes polluting oil drips, antifreeze, and windshield washer fluid. By the end of your story, the water in the bucket should be dirty. Ask the students who polluted the lake? Who will clean it up? How? Discuss actions the students might take if they lived around the lake to prevent the pollution. - Divide class into small groups. Give each group a quart-sized container with dirty water from the bucket and a cleanup kit. Explain that they will play the role of the water-treatment plant to clean the lake. Explain that pickling alum will be available for anyone who wants to use it (only need ½ teaspoon. It will cause small particles to stick together). - Set a time limit and ask students to produce the cleanest water possible, using any or all of the materials in their kits. They should try to lose as little water as possible. Have them designate one recorder per group to write down cleanup steps. Have each group keep their cleanest water in the clean quart jar. - When time is up, gather the class together and place water side by side. Compare results and vote who had the cleanest water. Have that group come up and discuss their steps. - Go to Beacon's Bluff and visit the storm water demo. Ask students to observe the art piece and reflect how it compares to the clean water demo they just did. How can they see the effects of pollution? What are the effects of cleaning up the water? - Go back to the classroom and have the students create Clean Water Reminder posters using magazines. Make one ahead of time to demonstrate how to do it. Ask them to remember the message of their poster and to use bits of color to add depth, definition, and form.	
Time: Groupings:	Closure (sharing what was learned): Have students share their work and the message. Allow the students to hang up the posters around water fountains in the school. Meet with students as a group and review what was learned. Why is it important to protect water? What can you do at home to prevent water contamination? Visit the Beacon Bluff storm water demo, ask students to explain what the artist is saying in regards to water pollution and protection.	
Notes/Reminders/Homework Assigned:		
Lesson Reflections (successes, challenges, changes, next steps):		

Diagnostic Assessment	Formative Assessment	Summative Assessment
✓ Observation ✓ Anecdotal Notes ✓ Interview ☐ Surveys ☐ Test/Quiz ☐ Questionnaires ☐ KWL (know, want to know, learned)	✓ Observation ✓ Anecdotal Notes ✓ Work Samples ☐ Test/Quiz ☐ Checklist ☐ Conference ✓ Peer Assessment ✓ Self Assessment	☐ Rubric ☐ Unit Test ✓ Self Assessment ✓ Peer Assessment ✓ Learning Log/Journal ✓ Projects ✓ Presentation ✓ Reports (oral/written)

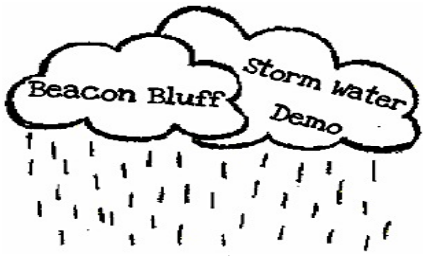
Purpose:	Collaborative/Social Skills:
✓ Mental Set ✓ Sharing Purpose/Objectives ✓ Input ✓ Modeling ✓ Checking for Understanding ✓ Guided Practice ☐ Independent Practice ☐ Closure	✓ Participate Fully ✓ Listening Attentively ✓ Expressing Appreciation ✓ Reflecting on Experience ✓ Valuing Diversity ✓ Thinking Constructively ✓ Making Responsible Decisions ✓ Resolving Conflict ✓ Solving Problems Creatively ✓ Working on Tasks Together ✓ Celebrating Achievement

Accommodations/Modifications	Blooms Taxonomy:	Multiple Intelligences:
✓ Increase time, space, amount ✓ Decrease ✓ Change ✓ Scribe ✓ Oral Explanations ✓ Peer tutor/Partner ✓ Use manipulative	✓ Knowledge ✓ Understanding ✓ Application ✓ Analysis ☐ Synthesis ☐ Evaluation	✓ Linguistic ✓ Spatial ✓ Interpersonal ✓ Logical/Mathematical ☐ Bodily/Kinesthetic ☐ Musical ✓ Naturalistic ✓ Intrapersonal

Pollutant Materials and Analogues

Use analogues as a replacement for actual pollutant materials.

Polluter and Pollutant Materials	Analogue
Farmer's Fertilizer and Manure	Corn starch and Soil
Orchard's Pesticides	Baking Soda
Motorboat Driver's Fuel and Oil	Vegetable Oil
Camper's Litter	Paper, Pieces of Tin Foil and Styrofoam Scraps
Laundromat's Soapy Water	Dish Detergent
Homeowner's Waste Water	Molasses
New Construction Site's Runoff	Soil
House Painter's Unused Paint and Turpentine	Food Coloring
Motorist's Leak	Vinegar



Lesson

Environmental Landscapes

Curriculum Areas/Strand/Grade Level:

Science: 4.1.2.1.1, 4.3.2.3.1, 4.3.4.1.1/4th grade
Social Studies: 4.3.4.9.1/4th grade
Art: 4.1.1.5.1, 4.1.1.5.2, 4.1.1.5.3, 4.1.3.5.1, 4.1.3.5.2, 4.2.1.5.1, 4.4.1.5.1/4th grade

Project (Or, Background and Introduction)

This lesson plan should be used as a supplement, or follow up lesson, for students who have already received introduction to precipitation, condensation, and evaporation. In it, students review the water cycle through the storm water demo at Beacon Bluff, then observe works of traditional Chinese landscape art, or *shui-mo hua* (水墨畫), that demonstrate examples of the water cycle (see pictures listed in Supplies section). After being shown the serene landscape paintings, the painting series, Let the Hills be Hills and the Rivers be Rivers, by Yong Liangyang will be shown and the differences between his interpretation of shui-mo hua paintings and those seen by others will be discussed. This is a crucial point to discuss the effects humans can have on the environment, including the quality of water and the water cycle.

Students will practice brush techniques used in shui-mo hua art, then create their own paintings similar in style and social/cultural context to Yong Liang Yang's pictures. An instructional video series and step-by-step instructions are included below.

- I can describe how the methods people utilize to obtain and use water in their homes and communities can affect water supply and quality.
- I can identify where water collects on Earth, and describe how water moves through the Earth system using the processes of evaporation, condensation, and precipitation.
- I can describe the positive and negative impacts that the designed world has on the natural world as more and more engineered products and services are created and used.
- I can explain how humans adapt to and/or modify the physical environment and how they are in turn affected by these adaptations and modifications.
- I can justify personal interpretations and reactions to works of visual arts
- I can create original 2 and 3-dimensional artworks
- I can describe how visual art communicates meaning
- I can describe personal, social, cultural, or historical contexts that influence the creation of visual artworks
- I can identify characteristics of Western and non-Western styles, movements, and gestures in art
- I can describe how the principals of visual art are used in the creation, presentation, and response in visual artworks
- I can describe the characteristics of the elements of visual arts

Supplies

- Wang Shimin "After Wang Wei's Snow Over Rivers and Mountains"
- Wen Zhengming "Eight Songs of the Xiao and Xiang Rivers"
- Wang Hui "Summer Mountains, Misty Rain"
- Ma Wan "Poetic Twilight Clouds"
- Yong Liangyang "Let the Hills be Hills and the Rivers be Rivers"
- Henry Li "Landscape Painting Tutorial: Grand Canyon with Split Brush Technique" (3 parts plus additional info videos) http://www.youtube.com/watch?v=Ov6iI_7hhBY
- Zhaofan Liu "Step-by-Step Chinese Painting Demonstration http://painting.about.com/od/stepbysteppaintingdemos/ss/Zhaofan_Liu.htm
- Old brushes of various size, preferably pointed tip/bamboo
- Scratch paper for practicing attempts
- Internet/computer/projector
- Rice paper or watercolor paper

