Problem Based Learning Lesson Plan

Problem for Problem Based Learning: Ranger Billy Bob has been a park ranger at Stone Mountain for over thirty years. Ten years ago, local residents insisted on having all of the wolves removed from the park. The residents were concerned about a rabies epidemic and thought that the Red wolf population was one of the main carriers. The wolves were removed. Since that time, the residents have noticed a major increase in the White tailed deer population and the Cottontail rabbit population. Now the residents are upset because something is eating all of their gardens, small trees and underbrush. Your task is to figure out how what is eating the gardens and other vegetation. Why has this started happening and what can be done about it?

Standards:

S4L1 Students will describe the roles of organisms and the flow of energy within an ecosystem.

a. Identify the roles of producers, consumers, and decomposers in a community.
b. Demonstrate the flow of energy through a food web/food chain beginning with sunlight and including producers, consumers, and decomposers.
c. Predict how changes in the environment would affect a community (ecosystem) of organisms.
d. Predict effects on a population if some of the plants or animals in the community are scarce or if there are too many.

S4L2. Students will identify factors that affect the survival or extinction of organisms such as adaptation, variation of behaviors (hibernation), and external features (camouflage and protection).

a. Identify external features of organisms that allow them to survive or reproduce better than organisms that do not have these features (for example: camouflage, use of hibernation, protection, etc.).
b. Identify factors that may have led to the extinction of some organisms.

Vocabulary:

- Producer
- Decomposer
- Consumer
- Ecosystem
- Population
- Community
- Habitat
- Food Web
- Food Chain
- Predator
- Prey
- Herbivore
- Omnivore
- Carnivore
- Camouflage
- Adaptation
Hibernation
- Mimicry
- Ecosystem
- Population
- Community
- Habitat
- Adaptation
- Hibernation
- Extinction

Materials:
- Paper for food chain and food web creations
- Resources for problem based learning approach that students chose, which will vary
- Information text about White Tailed deer, the Red wolf, and the Cottontail rabbit
- Information about Stone Mountain’s geography and weather patterns

Description:
As a class, we will review the schema that already exists regarding food chain and food webs using the fist to five formative assessment. If further clarification is needed regarding one of these topics, the Study Jams for food chains and food webs will be viewed. Relating back to the problem, students will need research and draw the food chains of the White Tailed deer, the Red wolf, and the Cottontail rabbit. You will also need to draw a food web including the White tailed deer, the Red wolf, and the Cottontail rabbit. After reviewing the food web, students will need to make a hypothesis about why the vegetation is being eaten, and what has made things get unbalanced? What needs to happen to bring everything back into balance? After students have shown your hypothesis to Ranger Billy Bob and have gotten his approval, the word has to get out. Students will then have the option of how they are going to share what they have learned from this Problem Based Learning Experience. The options consist of:

- Writing a letter to the residents of the area discussing the situation. Students will be advising them of what is eating their gardens, and other vegetation. The letter will also need to let them know why this is happening and what needs to happen in order for the ecosystem to be balanced again. The students will be encouraged to try to use some of the vocabulary of the tier two and tier three vocabulary from the standard as well.

- Students could create a poem, song, video collage, picture collage, skit, Prezi, Glogster, short story, or more to share what they learned and their hypothesis. By taking this approach the students will have to do additional research and it will challenge them to dive deeper into the curriculum in order to support their creative piece. As shared above, the students will be encouraged to try to use some of the vocabulary of the tier two and tier three vocabulary from the standard as well.
**Authentic Assessment Ideas:**

Performance Assessment- Students will be assessed based on their final creation. Each student’s final product will look different but should relate to the student’s real life, be student directed and structured as well a showcase of direct evidence of knowledge. The teacher will look for:

1. Integration of the students food web/chain creation
2. The student’s hypothesis and the validity of it in relation to the standards
3. Use of key tier two and three vocabulary
4. Explanations as to why they made the hypothesis and claims they made
5. A cohesive final product that captures the problem, hypothesis, potential solution, and ways to see to a change.