

First Grade

Unit 2: Plants



Essential Questions	Enduring Understandings
<p>Science</p> <ul style="list-style-type: none">• Why can't animals all live in the same place?• How do animals adapt to their environment? What are characteristics of animal groups?• Why are plants and animals important to us? How do plants and animals depend on each other to survive?• Are there plants that don't need much water to survive? If so, what are they and why don't they need much water? <p>Math</p> <ul style="list-style-type: none">• How can we represent a set of objects using numerals?• What happens when we join two quantities or take one from another?• How can we find the total when we join two quantities?• How can we find what is left when we take one quantity from another?• How can we find the difference when we compare one quantity to another?• How can we represent problem situations?• What happens when we change the order of numbers when we add (or subtract)? Why?• How can we show that addition and subtraction are related through fact families?• How can we use different combinations of numbers and operations to represent the same quantity?• How can we represent a number in a variety of ways? <p>Social Studies</p> <ul style="list-style-type: none">• How did Sacagawea's knowledge of nature, people, and land help Lewis and Clark on their journey?	<p>Science</p> <ul style="list-style-type: none">• Plants and animals inhabit different environments and have features that help them survive in different kinds of places.• Plants need: air, water, light, and nutrients.• Animals need: air, water, food, and shelter.• Plants have different structures that aid in growth, survival, and reproduction.• Functions of a plant: roots-holding plants in place and absorbing water; seeds- making new plants; leaves-making food for plants; stems-keeps plants upright and transports materials up and down the plant.• Animal physical characteristics: body coverings-hair, fur, feathers, scales, and shells; body shape; movement-walking, crawling, flying, swimming. <p>Math</p> <ul style="list-style-type: none">• Students develop strategies for adding and subtracting whole numbers based on their prior work with small numbers.• Students use a variety of models, including discrete objects and length-based models (e.g., cubes connected to form lengths), to model add-to, take-from, put-together, take-apart, and compare situations. They will use these models to develop meaning for the operations of addition and subtraction, and to develop strategies to solve arithmetic problems with these operations.• Students understand connections between counting and addition/subtraction (e.g., adding two is the same as counting on two).• Students use properties of addition to add whole numbers and to create and use

- Why is it important to know the cardinal and intermediate directions on a map?
- How do we use cardinal & intermediate directions while we are reading a map?
- In what ways did a lack of resources help or hurt Lewis and Clark while exploring?

increasingly sophisticated strategies based on these properties (e.g., “making tens”) to solve addition and subtraction problems within 20.

- By comparing a variety of solution strategies, students will build an understanding of the relationship between addition and subtraction.

Social Studies

- Decisions that may be made to help you may hurt others.
- In the past, women did not have the same rights as men; thus their roles were very different from that of Sacagawea.
- It is helpful to know and understand nature to survive and live a healthy and fruitful life.
- It is important to be able to map using both cardinal and intermediate directions.
- Scarcity can impact all aspects of life.

Real World Connection/PBL:

Background Information:

Plants are a necessary resource for the survival of the human race. As the population of the world increases the need for more farm land also increases. As we (the human race) strive to provide food for the increasing number of people; we must find alternatives to grow food.

Students will:

- Learn the importance of environmental engineering
- Learn how poor choices impact others
- Learn the importance of the ecosystem

Enduring Understandings

- Plants and animals inhabit different environments and have features that help them survive in different kinds of places.
- Plants need: air, water, light, and nutrients.
- Plants have different structures that aid in growth, survival, and reproduction.
- Functions of a plant: roots-holding plants in place and absorbing water; seeds- making new plants; leaves-making food for plants; stems-keeps plants upright and transports materials up and down the plant.

Essential Questions

- How can people make different choices now to help the Earth?
- What other ways can people provide food for themselves and others, that do not require the use of soil?
- Why is the role of an environmental engineer important to the needs of people and our world?

STEM Careers

Horticultural Scientist, Crop Physiologist, Taxonomist, Chemist, Landscape Scientist, Pathologist, Environmental Scientist, Plant Breeder, Geneticist, Propagation scientist, Soil scientist, food science technician, plant Biochemist, and Florist

Vocabulary

PBL Vocabulary:

Science: air, water, light, nutrients, root, stem, leaf, flower, and food

Math:

attribute, circle, cone, cube, cylinder, fourths, fractions, halves, partition, quadrilateral, quarters, rectangular prism, sphere, triangle, whole

Science Standards

Expectations: Recognize that plants and animals have basic life needs and specific physical characteristics. Classify plants and animals using their specific physical characteristics. Explain how weather and seasonal changes affect plants and animals.

S1L1. Students will investigate the characteristics and basic needs of plants and animals.

a. Identify the basic needs of a plant.

1. Air
2. Water
3. Light
4. Nutrients

c. Identify the parts of a plant—root, stem, leaf, and flower.

Technology (websites and 21st Century Tools)

ELA1W1k. Begins to use variety of resources (picture dictionaries, the Internet, and books) and strategies to gather information to write about a topic.

IT Standards:

- Entering information into a teacher created template (e.g. concept map).
- Illustrating a simple concept (e.g., concept map, web, bubble, etc.).
- Identifying components of multi-media presentations (e.g., title, transitions, sound effects, animation, text and graphics).

