Explore Nature!

An open inquiry activity to get hands-on with nature

Objectives:

At the end of this activity, youth should be able to:

- Observe the characteristic of life: growth and development
- Use tools to make observations and gather information
- Identify difference in organisms life cycles

Time to complete activity: 15 minutes

Skill level: Beginner (grades 3-6)

Background/Setting the Stage:

Science is the study of the natural world around us. Science is further broken up into fields that study a specific an aspect the natural world. For example, Biology (bio- life and ology- the study of) studies all living things and how they function, while Geology (geo- earth and ology- the study of) studies Earth's physical structures and properties. Even though the entire field of science, each field studies very different things. However, the process in how they study their subject is the same! All of science is done through a process called the Scientific Method. The Scientific Method is a series of steps to help understand a problem based on observation. The very first step in the Scientific Method is making an observation. Observations are so important in science that it is what separates science from non-science (or science fiction). To make an observation, one must be able to collect data or information by uses your senses. What was observed is then used to generate a question that can be tested. (E.g. You observe an apple falling from a tree and wonder if all things fall at the same speed.)

Here we are going to practice making observations and forming questions by exploring nature itself!

Materials:

- (2) Optional: Foldscope Deluxe kit- includes the following:
  - Field microscopes
  - Magnify glass (+4)
  - Tweezers
  - Transfer pipettes (+4)
  - Slides and cover slips
  - Blunt end scissors
  - Micro well plate
  - Micro centrifuge tube

  (Available at the state office)
- Beaker or other container
- Pond water (with algae and/or duck weed)
- Soil- with invertebrates (earthworms, etc…) or different soil types
- Different types of leaves and seeds
- writing utensil
- (2) Large and (2) small petri dishes
- Digital scale
- Optional: Safari Ltd Life cycle kit models with key (available at the state office)

Methods

1. Organize and spread supplies around a large table
    - For larger groups, categorize materials and place on individual tables (e.g. soil table, plant table, Pond water table, life cycle table, etc….)
2. