

2012

Stone Oak Park Exploration: 5th Grade

Canyon Ridge Elementary School (San Antonio, Tex.)

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Stone Oak Park – 5th Grade

Title: Stone Oak Park Exploration		Subject/Course: Science	
Topic: Changes Over Time (erosion, weathering, deposition) and Plant Adaptations		Grade: 5th	
		Designer(s): Canyon Ridge Teachers	
Stage 1- Desired Results			
Established Goals: Students will gain exposure to hands-on learning through the utilization of the park.			
Understandings: *There are various physical properties in each side of the park including, soil types, rock types, and vegetation *The area of leaves directly affects a plants ability to survive in its ecosystem *Trees can have a chemical reaction to insects *Plants have adaptations that provide protection from predators *The loss of habitat is generally considered to be the most critical problem facing wildlife today. *Human development of land areas affects plants and animals negatively.		Essential Questions: *What is a physical property? *What physical properties do you know about already? *Why is it important to know about the physical properties of objects and substances? *How do weathering, erosion, and deposition work together to change the earth’s surface. *What is the relationship between a leaf’s area and its survival? *What types of characteristics to plants have that provide it protection? *How does human development negatively affect the natural habitat of plants and animals?	
Knowledge and Skills: (4) In Grade 5, investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations and that methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. They have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world. (B) Within the natural environment, students learn how changes occur on Earth's surface. (C) Within the living environment, students learn that structure and function of organisms can improve the survival of members of a species. (9) Organisms and environments. The student knows that there are relationships, systems, and cycles within environments. The student is expected to: (A) observe the <u>way organisms live and survive</u> in their ecosystem by interacting with the living and non-living elements; (C) predict the <i>effects</i> of changes in ecosystems		Materials needed: Science notebooks, pencil, backpack, tape, Munsell Soil Color Chart, sieves, cameras, rulers, green and blue construction paper, hula hoops or string, sheets or blankets; Plant Adaptations Task Card; Rock Sizing Chart	

caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways; and

Stage 2- Assessment Evidence

Performance Tasks:

*Students will create either a Venn Diagram, Photo Story, or PowerPoint comparing and contrasting the vegetation, rock types, and soil types of each side of the park.

Other Evidence:

Written observations and responses in science journals

Stage 3- Learning Plan

Activity #1:

- Have students respond to the following question in their science journal: What do you think this area looked like 10 years ago?

South Side of the Park:

Activity #2:

- Have students collect 3 soil samples from 3 different locations in the south side of the park for evaluation. Using provided clear tape students tape a small sample and label in journal.

Activity #3:

- (There needs to be a pre-provided area of mixed sizes of rocks) Students will use sieves to separate various sizes of rocks.) Trace rocks in science journal and use the rock chart to identify type of rock and record.

Activity #4:

- Have students use flip cameras to take pictures of different types of trees, bushes, and grass. Use a piece of paper labeled with “South” or “North” in the pictures to distinguish between pictures taken in each side of the park.

Now travel to the North Side of the Park:

- Repeat activities 2, 3, and 4 from the south side of the park.

Activity #5:

- Have the students respond in their notebook to the following question: What do you think the area will look like in 10 years?

Activity #6:

- Students need to find 3 different sizes of plant leaves and trace into science journals. Then students should make an impression of each leaf in clay. Using rulers, measure the approximate area of each leaf and record in journal. Discuss in groups, and record in journals, how leaf size affects the tree’s ability to survive in its ecosystem. (Smaller leaves allow trees to retain more water, which results in the tree’s ability to sustain life in its ecosystem)

Activity #7:

- Plant adaptations for protection – Students locate 3 examples of plants that have adaptations for survival. (Berries, thorns, etc.) have students draw examples and record how the adaptation protects the

plant in their science journal.

Activity #8:

- Review with students the elements necessary for a habitat (food, water, shelter, and space). Tell the students that in this activity they will be simulating wildlife in its habitat.
- Divide the group into 4 teams: herbivores, carnivores, vegetation (e.g., trees, shrubs, grass, etc.) and people who will be land developers. Plan for 3 times as many herbivores as carnivores, with a small number of developers in proportion to the other 2 groups. The numbers (amount) of vegetation may vary. For example, two developers, 3 carnivores, 9 herbivores, and 6 trees or bushes (vegetation).
- Establish a large area (the north side of the park would be best). The “land developers” are to stay on the sidelines at this time, simply observing the undeveloped land and its wildlife inhabitants-or to meet on their own nearby, as they make plans for development.
- Provide each “herbivore” with string or hula hoops to use as “shelter”, 3 pieces of green construction paper to represent food, 1 piece of blue construction paper to represent water, and some of the vegetation portrayed by students.
- Provide each “carnivore” with string or hula hoop to use as a “lair”, space equivalent to that used by 3 herbivores, 3 herbivores as potential food source, one piece of blue construction paper to represent water, and some of the vegetation portrayed by students.
- Ask the “herbivores” to arrange the food, water, and shelter – including the students who are “vegetation” – in a space to represent their habitat. Once the herbivores have arranged their habitat, ask the “carnivores” to move into the area to establish their lairs and water sources, keeping an eye on the herbivores as possible food sources.
- Once all the animals are established in their habitats, it is time for the developers to enter the picture. They may use the space equivalent to that used by 3 herbivores. The developers may use the sheets and blankets to build their development. They may remove trees (represented by students), shelter, food, and water.
- Once they have constructed their development, engage all students in a discussion of what happened. What action took place? With what consequences? Would or did any animals die? From what causes? Could the developers have done anything differently to change the consequences? Could they have developed several scattered small areas instead of one large area, or vice versa, with what effects? Would it have reduced negative consequences for wildlife if they put the development in a different area of the habitat?
- Have the students reflect on the activity in their science journals.

FUN FACTS:

- Structure of Cactus – Ask students, “Where are the leaves?” Explain that the cactus pads are actually the stem of the plant and that cactus produces small leaves only once a year. If you find the Cochanil (white cotton-like substance) on the cactus, explain that this is actually a bug and when squished, the ‘bug juice’ is a red substance that was used by Native Americans and is still used today in items such as drinks and lipsticks.
- Galls – Round ball like objects found on oak tree limbs. These are tree growths formed when the tree has a chemical reaction to either the laying of eggs or by the sting of a wasp. (Scientists are not sure exactly what causes this.) As the larva forms, the tree growth (Gall) forms around the larva. The larva lives off of the Gall and when it becomes an insect, drills a hole and makes its way out of the Gall. The Gall can be crushed and used as ink and was used in quills to sign important documents, such as The Declaration of Independence.
- Huiseche (We-sach) – The Huiseche has two thorns growing from the same spot, forming a V, for self-defense.



Stone Oak Park Plant Adaptation TASK Card



Activity #1:

- Locate 3 leaves of different sizes.
- Trace into science journal.
- Using 3 pieces of clay, make an impression of each.
- Using your ruler, measure the approximate length and width of each leaf and record results in science journal.
- Determine the approximate area for each leaf and record. ($L \times W = \text{Area}$)
- Discuss in groups and record the answer to the following questions: How does leaf size affect a tree's ability to survive in its ecosystem?

Activity #2:

- Locate 3 examples of plants that have adaptations for survival.
- Draw each example in your science journal and record how the adaptation protects the plant.

A. Grain size	
Pebbles 4–64 mm	
Granules 2–4 mm	
"Gravel" > 2mm	
Coarse sand 0.5–2 mm	
Medium sand 0.25–0.5 mm	
Fine sand 0.06–0.25 mm	
Silt 0.004–0.06 mm	
Clay < 0.004 mm	

B. Rounding		
Angular	Sub-rounded	Well-rounded

C. Sorting	
Poorly sorted	Well-sorted

D. Grains and matrix	
Grain	Matrix