

Lesson Objectives:

- Define “disturbance” and how they can impact the ecology of an ecosystem.
- Describe the disturbances of a longleaf pine savanna and how native plants respond.
- Conduct an experiment following the steps of the scientific method.

SC Science Standards:

- Grade Five: 5.S.1A.1-8, 5.L.4A1-2, 5.L.4B.4
- Grade Six: 6.S.1A.1-8, 6.L.4A.1, 6..L.5B.4-5
- Grade Seven: 7.S.1A.1-8, 7.L.3B.2, 7.EC.5A.1-3
- Grade Eight: 8.S.1A.1-8, 8.E.5C.1
- Biology 1: H.B.6A.1-2, H.B.6C.1

Safety Tips:

- Poking holes into the bottom of the “ecosystem” containers can be dangerous, as it involves potentially sharp objects (pencil tips, scissors, fork, etc.). This step in the activity set-up should be done or at least supervised by an adult.
- Choosing a spot to scoop soil from a nearby natural space could expose the student/child partaking in the activity to a number of environmental hazards: weather, biting insects, plants that irritate the skin, sharp edges of litter, and others not listed here. Care must be taken to ensure the participant is in a safe space to learn.

Worksheet Answers:

1. Fire impacts an area in an uneven way, where some parts of a fire will burn very intensely at high temperatures and other spots may not be burned at all. This will change the plant and animal communities in these areas, but also the water quality/quantity and soil properties.
2. Some plants may die, others may be only burned, and many may not be impacted at all. This will disrupt the overall spatial vegetative composition, by totally clearing out some spots and barely affecting others and will create openings for new or existing plants to establish or show new growth.
3. Answer is dependent on area where soil is collected.
4. Answer is dependent on spots chosen throughout one’s home/yard to conduct the experiment.
5. Answer is dependent on what you believe will happen!

Assessment Ideas:

- **OBSERVE:** Students are asked to create a data sheet where they are to routinely record observations for each of their “ecosystems”, which could be used to gather their understanding of the experiment and the questions being asked. An idea for this would be to take photos throughout the experiment or provide written responses in a chart as shown in the lesson video. These observations could follow any of the prompt recommendations listed below:
 - Color/texture/estimated water content of soil
 - Estimated amount of sunlight received in a day
 - Descriptions and tallies of any plant (or other) life seen living in the “ecosystem”

- **COMPARE:** The basis of this experiment is comparing the reactions of different “ecosystems” under different environmental conditions. Progress updates from students’ work where they compare and find reasoning in what they observe throughout the experiment could serve as intermittent assessments on students’ understanding of the activity over time.
- **PRESENT:** This experiment follows each step of the scientific method, which create a wide array of opportunities to assess learning. Students can present their experimental findings to their class in a presentation, as a video, with a poster, or with a more formal lab report following the standard IMRAD structure (Introduction, Methods, Results, and Discussion).

How to Explore Further:

- This experiment was done in a controlled environment by creating containerized “ecosystems”. It could also be conducted as a field experiment, where students disturb (dig into, rake, remove some sort of vegetation, etc.) a small area of land in their yard and observe what happens. Record what their soil looks like, and then what plants grow in and responds to the available space and nutrients over time. These observations could be compared to a control part of their yard in which they did not disturb.
- Encourage students to go on a walk in a patch of woods near their home and look for signs of disturbance (fallen tree, minor flooding from a recent storm, etc.). Have them take observations on how this small area differs from the forest around them. As a further challenge, have students compared a human disturbed space (agriculture field, parking lot, lawn, etc.) and have them take observations on this space versus an adjacent natural setting. Discuss how human disturbances and natural disturbances can differ, and the reasons behind this.