

Project Title: * Willoughby Science Pond

To be eligible for the grant, projects should be specifically tied to one or more of the following topics (Choose all that apply) *

Waste Reduction
Water Conservation
The Water Cycle
Native Plant and/or Pollinator-Friendly Gardens

Amount Requested: * 500

Teacher / Leader's Name: * Melissa Sivells

School or Organization Name & Complete Address: *
Willoughby Elementary School
9500 4th View Street
Norfolk, VA 23503

Subject / Grade / Age Range: * Science/ Pre-K-2nd/ 3 -8 years

Number of Children: * 197

Goals & Objectives: *

The goal of the project is to help students understand the concept of an ecological system, using the school pond and immediate surroundings as a site for regular investigation during the spring and fall semester.

They will use nets to catch and identify aquatic insects, fish and plants. All animals and plants will be returned to their habitat unharmed. The pond water will be measured to teach the students about evaporation.

each class will visit the pond twice a month. In addition, the teacher will gain experience in designing and conducting ecology lessons with their students, which will benefit the students understanding of living systems.

Supplemental Questions:

1. Willoughby Elementary School has used the pond since 2005.
- 2.(a) The school pond was built to help students learn plant life and water life.
(b) School bulletin board will post students data and other information collected.
3. Melissa Sivells and school staff will supervise the program.

4. The School administrator and the custodial staff support the program. The Virginia Standards of Learning Curriculum must be used. This policy is in place.
5. Each classroom will be responsible for collecting data and digital photos. Data will be posted on the bulletin board monthly.

SOL k.1, 1.1, 2.1 Conduct & record observations, collect and analyze data, draw conclusion

K.7 Investigate & understand needs and life processes of plants and animals.

1.4 Investigate & understand plants have needs, identify basic parts and classify based on characteristics.

2.4 Plants and animals undergo series of changes as they nature and grow.

2.5 Living things are part of the system. Habitats provide what they need but can change over time.

Pre-K

VSFB 5a, Life Processes-Describe what living things need to live and grow.

VSFB 5b, Identify basic structures for plants and animals (plants-roots, stems, leaves: animals-eyes, mouth, ears, etc.).

Project Timeline: * Start Date: April 4, 2016
End Date: October 31,2016

Project Budget: * Pond pump & Tubing \$322.96
Pond Fish \$29.97
Water Plants \$25.96
Plants & Seeds \$3.96
Dirt & Mulch \$24.40
Starter Plant pots \$41.72
Total \$448.97

Name: * Melissa Sivells

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Phone Number: * (757) 531-3127

All information in this application is correct. I have reviewed the proposal with my school principal or organizational leader. As a condition of accepting the mini-grant money, I understand that I will be required to complete and submit the project summary form and pictures from the project upon completion of this project. I will submit my summary report within 14

By checking the box and submitting this form, I certify the above.

days of completion. *

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- 1. Please provide specific lessons or activities your students will participate in for each of the topics you selected on your application: Waste Reduction, Water Conservation, Water Cycle, Native plants/gardening.**

Student will plant Flowers and Vegetables. Students will observe the growth and needed on the plants. Students will take pictures and write about the changes. What happens to the soil with plant life on it? What happens to the soil without plant life on it? Students will investigate what happens to the pond water during different seasons.

- 2. Is the primary purpose of the pond drainage/stormwater? Why is a pump/tubing needed and how will it enhance the lessons/activities listed above? (Pictures of the pond may be helpful to give the committee members a better idea)**

The pond water comes from Rain water. No drainage other than overflow into the garden to help with plant and tree life. We have two butterfly trees. Student will observe the life cycle of the butterflies. Students will measure the storm water. The pump has a rock water fall. The pump is no longer working. The tubing is old and has holes. This affects the function of the water fall. During the winter months the water on the rock freezes. The teachers show the students "How the fish survive during the winter months under the ice." During that time they learn about Solids, Gases and liquids. The pump will improve the project by teaching the students about water cycle, animals and plant life. Please see the attachment for more lessons and pictures of our pond. In order for the student to study the pond the pump must be working effectively and efficiently.