Resources:

Plant parts: <http://www.ahisd.net/campuses/woodridge/student/first/websites/plantparts.htm>

Parts of a plant: <http://www.urbanext.uiuc.edu/gpe/case1/c1facts2a.html>

Online Book About a Garden <http://www.primarygames.com/storybooks/plant/start.htm>

Plant Parts and Their Uses. 100% Educational Videos (2000). Retrieved May 15, 2007, from unitedstreaming: <http://www.unitedstreaming.com/>

Lewis and Clark: <http://www.lcsc.edu/lewis.clark/experience/> Lewis and Clark Links:

http://adifferentplace.org/lewis_and_clark.htm

Timeline Tools

<http://www.ourstory.com/>

<http://www.flickr.com/photos/tags/flicktion/>

<http://storybird.com>

Engineering (Implementation of STEM)

S1CS1, S1CS2, S1CS3, S1CS4, S1CS5, S1CS6, S1CS7: Habits of Mind and Nature of Science will be incorporated into all science processes, experiments and learning

Water Bottle Tower Garden (STEM Academy)

Alternative Growing Medium

Mathematics

SMP s:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.

4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Measurement

MCC1.MD.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Represent and solve problems involving addition and subtraction

MGSE1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

MGSE1.OA.2 Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. Understand and apply properties of operations and the relationship between addition and subtraction.

MGSE1.OA.3 Apply properties of operations as strategies to add and subtract.2 Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$. (Associative property of addition.)

MGSE1.OA.4 Understand subtraction as an unknown-addend problem. For example, subtract $10 - 8$ by finding the number that makes 10 when added to 8. Add and subtract within 20. **MGSE1.OA.5** Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

MGSE1.OA.6 Add and subtract within 20. a. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$). b. Fluently add and subtract within 10. Work with addition and subtraction equations.

MGSE1.OA.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? $6 = 6$, $7 = 8 - 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$.

MGSE1.OA.8 Determine the unknown whole number in an addition or subtraction equation relating to three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 + ? = 11$, $5 = \square - 3$, $6 + 6 = \Delta$

Social Studies Integration

Unit 3:

SS1H1 The student will read about and describe the life of historical figures in American history.

- b. Meriwether Lewis and William Clark with Sacagawea (exploration)

Reading/Writing Integration

ELA/Reading:

ELA1R1c. Demonstrates an understanding that punctuation and capitalization are used in all written sentences.

ELA1R6. Reads and listens to a variety of texts for information and pleasure.

ELA1W1j. Begins to use common rules of spelling.

ELA1LSV1c. Respond appropriately to orally presented questions.

ELA1R5a. Reads and listens to a variety of texts and uses new words in oral and written language.

ELA1LSV1a. Follows three-part oral directions.

ELA1LSV1b. Recalls information presented orally.

ELA1LSV1f. Uses complete sentences when speaking.

ELA1LSV1d. Increases vocabulary to reflect a growing range of interests and knowledge.

ELA1W1k. Begins to use variety of resources (picture dictionaries, the Internet, and books) and strategies to gather information to write about a topic.

ELA1LSV1e. Communicates effectively when relating experiences and retelling stories read, heard, or viewed.

ELA1R6m. Recognizes and uses graphic features and graphic organizers to understand text.

ELA1SV1: The student uses oral and visual strategies to communicate.

ELA1W1a. Writes texts of length appropriate to address a topic and tell a story.(Narrative Writing)

ELA1LSV1d.-e. Increases vocabulary & Communicates effectively.

ELA2LSV1d. Listens to and views a variety of media.

Narrative and Informational Writing:

ELA1W1. The student begins to demonstrate competency in the writing process. The student

- a. Writes texts of a length appropriate to address a topic and tell a story.
- b. Describes an experience in writing.
- c. Rereads writing to self and others, revises to add details, and edits to make corrections.
- d. Prints with appropriate spacing between words and sentences.
- e. Writes in complete sentences with correct subject-verb agreement.
- f. Uses nouns (singular and plural) correctly. g. Begins to use personal pronouns (e.g., I, me, we, us) in place of nouns.
- h. Uses singular possessive pronouns.
- i. Begins to write different types of sentences (e.g., simple/compound and declarative/interrogative).
- j. Begins to use common rules of spelling.
- k. Begins to use a variety of resources (picture dictionaries, the Internet, books) and strategies to gather information to write about a topic.
- l. Uses appropriate end punctuation (period and question mark) and correct capitalization of initial words and common proper nouns (e.g., personal names, months).
- m. Uses commas in a series of items.



Alternative Growing Medium Challenge

Background

We have been learning about plants. In learning about plants, we have learned about the needs of plants to grow. In our research, we have learned that farm land is being depleted but the need for food is ever increasing.

Challenge

As the population of the world increases, how can we solve our need to feed ourselves and others. As an environmental engineer, your task is to create an alternative growing medium for that will grow plants effectively rather than utilizing soil.

Constraints

Students can only use the materials and time provided.

Materials

- rocks
- marbles
- legos
- fruit (apples and oranges)
- paper (balls of paper)
- construction paper
- clear cups (so the students can view the growth of the plant)
- seeds
- area for the plants to receive natural lights

Tools



Water Bottle Tower Garden Challenge

Background

As we continue to build and work on developing and expanding our aquaponics lab, we will need to develop and create additional pieces. Our goal in creating additional pieces of the lab is to ensure that students understand how to create and develop an aquaponics system themselves.

Challenge

As an environmental engineer your task is to develop a vertical extension to our existing aquaponics lab. We have learned in our lab the needs of the both the plants and animals to survive in this man-made ecosystem. Our vertical system should provide water and nutrients, a growing medium and stability for the plant, and successfully grow plants.

Constraints

Students can only use the materials and time provided.

Materials

- Water bottles
- Soil
- Rope

Tools

- scissors
- Chicken wire (teacher use only)
- Wood to create frame (teacher use only)
- Drill(teacher use only)
- Exacto knife (teacher use only)