Time: (Min)	Introduction/Prior Knowledge: Mental Set ("the hook"):	Quickly brainstorm as a class, "What are all the ways we use water other than to drink?" Write ideas down. Point out to students that most large cities are located near sources of water, and explain that humans have historically settled near water sources. Ask what water source is nearby the Twin Cities. Ask students to describe what they think the area looked like before the cities.
Time:	Sharing the Purpose/Objectives (What's in it for the? Why should they participate?):	The movements of the water cycle and water impacts our daily life. The quality of water in the environment eventually determines the quality of water that we use day to day. It is important to understand how we as humans can impact water and the water cycle.
Time: Groupings: (If necessary) Supplies	Lesson:	- Draw a sun and a body of water (eventually you will add land). Explain that the sunlight is hitting the water surface, causing the liquid on the surface to change into water vapor and become part of the air. Have a student illustrate this by drawing arrows representing water vapor evaporating up and label it "evaporation". - Explain that as the water vapors cool, it can become liquid water droplets. Because air cools as it rises, the rising vapor can form many droplets, resulting in clouds. Have a student draw a cloud over the water. Label it "condensation". - Ask "do clouds stay in one place?" When students answer no, explain that clouds move as the winds move. Have one student draw an area next to the ocean representing land. Have another student draw an arrow showing the cloud moving over the land. Explain that as air cools and more and more droplets form, they clump together and form heavy droplets, which eventually fall to Earth as rain, or, if it's cold, sleet, hail, or snow. Explain it is called precipitation and have a student label it. Have students draw different forms of precipitation falling from the cloud. - Ask what happens to the rain when it falls onto Earth. Some go to lakes, others rivers, and many the ocean. Some also falls on land and sinks into the ground. Or goes into sewers. Have students draw with arrows each area that the rain can call. Explain to students that their water cycle is complete. Visit the storm water demo at Beacon Bluff to show an artistic representation of the water system. - Back in the classroom, show pictures of various shui-mo hua art (except Yong Liangyang's). Explain how the pictures convey emotion in nature, and capture natural beauty found in nature. Ask students to point out the water cycle in the pictures and what caused them. - Ask students what happens to the rain and water in the cities? Ask what happens to the water if there are oil slicks on the road or when someone uses pesticides on their lawn when it rains. Discuss the negative effects we can have on water. - Show students Yong Liangyang's "Let the Hills be Hills and the Rivers be Rivers pictures". Ask them first what they notice. Then, have them take a closer look. Point out the cities and pollution in what at first seems to be a serene natural scene. Ask why the artist did that, especially since all shui-mo hua art depicts nature as being beautiful? - (before proceeding, be sure to watch the youtube video or the step-by-step guide on how to do shui mo hua paintings.) Show students the basics behind doing shui mo hua paintings. Let students practice on scratch paper. Explain to students that they will be doing their own interpretation of a shui-mo hua painting, also incorporating the water cycle, but similar to that of Yong Liangyang. They must think of their own natural environment when doing their paintings. Be sure that each student has access to the multiple sized brushes, water, and watercolor paint. Have students first sketch out their idea on scratch paper before doing their final copy on the watercolor paper. Once students are done, have them put them aside to dry. Put weights on the paper while it dries to prevent it from curling.
Time: Groupings:	Closure (sharing what was learned): Let students present their art to the class, explaining what they did and why they painted what they painted. Ask each student to point out to examples of the water cycle in their paintings and what stage the item is in.	
Notes/Reminders/Homework Assigned:		
Lesson Reflections (successes, challenges, changes, next steps):		

Diagnostic Assessment	Formative Assessment	Summative Assessment
✓ Observation ✓ Anecdotal Notes ☐ Interview ☐ Surveys ☐ Test/Quiz ☐ Questionnaires ☐ KWL (know, want to know, learned)	✓ Observation ✓ Anecdotal Notes ✓ Work Samples ☐ Test/Quiz ☐ Checklist ☐ Conference ☐ Peer Assessment ☐ Self Assessment	☐ Rubric ☐ Unit Test ☐ Self Assessment ☐ Peer Assessment ☐ Learning Log/Journal ✓ Projects ✓ Presentation ☐ Reports (oral/written)

Purpose:	Collaborative/Social Skills:
✓ Mental Set ✓ Sharing Purpose/Objectives ✓ Input ✓ Modeling ✓ Checking for Understanding ✓ Guided Practice ☐ Independent Practice ☐ Closure	✓ Participate Fully ✓ Listening Attentively ✓ Expressing Appreciation ✓ Reflecting on Experience ✓ Valuing Diversity ✓ Thinking Constructively ✓ Making Responsible Decisions ✓ Resolving Conflict ✓ Solving Problems Creatively ✓ Working on Tasks Together ✓ Celebrating Achievement

Accommodations/Modifications	Blooms Taxonomy:	Multiple Intelligences:
✓ Increase time, space, amount ✓ Decrease ✓ Change ✓ Scribe ✓ Oral Explanations ✓ Peer tutor/Partner ✓ Use manipulative	✓ Knowledge ✓ Understanding ✓ Application ✓ Analysis ✓ Synthesis ☐ Evaluation	☐ Linguistic ✓ Spatial ✓ Interpersonal ✓ Logical/Mathematical ✓ Bodily/Kinesthetic ☐ Musical ✓ Naturalistic ✓ Intrapersonal

Beacon Bluff

Rain Garden

Lesson

Making Rain: How Do Cultures Around the World "Make" and Celebrate Rain?

Curriculum Areas/Strand/Grade Level:

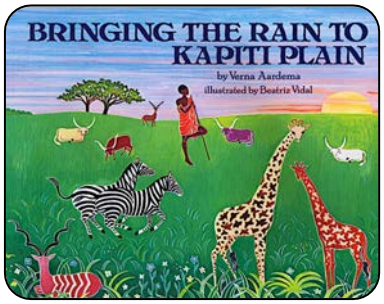
Science/4.3.2.3.1/4th grade
Art/4.1.1.5.1, 4.1.1.5.3, 4.1.3.2.1/4th grade
Social Studies/4.3.4.9.1/4th grade

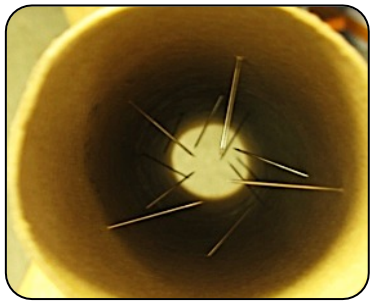
Project

(Or, Background and Introduction)

Students have learned how water is fundamental to everyday life. In this lesson, students will experience rain, the water cycle, and how rain is an important part of various cultures and traditions.

The students will learn further how rain and the water cycle is important on our daily life, and how other cultures have adapted their cultures and traditions to the rain cycle.





Learning Expectations

- I can explain how humans adapt to and/or modify the physical environment and how they are in turn affected by these adaptations and modifications
- I can identify where water collects on Earth, including atmosphere, ground, and surface water, and describe how water moves through the Earth system using the process of evaporation, condensation, and precipitation.
- I can describe the characteristics of the elements of visual art including color, line, shape, value, form, and texture
- I can identify characteristics of Western and non-Western styles, movements, and genres in art

Supplies

-Projector
-PBS Reading Rainbow episode *Bringing the Rain to Kapiti Plain* (locate Kenya on map)
-tv/vcr/dvd
-Cardboard tubes, straight pins or nails, contact paper, extra cardboard, packing tape, dried beans/popcorn kernels, paint/permanent markers
- a rain poem (one that can have a rain stick sound in it)