The teachers have several lessons. If you need all of them. Please let me know. All the teachers have great lessons for the pond and plant life (ex. What changes when the seasons change?, How does the weather affect animals?, Why are plants dormant during the winter?)

- 3. Please indicate how the gardening supplies will be used and what plants will be purchase. (The application does not make mention of any gardening activities – just the interaction with the pond).**

Students will have plants in the planters for each season to see changes. (Please see pictures) Beans, Sunflowers, other seeds to see what will grow in each season.

Science – Week 3

0/31 – Needs of Plants Unit (April 22, 2014 – Earth Day)

<p>Materials Needed</p> <ul style="list-style-type: none">✓ 9 reusable cups, 5 trays and tray labels, tape, 10+ bean seeds, soil, water, watering jug, window/atrium, paper bag, hole puncher, Ziploc bag, labels for plants,✓ 5 rulers, magnifying glasses, journals, pencils, crayons, green thumb✓ camera/printer (optional) <p><u>Text:</u></p> <ul style="list-style-type: none">✓ <i>To Be Like the Sun</i> by Swanson and Chodos-Irvine✓ <i>The Reason for a Flower</i> by Ruth Heller✓ <i>Mortimer’s First Garden</i> by Karma Wilson	<p>Vocabulary</p> <p>living, life, organisms, plants, flowers, characteristics, growth/grow, movement, response, environment, needs, food, nutrients, air, water, light, survive, thrive, predict, hypothesis, observation, conclusion, control, variable</p> 
<p>Essential Questions</p> <ul style="list-style-type: none">~ What are the basic needs of plants?~ What does _____ mean?~ What observations can be made about a plant and its response to its environment?~ How can we use observations to make an informed prediction?~ How can we analyze data collected over time to draw conclusions?	<p>Objective (Setting a Purpose)</p> <p>TSW investigate and understand that:</p> <ul style="list-style-type: none">✓ K.6 B Living organisms have certain characteristics that distinguish them from nonliving objects including: response to the environment and the need for food, air and water.✓ K.7 B Plants need nutrients, water, air, light, and a place to grow and survive. <p>Reinforce:</p> <p>K.1 TSW demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations.</p> <p>K.2 B TSW investigate and understand that humans have senses that allow them to seek, find, take in, and react or respond to information in order to learn about their surroundings.</p>
<p>Anticipatory Set (Hook)</p> <p><u>Day 1:</u> TTW create a reverse concept map of plants' needs: a pot, a bag of soil, water droplets, shinny sun, and a sky of air. TSW predict the topic.</p> <p><u>Day 2 - 5:</u> TTW display the plants each day and elicit observations from the students.</p>	
<p>Procedures: Input: 5 E's Model</p> <ol style="list-style-type: none">1. TTW <i>engage</i> students by displaying the plants each day and asking questions/ elicit predictions for subsequent days.2. TSW <i>explore</i> the changes in the set of plants each day (color, size, shape, measurement).3. TTW and TSW <i>explain</i> their observations by applying their previous knowledge, as it relate to the observable changes in each plant.4. TTW and TSW <i>elaborate</i> on their knowledge through interactive read alouds.5. TTW and TSW <i>evaluate</i> student learning through independent practice: making observations, applying essential knowledge to answer questions,	

completing performance assessments.

Modeling

Day 1: TTW identify the basic needs of plants: a place to grow, nutrients (soil), water, light, and air. TTW model planting a seed and labeling it.

Day 2-7: TTW model making observations.

Day 8: TTW model making a conclusion based on observations.

