

JSD 3D Learning Activity Template

Grade: 6th

Title: The Potato Experiment

Utah Science with Engineering Education Standard (SEEd): 6.4.3 Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. Emphasize food webs and the role of producers, consumers, and decomposers in various ecosystems.

Key crosscutting concept(s) (CCC): Cause and effect: mechanism and explanation; stability and change; energy and matter: flows, cycles and conservation.

Key science and engineering practice(s) (SEP): analyzing and interpreting data; asking questions or defining problems; constructing explanations and designing solutions.

Materials: Three regular potatoes, one potato peeler, each student should have three pieces of lined paper. Three ziplock bags marked #1, #2, and #3.

Time: 1 class period for the lesson. Two weeks for daily observations.

Teacher background, key content information and hints: Teacher should be familiar with the scientific process, specifically making and recording observations.

Prior knowledge that students need: Students should have some knowledge of the scientific process, specifically how to make and record observations.

Learning Activity Plan

These three aspects of a lesson should be identified in your learning activity.

Gathering: (Obtain Information, Ask Questions/Define Problems, Plan & Carry Out Investigations, Use Models to Gather Data and Information, Use Mathematics/Computational Thinking.)

Reasoning: (Evaluate Information, Analyze Data, Use Mathematics/Computational Thinking, Construct Explanations/Solve Problems, Develop Arguments from Evidence, Use Models to Predict & Develop Evidence.)

Communicating: (Communicate Information, Argue from Evidence (written & oral), Use Models to Communicate).

Phenomenon: Students should each be given three pieces of blank lined paper and told to label them Potato #1, Potato #2, and Potato #3. Student should also draw two columns on the left side of the paper, one labeled *date* the second labeled *time*. Teacher should stand in front of the class and begin to peel potato #1, while doing so the teacher should discuss the scientific process, telling the students that during the course of this experiment they will be required to make and record observations. All observations should be made no matter how obvious they seem as you will not know what is important until the completion of the experiment. Examples of observations should be given so students understand how important observations and recordings are in completing scientific experiments. The teacher should also discuss the questioning process that occurs during scientific process. After the first potato is peeled it should be passed around the room so that every student in the room touches the potato. Students are told they should look carefully at the potato and make any observations they can, such as texture, color, smell etc. After everyone in the room has touched the potato it should be collected and placed in a small ziplock baggie marked Potato #1. The same process should occur with the peeling of potato #2, teacher peeling and conducting an classroom discussion. After #2 is peeled it is placed directly into a ziplock bag, having only been touched by the teacher. The teacher then washes their hands and the 3rd potato, the returns to the front of the room to peel potato #3, which is also placed in a ziplock bag without having been handled by the students. Wrap up of the classroom discussion should include making sure the students record the different ways in which all three potatoes were dealt with. #1 was peeled and touched by everyone in the classroom, #2 was peeled and touched only by the teacher, and #3 was washed and handled by the teacher after they washed their hands.

Students should then be told they will need to make daily observations and recordings with the potatoes noting any changes they observe.

After two weeks the teacher will again conduct a classroom discussion, about what the students have observed and what conclusions they can draw from their observations.

Having conducting this experiment previously the #1 potato will be very decomposed and nasty looking and smelling. The other two potatoes will be less decomposed, #2 will be more discolored than #3. This should allow for a great opportunity for students in the classroom to draw conclusions about micro-biological effects on the potatoes small ecosystem.

Assessment of student learning: Students observation papers, and participation in the classroom discussion at the initial lesson, as well and the conclusion of the lesson after two weeks of observations has been completed.