Time: (Min)	Introduction/Prior Knowledge: Mental Set ("the hook"):	Play the rain game, discuss student observations, review importance of rain/water cycle, read or show *Bringing the Rain to Kapiti Plain* (how did the plain change after the rain comes?)
Time:	Sharing the Purpose/Objectives (What's in it for the? Why should they participate?): We will learn further how rain and the water cycle is important on our daily life, and how other cultures have adapted their cultures and traditions to the rain cycle.	
Time: Groupings: (If necessary) Supplies	Lesson: • Take students to Beacon Bluff, let them observe and interact with the demo area. Afterwards, go back and discuss how the art piece is our modern interpretation of the rain cycle. • Introduce rain sticks – show students where Chile is on the map, explain to them that Chileans used rain sticks to encourage rain to fall. • Make rain sticks: o Recruit parent helpers, if possible! o Draw a spiral down the length of a cardboard tube, starting at one end of the tube and ending at the other. Do not follow the natural seam. o Along the spiral, insert straight pins or small nails. The length of the nails or pins should be slightly less than the diameter of the cardboard tube. o Cover the cardboard tube (and pin or nail heads) with contact paper. o Close off one end of the tube with cardboard or a cap. Seal it in place with clear packing tape. o Put dried beans, rice, and/or un-popped popcorn into the tube. o Holding your hand over the open end of the tube, listen for the rain. Add or remove dried materials, as necessary. o Seal the other end of the tube with cardboard/cap and tape. o Decorate the rain stick with paints and permanent markers, if desired. • Perform a rain poem – encourage students to respond to each line or phrase with their rain sticks. Have students write their own rain poem and perform using their rain sticks	
Time: Groupings:	Closure (sharing what was learned):	
Notes/Reminders/Homework Assigned:		
Lesson Reflections (successes, challenges, changes, next steps):		

Diagnostic Assessment	Formative Assessment	Summative Assessment
✓ Observation ✓ Anecdotal Notes ✓ Interview ☐ Surveys ☐ Test/Quiz ☐ Questionnaires ☐ KWL (know, want to know, learned)	✓ Observation ✓ Anecdotal Notes ✓ Work Samples ☐ Test/Quiz ☐ Checklist ☐ Conference ☐ Peer Assessment ☐ Self Assessment	☐ Rubric ☐ Unit Test ☐ Self Assessment ☐ Peer Assessment ☐ Learning Log/Journal ✓ Projects ☐ Presentation ☐ Reports (oral/written)

Purpose:

- ✓ Mental Set
- ✓ Sharing Purpose/Objectives
- ✓ Input
- ✓ Modeling
- ✓ Checking for Understanding
- ☐ Guided Practice
- ✓ Independent Practice
- ☐ Closure

Collaborative/Social Skills:

- ✓ Participate Fully
- ✓ Listening Attentively
- ✓ Expressing Appreciation
- ✓ Reflecting on Experience
- ✓ Valuing Diversity
- ✓ Thinking Constructively
- ✓ Making Responsible Decisions
- ☐ Resolving Conflict
- ✓ Solving Problems Creatively
- ✓ Working on Tasks Together
- ✓ Celebrating Achievement

Accommodations/Modifications

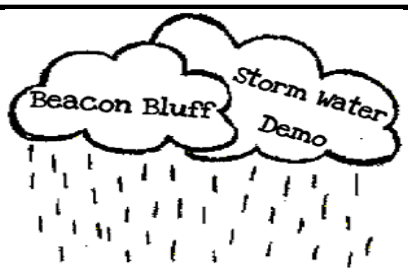
- ✓ Increase time, space, amount
- ✓ Decrease
- ☐ Change
- ☐ Scribe
- ✓ Oral Explanations
- ☐ Peer tutor/Partner
- ☐ Use manipulative

Blooms Taxonomy:

- ✓ Knowledge
- ✓ Understanding
- ✓ Application
- ✓ Analysis
- ✓ Synthesis
- ✓ Evaluation

Multiple Intelligences:

- ✓ Linguistic
- ✓ Spatial
- ✓ Interpersonal
- ✓ Logical/Mathematical
- ☐ Bodily/Kinesthetic
- ✓ Musical
- ✓ Naturalistic
- ✓ Intrapersonal



Lesson

Design Solution with Zero Footprint: how is Beacon Bluff not harming the environment?

Curriculum Areas/Strand/Grade Level:

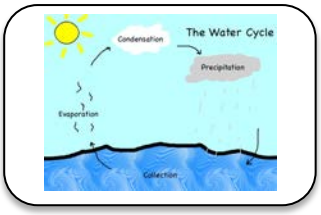
Science /4.1.2.1.1, 4.1.2.2.2, 4.3.2.3.1, 4.3.4.1.1/ 4th grade
Art / 4.1.2.5.1, 4.1.3.5.2 / 4th grade

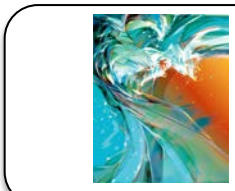
Project

(Or, Background and Introduction)

Beacon Bluff is an example of modern technology and innovation that is not harming the environment. The technology and art displayed is also not harming the environment. The storm water demo art piece portrays the movement of water; it's importance to the environment, and our impact on it.

Students will observe the storm water structure, which shows an artistic interpretation of the movement of water, incorporating technology and innovation that doesn't hurt the environment. They will observe the demo mechanisms and meaning from the art piece to create their own artistic interpretation of technology and innovation in the use of water for our needs.





Learning Expectations

- I can design experiments
- I can use evidence to form conclusions and demonstrate an understanding of concepts
- I know the importance of water in our lives
- I know how water is used to do work
- I know the water cycle and its properties
- I can describe tools, materials, and techniques used in a variety of two and three-dimensional media
- I can describe how art communicates meaning

Supplies

- clip boards
- pencil, paper, eraser
- (art materials decided by teacher for constructing artistic representation of technology and innovation working in the environment; suggestion for limited time is to have students do drawing blueprints instead of sculptures)

Time: (Min)	**Introduction/Prior Knowledge:** Mental Set ("the hook"): After teaching students about the water cycle and properties of water, begin discussing our uses of water – how do we get water? How does technology and innovation shape how we obtain and use water? What impact does it have on the environment?
Time:	**Sharing the Purpose/Objectives (What's in it for the? Why should they participate?):** Students will observe a demo structure, which shows an artistic interpretation of the movement of water, incorporating technology and innovation that doesn't hurt the environment. They will observe the demo mechanisms and meaning from the art piece to create their own artistic interpretations in technology and innovation in the use of water for our needs.
Time: **Groupings: (If necessary)** Individual Small group Whole class **Supplies** Clipboards Paper/ pencils Art medium Art tools	**Lesson:** • Take students to Beacon Bluff; give a clipboard and pencil to each student with the handout. Ask them to first observe and interact with the demo, then sketch parts of the demo that interests them/they could use as inspiration for their own artistic interpretations. • Go back to the classroom, have several small group discussions where the students can talk about what they learned. Come together for a large class share and discuss. • Decide on a medium (or various mediums) students can use for their art pieces. One suggestion is to have students bring in recycled goods (such as milk cartons, egg cartons, etc.) to use as their medium for this project. If time is limited, ask your students to design a "blueprint" of their art idea. • Students will need to write a short paragraph, with a name for their art piece, and a short description of what it is and why.
Time: **Groupings:**	**Closure (sharing what was learned):** Have students place their art on their desktop with the paragraph description, then invite your students to go on a "gallery walk" around the room. Afterwards, come together to discuss what was learned, something students noticed about each other's work, and why environmentally friendly technology and innovation is important.
Notes/Reminders/Homework Assigned:	
Lesson Reflections (successes, challenges, changes, next steps):	

Diagnostic Assessment	Formative Assessment	Summative Assessment
✓ Observation ✓ Anecdotal Notes ☐ Interview ☐ Surveys ☐ Test/Quiz ☐ Questionnaires ✓ KWL (know, want to know, learned)	✓ Observation ✓ Anecdotal Notes ✓ Work Samples ☐ Test/Quiz ☐ Checklist ☐ Conference ☐ Peer Assessment ☐ Self Assessment	☐ Rubric ☐ Unit Test ☐ Self Assessment ☐ Peer Assessment ☐ Learning Log/Journal ☐ Projects ✓ Presentation ☐ Reports (oral/written)