Guided Practice

Day 1: TSW randomly select a number between 1 and 5, then divide themselves into five cooperating groups to plant 2 plants with the teacher's assistance:

	Plant 1	Plant 2
<i>No Place to Grow Group</i>	<i>Plant seed according to its envelope's instructions. Monitor daily to make sure it has all it needs.</i>	<i>Sow seed in a moist mound of soil on tray.</i>
<i>No Nutrients Group</i>		<i>Place seed in cup without soil.</i>
<i>No Water Group</i>		<i>Do not water.</i>
<i>No Light Group</i>		<i>Place a paper bag over the plant. The bag should have holes in the bottom so air can pass through.</i>
<i>No Air Group</i>		<i>Place the plant in a Ziploc bag and seal.</i>

Day 2-8: TTW and TSW discuss their observations: visual differences in size, color, shape, etc. TTW read books listed above until plants sprout.

Check for Understanding

Daily: TTW observe students' oral responses to questions and participation in group discussions.

Independent Practice

Day 1: TSW write a hypothesis about what they think will happen to plant 1 and 2.

Day 2 - 7: TSW care for plants as specified above and record daily observations once the plants sprout by drawing and labeling plants in their investigation journal.

Day 8: TSW review their hypothesis, previous observations, and write a conclusion stating if their hypothesis was proven or disproven, including what observations guided their conclusion.

Closure

<p><u>Daily</u>: TSW share their independent work by groups. TTW summarize the lesson and/or ask essential questions.</p>	
<p>Evaluation/Assessment <u>Daily</u>: TSW be evaluated on oral responses to questions, performance tasks, and independent practice to see if the students have mastered the objectives stated above. TTW collect and analyze the entries in the journals as a final assessment, paying close attention to final observation and conclusion. The teacher may hold conferences for clarity, if time permits.</p>	
<p>Extended Learning Opportunities <u>Daily</u>: homework, related books on feature book shelf</p>	<p>Suggestions for Differentiation <u>Daily</u>: TTW ask various types and levels of questions. TSW work in cooperative learning groups each day.</p>

CLASSROOM ACTIVITY

Title: What Is Water?

Objectives: Students will learn about the composition of water.

Time: 5 minutes

Materials: None

Preparation: None

Procedure:

- Explain that now that they have learned about the structure and function of pond Habitats it is important to take a closer look at the water that pond inhabitants depend on for survival.
- Tell the students that the chemical equation for water is H_2O . Water is made up of

Two elements: hydrogen and oxygen. Hydrogen is symbolized with an “H”, oxygen is symbolized with an “O”. Water has more hydrogen than oxygen. In fact, there are twice as many hydrogen atoms as oxygen atoms in a water molecule (H_2O). A water molecule is the unit of all three atoms. Draw a picture of the molecule to show how it looks like a teddy bear – the face is the oxygen atom and the ears are the two hydrogen atoms.

Remind the students how temperature affects water causing it to be a liquid, solid or gas. Heat makes water molecules move about rapidly. As the molecules collide with one another, individual particles are thrust into the air as water vapor. Cool temperatures cause water molecules to move about more slowly, packing them together. Water molecules gather in clouds until they fall to the ground as precipitation. When water freezes, molecules bond together and form ice.

CLASSROOM ACTIVITY

Title: (N) ice Trick

Objective: Students will examine how animals can live in a frozen pond.

Time: 5 minutes

Materials: Clear plastic cups, water and ice cubes

Preparation: Fill plastic cups with water.

Procedure:

- Students work in small groups. Give each group an ice cube and a glass of water.

Ask the children what will happen when they place an ice cube in the glass of water.

Have them see that the ice cube stays near the top of the water. Ice floats because it is less dense than water. The water molecules expand and lock together to form ice crystals when they freeze. The empty space between the molecules makes ice less dense (or lighter) than water.

- Ask the children if they have ever gone fishing in the winter. Explain that only the top layer of the pond/lake is frozen allowing animals to swim under the protection of the ice. If ice were denser than water it would sink and the pond/lake would freeze from the bottom up. Pond life would not be able to survive cold winter months.