Purpose:	Collaborative/Social Skills:
✓ Mental Set ☐ Sharing Purpose/Objectives ☐ Input ☐ Modeling ✓ Checking for Understanding ☐ Guided Practice ☐ Independent Practice ☐ Closure	✓ Participate Fully ✓ Listening Attentively ✓ Expressing Appreciation ✓ Reflecting on Experience ✓ Valuing Diversity ✓ Thinking Constructively ☐ Making Responsible Decisions ☐ Resolving Conflict ✓ Solving Problems Creatively ☐ Working on Tasks Together ✓ Celebrating Achievement

Accommodations/Modifications	Blooms Taxonomy:	Multiple Intelligences:
✓ Increase time, space, amount ☐ Decrease ✓ Change ☐ Scribe ✓ Oral Explanations ✓ Peer tutor/Partner ✓ Use manipulative	✓ Knowledge ✓ Understanding ✓ Application ✓ Analysis ✓ Synthesis ✓ Evaluation	✓ Linguistic ✓ Spatial ✓ Interpersonal ✓ Logical/Mathematical ☐ Bodily/Kinesthetic ☐ Musical ✓ Naturalistic ☐ Intrapersonal

Beacon Bluff

Rain Garden

Lesson

Can We Control Nature?

Curriculum Areas/Strand/Grade Level:

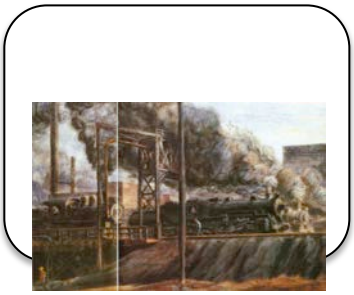
Science/4.2.1.2.2, 4.3.2.3.1,4.3.4.1.1/4th grade
Art/4.1.1.5.2, 4.1.3.5.2, 4th

Project

(Or, Background and Introduction)

Students have been learning about the properties of water and how it is used to do work. This is a project to further discuss the properties of water, how humans use water, and characteristics of water.

Students will use artistic images to further understand the characteristics of water, the water cycle, and how humans use water in daily life. From this, they will observe the art pieces incorporating water at Beacon Bluff, make their own artistic piece, then do a gallery walk.



Learning Expectations

- I can describe how art communicates meaning and justify personal interpretations and reactions to works of visual art
- I can create original 2 or 3-dimensional artwork to express artistic ideas
- I can describe how methods people use to obtain and use water can affect the environment
- I can explain and understand water systems and how the states of matter changes

Supplies

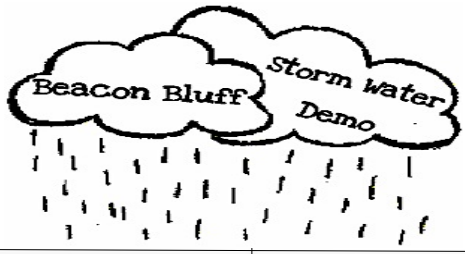
- artworks: Hokusai's *The Great Wave off Kanagawa, Lobster Trap and Fish Tail* by Alexander Calder, and *Locomotive*s by Reginald Marsh
- painting material (either watercolor, acrylic, or tempera)
- camera

Time: (Min)	Introduction/Prior Knowledge: Mental Set ("the hook"):	Go on field trip to Beacon Bluff, look at the art work/how the artist incorporated innovation/technology to represent how humans are connected to water.
Time:	Sharing the Purpose/Objectives (What's in it for the? Why should they participate?): We will use artistic images to further understand the characteristics of water, the water cycle, and how humans use water in daily life. From this, you will make your own artistic piece, then we will do a gallery walk.	
Time: Groupings: (If necessary) Supplies	Lesson: • At Beacon Bluff, have students observe, participate, and fill out worksheet with the art piece. Take photos of the art piece for later. • Back in the classroom, brainstorm creative questions that students may have had about the demo area (guide as necessary): "why… what are the reasons…what if…what is the purpose of…how would it be different if…what if we knew…what would change if…etc.". Write down 10-12 questions; keep on board for all students to use as reference • Go over various art pictures, including the photos of the demo area using the creative questions as a guide for discussion. • Students can then create their own artistic interpretation of characteristics of water, the water cycle, and how humans use it. Choose to use between using watercolors, tempera paint, or acrylics. • Afterwards, have students get into small groups with their paintings and discuss what they did and why (10 min). Let students have gallery walk around room to admire everyone's work	
Time: Groupings:	Closure (sharing what was learned): Discussion followed by Think/Pair/Share, KWL, or student-created self-assessment.	
Notes/Reminders/Homework Assigned:		
Lesson Reflections (successes, challenges, changes, next steps):		

Diagnostic Assessment	Formative Assessment	Summative Assessment
✓ Observation ☐ Anecdotal Notes ✓ Interview ☐ Surveys ☐ Test/Quiz ☐ Questionnaires ☐ KWL (know, want to know, learned)	✓ Observation ☐ Anecdotal Notes ☐ Work Samples ☐ Test/Quiz ☐ Checklist ☐ Conference ☐ Peer Assessment ☐ Self Assessment	☐ Rubric ☐ Unit Test ✓ Self Assessment ☐ Peer Assessment ☐ Learning Log/Journal ☐ Projects ✓ Presentation ☐ Reports (oral/written)

Purpose:	Collaborative/Social Skills:
✓ Mental Set ✓ Sharing Purpose/Objectives ✓ Input ☐ Modeling ✓ Checking for Understanding ☐ Guided Practice ✓ Independent Practice ☐ Closure	✓ Participate Fully ✓ Listening Attentively ✓ Expressing Appreciation ✓ Reflecting on Experience ✓ Valuing Diversity ✓ Thinking Constructively ✓ Making Responsible Decisions ☐ Resolving Conflict ✓ Solving Problems Creatively ☐ Working on Tasks Together ✓ Celebrating Achievement

Accommodations/Modifications	Blooms Taxonomy:	Multiple Intelligences:
✓ Increase time, space, amount ✓ Decrease ☐ Change ☐ Scribe ☐ Oral Explanations ☐ Peer tutor/Partner ✓ Use manipulative	✓ Knowledge ✓ Understanding ✓ Application ✓ Analysis ✓ Synthesis ✓ Evaluation	✓ Linguistic ✓ Spatial ✓ Interpersonal ✓ Logical/Mathematical ☐ Bodily/Kinesthetic ☐ Musical ✓ Naturalistic ✓ Intrapersonal



Lesson

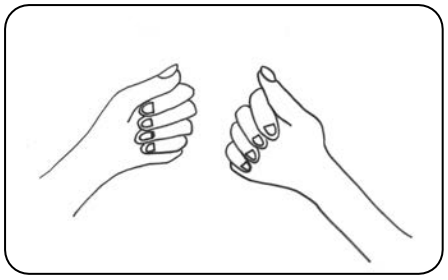
The Art of Motion

Curriculum Areas/Strand/Grade Level:

Science: 5.2.2.1.1, 5.2.2.1.2, 5.2.2.1.3/5th Grade
Art: 4.1.1.5.1, 4.1.1.5.2, 4.1.2.5.1, 4.2.1.5.1, 4.2.1.5.2/5th Grade

Project

In this lesson, students must already have basic knowledge of the mechanics of simple machines. This will help strengthen their knowledge of simple machines and how they work through creating machines through body movement and drawing a machine of their own. They will also go to Beacon Bluff and observe the storm water demo as a simple machine. The students will have a chance to receive critiques for their drawings from classmates, and then make a final good copy before having a gallery walk.



Learning Expectations

-I can create original two or three-dimensional artworks to express specific artistic ideas.
-I can revise artworks based on the feedback of others and self-reflection
-I can describe the tools, materials, and techniques used in a variety of two and three-dimensional medias.
-I can describe the characteristics of the elements of visual art
-I can describe how the principles of visual art
-I can give examples of simple machines and demonstrate how they change the input and output of forces and motion
-I can identify the forces that starts something moving or changes its speed or direction of motion
-I can demonstrate that a greater force on an object can produce a greater change in motion

Supplies

- Scissors
- Garden shovel
- Photocopies of a pair of hands in various positions holding invisible machines (several copies per student)
- Pencils
- Charcoal pencils
- Erasers

Time: (Min)	**Introduction/Prior Knowledge:** Mental Set ("the hook"): Walk to Beacon Bluff, observe the storm water demo and think about how it is an example of a simple machine. Ask students to look around and find other simple machines. Back in the classroom, brainstorm different types of simple machines. Ask if anyone thought of a pair of scissors as a simple machine. Have two students come up and, working together, become the scissors. Have them think about the fixed part of the lever and what part has to be together. Then have them become the scissors.
Time:	**Sharing the Purpose/Objectives (What's in it for the? Why should they participate?):** Show the students the garden shovel. Demonstrate how it is used and have two students demonstrate how it works by becoming the shovel and dirt. Put students into pairs, ask: "which machine can we use our bodies to move like?" Think of one together to pick.
Time: Groupings: (If necessary) Supplies	**Lesson:** - Have the partners go off and pick their machine then practice. Then, come together as a class again and have each pair come up and demonstrate their machine. The class has to guess what the machine is. Discuss the different types of machines the students saw. - Let students pick which photocopy of hands they want to use. Ask them to sketch their own simple machine design being used by the hands. Have them first sketch their picture in pencil. Walk around and provide feedback, suggestions, and comments. - After most students are done with the sketch, discuss artistic perspective: what do you really see? Do you see the sides of the machine? The top? Ask students to now draw the machine with the correct perspective into the hands on a new photocopy of the hands (same one as picked before). Have students use charcoal pencils to do the drawing. - Bring back rough copy and the new copy to show improvements, ask students for comments and compliments for each other's work. - Students will work on their final good copy. After listening to comments and compliments from classmates, make adjustments to make the machines as realistic as possible. - After students are done, have them do a gallery walk
Time: Groupings:	**Closure (sharing what was learned):** Come back as a class and discuss what was learned, by creating simple machines with their bodies and by creating their own simple machines. Also ask them what was learned about artistic perspective. If students have journals, ask that they write a journal entry.
Notes/Reminders/Homework Assigned:	
Lesson Reflections (successes, challenges, changes, next steps):	

Diagnostic Assessment

- ✓ Observation
- ✓ Anecdotal Notes
- ✓ Interview
- ☐ Surveys
- ☐ Test/Quiz
- ☐ Questionnaires
- ☐ KWL (know, want to know, learned)

Formative Assessment

- ✓ Observation
- ✓ Anecdotal Notes
- ✓ Work Samples
- ☐ Test/Quiz
- ☐ Checklist
- ☐ Conference
- ✓ Peer Assessment
- ✓ Self Assessment

Summative Assessment

- ☐ Rubric
- ☐ Unit Test
- ✓ Self Assessment
- ✓ Peer Assessment
- ✓ Learning Log/Journal
- ✓ Projects
- ✓ Presentation
- ☐ Reports (oral/written)

Purpose:

- ✓ Mental Set
- ✓ Sharing Purpose/Objectives
- ✓ Input
- ✓ Modeling
- ✓ Checking for Understanding
- ✓ Guided Practice
- ☐ Independent Practice
- ☐ Closure

Collaborative/Social Skills:

- ✓ Participate Fully
- ✓ Listening Attentively
- ✓ Expressing Appreciation
- ✓ Reflecting on Experience
- ✓ Valuing Diversity
- ✓ Thinking Constructively
- ✓ Making Responsible Decisions
- ✓ Resolving Conflict
- ✓ Solving Problems Creatively
- ✓ Working on Tasks Together
- ✓ Celebrating Achievement

Accommodations/Modifications

- ✓ Increase time, space, amount
- ✓ Decrease
- ✓ Change
- ✓ Scribe
- ✓ Oral Explanations
- ✓ Peer tutor/Partner
- ✓ Use manipulative

Blooms Taxonomy:

- ✓ Knowledge
- ✓ Understanding
- ✓ Application
- ✓ Analysis
- ✓ Synthesis
- ☐ Evaluation

Multiple Intelligences:

- ✓ Linguistic
- ✓ Spatial
- ✓ Interpersonal
- ✓ Logical/Mathematical
- ✓ Bodily/Kinesthetic
- ☐ Musical
- ☐ Naturalistic
- ✓ Intrapersonal

Beacon Bluff

Rain Garden

Lesson

Nature and Art

Curriculum Areas/Strand/Grade Level:

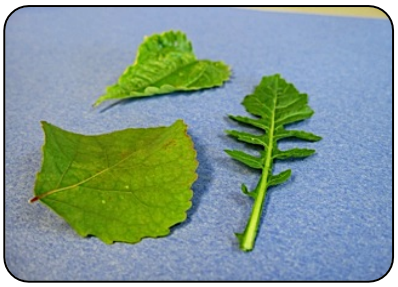
Science/5.4.1.1.1, 5.4.2.1.1,5.4.2.1.2/5th
Art/4.2.1.5.1, 4.1.3.5.2/5th

Project

(Or, Background and Introduction)

Students have learned how living things are diverse with many different characteristics, with nature systems having many components that interact.

Students will explore the use of nature in art, understand how nature systems in Minnesota are delicate, and how species cannot survive without each other



Learning Expectations

-I can describe how visual art communicates meaning
-I can create 2 or 3-dimensional artworks
-I can describe how plant structures and their functions provide an advantage for survival and describe natural systems in Minnesota, and explain what would happen to a system if one if its parts were changed

Supplies

Projector
Paintings by Thomas Locker and Vincent van Gogh
Clip boards
Paper, pencils (various for drawing), charcoal, chalk pastels
Sky Tree by Thomas Locker

Time: (Min)	**Introduction/Prior Knowledge:** Mental Set ("the hook"): Introduce plants and nature in art by reading Thomas Locker's *Sky Tree*. What is the same about each painting? What is different? How does Locker use color? How scientifically accurate are the paintings? Is that important?
Time:	**Sharing the Purpose/Objectives (What's in it for the? Why should they participate?):** Students will explore the use of nature in the arts, understand how nature systems in Minnesota are delicate, and how species cannot survive without each other
Time: Groupings: (If necessary) Supplies	**Lesson:** • In small groups, give students pictures of Van Gogh and Thomas Locker's work depicting nature. Have the groups pick one of the tree paintings to evaluate and share with the class. • Discuss the role of leaves – photosynthesis and capturing rain water • Go to Beacon Bluff and observe the Storm Water Demo and Rain Garden, let students observe the demo area, and how the art work depicts the delicate balance of nature. Ask each student to collect 5 different leaves to bring to class (do not pick from plants!). The teacher should also pick leaves in case students overlook them (pine needles). • Develop a leaf classification system based on like characteristics (work independently or small group) no right or wrong answer. • Show students a science-based leaf classification system online via projector • Create leaf-based artwork using the work of Locker and Van Gogh through rubbings. • Let students go on a gallery walk and examine each other's work
Time: Groupings:	**Closure (sharing what was learned):** Discuss as a class, Think/Pair/Share, or have students complete a student-made self-assessment.
Notes/Reminders/Homework Assigned:	
Lesson Reflections (successes, challenges, changes, next steps):	

Diagnostic Assessment	Formative Assessment	Summative Assessment
✓ Observation ✓ Anecdotal Notes ✓ Interview ☐ Surveys ☐ Test/Quiz ☐ Questionnaires ✓ KWL (know, want to know, learned)	✓ Observation ✓ Anecdotal Notes ✓ Work Samples ☐ Test/Quiz ☐ Checklist ☐ Conference ✓ Peer Assessment ☐ Self Assessment	☐ Rubric ☐ Unit Test ☐ Self Assessment ☐ Peer Assessment ☐ Learning Log/Journal ☐ Projects ✓ Presentation ☐ Reports (oral/written)

Purpose:

- ✓ Mental Set
- ✓ Sharing Purpose/Objectives
- ✓ Input
- ✓ Modeling
- ✓ Checking for Understanding
- ✓ Guided Practice
- ☐ Independent Practice
- ☐ Closure

Collaborative/Social Skills:

- ✓ Participate Fully
- ✓ Listening Attentively
- ✓ Expressing Appreciation
- ✓ Reflecting on Experience
- ✓ Valuing Diversity
- ✓ Thinking Constructively
- ✓ Making Responsible Decisions
- ✓ Resolving Conflict
- ✓ Solving Problems Creatively
- ✓ Working on Tasks Together
- ✓ Celebrating Achievement

Accommodations/Modifications

- ✓ Increase time, space, amount
- ☐ Decrease
- ✓ Change
- ✓ Scribe
- ✓ Oral Explanations
- ✓ Peer tutor/Partner
- ✓ Use manipulative

Blooms Taxonomy:

- ✓ Knowledge
- ✓ Understanding
- ✓ Application
- ☐ Analysis
- ✓ Synthesis
- ☐ Evaluation

Multiple Intelligences:

- ✓ Linguistic
- ☐ Spatial
- ✓ Interpersonal
- ☐ Logical/Mathematical
- ☐ Bodily/Kinesthetic
- ☐ Musical
- ✓ Naturalistic
- ✓ Intrapersonal

Beacon Bluff

Rain Garden

Lesson

Native American Culture, Tradition, and Science

Curriculum Areas/Strand/Grade Level:

Science/5.1.3.2.1, 5.3.4.1.1, 5.3.4.1.3/5th
Art/4.1.3.5.1, 4.1.3.5.2, 4.2.1.5.1/5th

Project

(Or, Background and Introduction)

Students will have/have learned about the process of experiments and scientific inquiry. Students will be/have been studying the delicate balance of the environment.

In this activity, students will focus on how Native American traditions, even those here in Minnesota, have incorporated nature into both daily life and art.

Learning Expectations

-I can describe how science and engineering influence and are influenced by local traditions and beliefs
-I can identify renewable and non-renewable energy and material resources that are found in Minnesota
-I can compare the impact of individual decisions on natural systems
-I can create original 2 or 3-dimensional art
-I can describe how visual art conveys meaning
-I can describe the personal, social, cultural, or historical contexts that influence the creation of art including the contributions of American Indian tribes and communities

Supplies

-images of American Indian art and artifacts
-projector
-clay
-sculpting tools
-kiln (if no kiln, use airdry clay, but test to see how well it dries first. Some crumble when dried and will not stay together).

Time: (Min)	Introduction/Prior Knowledge: Mental Set ("the hook"):	Show an image of Native American art or artifact – ask students to discuss how it is both an important survival tool and work of art.
Time:	Sharing the Purpose/Objectives (What's in it for the? Why should they participate?): The artifacts and art give a glimpse of how Native American artists expressed themselves and their beliefs through natural materials.	
Time: Groupings: (If necessary) Supplies	Lesson: • Generate creative questions with the class, then let them go into small groups to brainstorm and discuss the pictures on the projector of art and artifacts. Discuss briefly as a class what each group talked about. • Walk to park, go to the Beacon Bluff and look at the art pieces – ask: how is the artist's work similar to the art of the American Indian people? How is it different? What does the artwork make you want to explore? Is the rain garden itself a work of art? Why or why not? How is the rain garden similar technology to the artifacts used by the American Indians? • Come back to class, let students brainstorm about their sculpture – can be an artistic piece, or practical artifact. Review with students various sculpting techniques and creating three-dimensional works of art. Have sculpting tools available if students wish to carve details into their clay pieces. Remind students to carve initials into bottom of clay piece when done. When pieces are all dry, bake in a kiln (if no access to kiln, use air dry clay).	
Time: Groupings:	Closure (sharing what was learned): Ask students to partner and think/pair/share what they learned today. Discuss as a class.	
Notes/Reminders/Homework Assigned:		
Lesson Reflections (successes, challenges, changes, next steps):		

Diagnostic Assessment	Formative Assessment	Summative Assessment
✓ Observation ✓ Anecdotal Notes ☐ Interview ☐ Surveys ☐ Test/Quiz ☐ Questionnaires ✓ KWL (know, want to know, learned)	✓ Observation ✓ Anecdotal Notes ✓ Work Samples ☐ Test/Quiz ☐ Checklist ☐ Conference ☐ Peer Assessment ☐ Self Assessment	☐ Rubric ☐ Unit Test ☐ Self Assessment ☐ Peer Assessment ☐ Learning Log/Journal ☐ Projects ☐ Presentation ☐ Reports (oral/written)

Purpose:	Collaborative/Social Skills:
✓ Mental Set ✓ Sharing Purpose/Objectives ✓ Input ☐ Modeling ✓ Checking for Understanding ✓ Guided Practice ☐ Independent Practice ☐ Closure	✓ Participate Fully ✓ Listening Attentively ✓ Expressing Appreciation ✓ Reflecting on Experience ✓ Valuing Diversity ✓ Thinking Constructively ✓ Making Responsible Decisions ✓ Resolving Conflict ✓ Solving Problems Creatively ✓ Working on Tasks Together ✓ Celebrating Achievement

Accommodations/Modifications	Blooms Taxonomy:	Multiple Intelligences:
✓ Increase time, space, amount ☐ Decrease ✓ Change ✓ Scribe ✓ Oral Explanations ✓ Peer tutor/Partner ✓ Use manipulative	✓ Knowledge ✓ Understanding ☐ Application ✓ Analysis ☐ Synthesis ☐ Evaluation	✓ Linguistic ☐ Spatial ✓ Interpersonal ☐ Logical/Mathematical ☐ Bodily/Kinesthetic ☐ Musical ✓ Naturalistic ✓ Intrapersonal

Beacon Bluff

Rain Garden

Lesson

Native American Cultural Tie-In

Curriculum Areas/Strand/Grade Level:

Science/5.1.3.2.1, 5.4.2.1.1/5th grade
Art/4.1.3.5.2/5th grade

Project

(Or, Background and Introduction)

Students have learned that caring for the land is vital for future generations. Indigenous cultural tribes have used the land while also respecting it. Students will learn about Native American technology in ecosystems similar to our own through storytelling, photos, and a trip to the Beacon Bluff Rain Garden.

Learning Expectations

- I can describe how science and engineering influences and are influenced by local traditions and beliefs
- I know how sustainable agricultural practices were used by many cultures throughout history
- I will understand how art communicates different meaning

Supplies

- Clip boards
- Pencils
- Projector
- Examples of American Indian technology
- *The Legend of the Lady Slipper* by Margi Preus
- watercolor paper (one per student)
- paint pallet (or something that can hold paint) (one per student)
- small cups with water and ink (20% ink, 80% water) (one per student)
- paper towels
- nylon watercolor brush, smaller tip (one per student)
- black medium ballpoint pen (one per

Time: (Min)	Introduction/Prior Knowledge: Mental Set ("the hook"):	Show different examples of how we use water today, start a discussion with students on how they use water in their daily lives
Time:	**Sharing the Purpose/Objectives (What's in it for the? Why should they participate?):** Students will learn how American Indian cultures, as well as other indigenous cultures, have respected nature while also using it for thousands of years, and how we can learn from their example.	
Time: Groupings: (If necessary) Supplies - Clip boards - pencils - scavenger hunt sheet	**Lesson:** • Read the book *The Legend of the Lady Slipper*; afterwards, ask students if they noticed how Native Americans in the story used technology without hurting nature. Show photo examples of various American Indian and other indigenous artifacts that are good examples of technology without hurting the environment • Go on a field trip to the Rain Garden. Let students interact with the demo and the rain garden. Ask students if they can make any connections between the rain garden and American Indian technology. • Create a local plant and wildlife scavenger hunt worksheets. Have students try to find each specific item on the sheet and check them off one by one. • Back in the classroom, ask students to brainstorm about a particular item they use every day. Ask to think about how that item has evolved over time. Have students draw the item as it is now, then think of how that item must have looked before the current version. Have them sketch their ideas down. Then ask them to think even further back two more prior stages. The student should have the item drawn four times: the current version, the one before, the one before that, and how they think the original might have looked. • Demonstrate to students the artistic technique of pen and wash. For instruction tips, go to http://www.youtube.com/watch?v=KfvmDfiQ3ak Have students first use a pencil to lightly draw the outline of their shapes, then go over the outlines and make texture with the pen, and then finally adding the wash to give definition and contrast.	
Time: Groupings:	**Closure (sharing what was learned):** In the classroom, discuss together what plants were found during the Beacon Bluff Rain Garden scavenger hunt. Discuss which plants were most common/least common. Ask students in small groups to discuss why they think Native American culture made folktales about certain plants they had in their environments.	
Notes/Reminders/Homework Assigned:		
Observations		

Diagnostic Assessment	Formative Assessment	Summative Assessment
✓ Observation ✓ Anecdotal Notes ☐ Interview ☐ Surveys ☐ Test/Quiz ☐ Questionnaires ☐ KWL (know, want to know, learned)	✓ Observation ☐ Anecdotal Notes ☐ Work Samples ☐ Test/Quiz ✓ Checklist ☐ Conference ☐ Peer Assessment ☐ Self Assessment	☐ Rubric ☐ Unit Test ☐ Self Assessment ☐ Peer Assessment ☐ Learning Log/Journal ☐ Projects ☐ Presentation ☐ Reports (oral/written)

Purpose:

- ✓ lMental Set
- ✓ lSharing Purpose/Objectives
- ✓ lInput
- ☐ Modeling
- ✓ lChecking for Understanding
- ✓ lGuided Practice
- ✓ lIndependent Practice
- ✓ lClosure

Collaborative/Social Skills:

- ✓ Participate Fully
- ✓ Listening Attentively
- ✓ Expressing Appreciation
- ✓ Reflecting on Experience
- ✓ Valuing Diversity
- ✓ Thinking Constructively
- ☐ Making Responsible Decisions
- ✓ Resolving Conflict
- ✓ Solving Problems Creatively
- ✓ Working on Tasks Together
- ✓ Celebrating Achievement

Accommodations/Modifications	Blooms Taxonomy:	Multiple Intelligences:
✓ Increase time, space, amount ✓ Decrease ☐ Change ✓ Scribe ✓ Oral Explanations ✓ Peer tutor/Partner ☐ Use manipulative	✓ Knowledge ✓ Understanding ✓ Application ✓ Analysis ☐ Synthesis ☐ Evaluation	✓ Linguistic ✓ Spatial ✓ Interpersonal ✓ Logical/Mathematical ☐ Bodily/Kinesthetic ☐ Musical ✓ Naturalistic ☐ Intrapersonal

Works Cited

AHC Arts & Crafts. "DIORAMA CRAFTS FOR KIDS: Ideas for Arts & Crafts Activities for Making Dioramas for School Projects for Children & Teens." *Diorama Crafts Ideas & Projects for Kids: Ideas for Arts & Crafts Activities & Instructions for Making Dioramas for School Projects for Children & Teens*. AHC Arts & Crafts: Helping Kids with Art, n.d. Web. 19 July 2013. http://www.artistshelpingchildren.org/dioramasartscraftsideasprojectskids.html.

"Art of the Native Americans - The Thaw Collection at the Minneapolis Institute of Arts." *Art of the Native Americans - The Thaw Collection at the Minneapolis Institute of Arts*. Ed. Department of Teacher Resources. Department of Teacher Resources - Minneapolis Institute of Art, 24 Oct. 2011. Web. 01 July 2013. http://www.artsmia.org/thaw-collection/pdfs/All%20Regions.pdf .

Arieli-Chai, Hagit, and Daniella Garran. "The Kennedy Center ARTSEDGE: Exploring Weather Conditions Through Painting." *ARTSEDGE: Exploring Weather Conditions Through Painting*. The Kennedy Center, n.d. Web. 03 Sept. 2013. http://artsedge.kennedy-center.org/educators/lessons/grade-3-4/Exploring_Weather.aspx.

"Artful Thinking." *Artful Thinking*. Traverse Area Public Schools, Project Zero at Harvard Graduate School of Education, n.d. Web. 22 Apr. 2013. http://www.pzartfulthinking.org/cc_water_1.php.

Barry, Sharon L. "Earth's Water Cycle." *National Geographic Education*. Ed. Lydia Lewis and Julie Brown. National Geographic, n.d. Web. 26 Sept. 2013. http://education.nationalgeographic.com/education/activity/earths-water-cycle/?ar_a=1

BrainPOP. "BrainPOP Jr. | Changing States of Matter | Lesson Ideas." *BrainPOP Jr. | Changing States of Matter | Lesson Ideas*. BrainPOP, n.d. Web. 10 July 2013. http://www.brainpopjr.com/science/matter/changingstatesofmatter/grownups.weml.

Calder, Alexander. *Lobster Trap and Fish Tail*. 1939. Painted steel wire and sheet aluminum. Museum of Modern Art, New York.

Cope, Lisa M. "Create a Bean Mosaic!" *Education.com*. Education.com, 12 Oct. 2012. Web. 01 July 2013. http://www.education.com/activity/article/Create_Lasting_Mosaic/

Farkas, Andreja, Malini Persaud, and Michael Costelloe. "The Local Community: Grade 1 Social Studies Unit." *Curriculum Planner Units Grades 1-8*. The Ministry of Education, Curriculum and Assessment Branch, Sept. 2001. Web. 5 June 2013. http://orgs.educ.queensu.ca/curr/LocalComm.pdf

Green Education Foundation Staff. "How to Grow Beans in a Plastic Bag." *How to Grow Beans in a Plastic Bag*. Green Education Foundation, 2011. Web. 19 July 2013. http://www.greeneducationfoundation.org/institute/lesson-clearinghouse/294-How-to-Grow-Beans-in-a-Plastic-Bag.html.

Harris, Peter, and Deborah Allwright. *The Night Pirates*. London: Egmont, 2005. Print.

Hartman, Gail, and Harvey Stevenson. *As the Crow Flies: A First Book of Maps*. Minneapolis, MN: Sagebrush, 1999. Print.

"How to Make Paper Look Old." *WikiHow*. N.p., n.d. Web. 01 July 2013.

Heidinger, Michelle, and Carol P. Smalley. "The Kennedy Center: ARTSEDGE - the National Arts and Education Network." *ARTSEDGE: Making Rain*. The Kennedy Center, n.d. Web. 22 Apr. 2013. http://artsedge.kennedy-center.org/educators/lessons/grade-k-2/Making_A_Rainstick.aspx .

Heidinger, Michelle, and Carol P. Smalley. "The Kennedy Center: ARTSEDGE - the National Arts and Education Network." *ARTSEDGE: Trees in Nature and Art*. The Kennedy Center, n.d. Web. 22 Apr. 2013. http://artsedge.kennedy-center.org/educators/lessons/grade-5/Tress_In_Nature_And_Art.aspx.

Hokusai. *The Great Wave off Kanagawa*. 1830. Color woodcut. The Metropolitan Museum of Art, New York.

Intersecting Ojibwe Art. "Ojibwe Storytelling: A Mural Project."*: Intersecting Ojibwe Art Curriculum*. University of Minnesota, n.d. Web. 10 Sept. 2013. http://intersectingart.umn.edu/?lesson/43

Hui, Wang. *Summer Mountains, Misty Rain*. 1668. Handscroll, ink and color on paper. Asian Art Museum of San Francisco, California.

LaForge, Holly. "APRIL SHOWERS RAINDROP PAINTING." *April Showers Raindrop Painting Lesson Plan: Painting for Kids*. Www.kinderart.com, n.d. Web. 03 Sept. 2013. http://www.kinderart.com/painting/showers.shtml

Leslie, and Julia. "It's Time to Spill the Beans." Web log post. *Two Busy Brunettes*. Wordpress, 8 Mar. 2012. Web. 12 July 2013. http://www.2busybrunettes.com/its-time-to-spill-the-beans/.

Liangyang, Yong. *Let the Hills Be Hills and the Rivers Be Rivers, Leave Nature Alone, Don't Let Nature Come to an End*. 2009. Advertisement, commercial. JWT Shanghai, CEPF, Shanghai.

Lu, Zhaofan. "Step-by-Step Chinese Painting Demonstration." *About.com Painting*. About.com, 2007. Web. 26 Sept. 2013. http://painting.about.com/od/stepbysteppaintingdemos/ss/Zhaofan_Liu.htm

Luce, Don, and Gayle Crampton. "Bell Museum's Creator of Wildlife Dioramas." *Minnesota Department of Natural Resources* Jan. 1987: 36-43. *Minnesota Department of Natural Resources*. Minnesota Department of Natural Resources. Web. 12 July 2013. http://webapps8.dnr.state.mn.us/mcv_pdf/articles/218_Bell_Museums_Creator_of_Wildlife_Dioramas.pdf.

Lunge-Larsen, Lise, Margi Preus, and Andrea Arroyo. *The Legend of the Lady Slipper: An Ojibwe Tale*. Boston: Houghton Mifflin, 1999. Print.

Marsh, Reginald. *The Locomotive*. 1935. Tempera on concrete. Huntington Library, Art Collections and Botanical Gardens, California.

"Minnesota Academic Standards; Science K-12 2009 Version." *Minnesota Department of Education*. Minnesota Department of Education, 24 May 2010. Web. 3 June 2013. http://education.state.mn.us/mdeprod/idcplg?IdcService=GET_FILE&dDocName=005263&RevisionSelectionMethod=latestReleased&Rendition=primary .

"Minnesota Academic Standards: English Language Arts K-12 2010." *Minnesota Department of Education*. Minnesota Department of Education, 27 Sept. 2010. Web. 3 June 2013. http://education.state.mn.us/mdeprod/idcplg?IdcService=GET_FILE&dDocName=005238&RevisionSelectionMethod=latestReleased&Rendition=primary .

"Minnesota Academic Standards: Arts K-12 2008." *Minnesota Department of Education*. Minnesota Department of Education, 4 Mar. 2009. Web. 3 June 2013. http://education.state.mn.us/mdeprod/idcplg?IdcService=GET_FILE&dDocName=005241&RevisionSelectionMethod=latestReleased&Rendition=primary

"Minnesota K-12 Academic Standards: Social Studies 2011." *Minnesota Department of Education*. Minnesota Department of Education, 17 Feb. 2012. Web. 3 June 2013. http://education.state.mn.us/mdeprod/idcplg?IdcService=GET_FILE&dDocName=042018&RevisionSelectionMethod=latestReleased&Rendition=primary

Moore, Jackson, Johnston, Lynch, Tonner, and Tudhope. "Energy from Wind and Moving Water." *Curriculum Planner Units Grades 1-8*. Queens University, Sept. 2001. Web. 5 Sept. 2013. http://orgs.educ.queensu.ca/curr/EnerWind.pdf

Native Storytelling: Thirza Defoe. Dir. Smithsonian. Perf. Thirza Defoe. *National Museum of the American Indian*. Smithsonian, 15 Mar. 2012. Web. 10 Sept. 2013. http://www.youtube.com/watch?v=M7RULN6cRk8

The Ojibway Creation Story. Dir. Ningwakwe Learning Press. Perf. Ningwakwe Learning Press. *YouTube*. YouTube, 05 May 2011. Web. 10 Sept. 2013. http://www.youtube.com/watch?v=Etn92Ms8plo

Purty Bird, Linda. "Etsy {NewYork} Street Team - Indie Artists, Artisans & Crafters of the NY Metro Region: Homemade Polymer Clay." *Etsy {NewYork} Street Team - Indie Artists, Artisans & Crafters of the NY Metro Region: Homemade Polymer Clay*. Etsy, 28 June 2011. Web. 15 July 2013. http://thenewnew.blogspot.com/2011/06/homemade-polymer-clay.html.

Reddish, Laura, and Oren Lewis. "Native Languages of the Americas: Manabozho Stories and Other Anishinabe Stories." *Native Languages of the Americas*. Native Languages of the Americas, 1998. Web. 10 Sept. 2013. http://www.native-languages.org/anishinabe-legends.htm .

Relf, Patricia, and Joanna Cole. *The Magic School Bus: Wet All Over: A Book About the Water Cycle*. New York: Scholastic, 1996. Print.

S, Rachel. "Mountain Landscape Collages." Web log post. *Color, Collage, and Much More*. Blogspot.com, 2 Dec. 2010. Web. 01 July 2013. http://colorandcollage.blogspot.com/2010/12/mountain-landscape-collages.html

Shelburne Farms. "Pollution Solutions." *United States Environmental Protection Agency*. United States Environmental Protection Agency, 1995. Web. 05 Sept. 2013. http://www.epa.gov/superfund/students/clas_act/spring/polsol.htm

Simple Machines: Science & Art Integration. Dir. DeLuca. Perf. Mr. DeLuca. *Teaching Channel*. The Teaching Channel, Feb. 2013. Web. 26 Sept. 2013. https://www.teachingchannel.org/videos/teaching-simple-machines

Skruben. "How To: Self-Watering Seed Starter Pots." Web log post. *Skruben: An Eclectic Collection of Intriguing Topics and Odd Obsessions*. Blogspot.com, 24 Mar. 2012. Web. 01 July 2013. http://skruben.blogspot.com/2012/03/how-to-self-watering-seed-starter-pots.html

Spier, Peter. *Peter Spier's Rain.* Garden City, NY: Doubleday, 1982. Print.

University of Minnesota - Duluth. "Tweed Museum of Art 50 Stories in Art - Activity 9."*Http://www.d.umn.edu/tma/collections/activity_pdfs/stories_activity%209.pdf*. Tweed Museum of Art, University of Minnesota - Duluth, n.d. Web. 10 Sept. 2013. http://www.d.umn.edu/tma/collections/stories/cat09.html

UpToTen. "The Colorful Waterwheel - Craft Activity." *The Colorful Waterwheel*. UpToTen, n.d. Web. 05 Sept. 2013. http://www.uptoten.com/kids/coloringpage-mixedbag-craft-colorfulwatermillcraft.html.

Wintemberg, Rachel. "The Art of the Brush." *The Helpful Art Teacher*. Blogspot.com, 13 Feb. 2011. Web. 26 Sept. 2013. http://thehelpfulartteacher.blogspot.com/2011/02/art-of-brush.html

YouTube. Dir. Henry Li and Blue Heron Arts Co. Perf. Henry Li. *Landscape Painting Tutorial: Grand Canyon with Split Brush Techniques on Triple Xuan Paper*. YouTube, 18 Jan. 2011. Web. 26 Sept. 2013. http://www.youtube.com/watch?v=Ov6iI_7hhBY.

Zhengming, Wen. *Eight Songs of the Xiao and Xiang Rivers (瀟湘八詠)*. 1550. Ink on paper. The Metropolitan Museum of Art, New York.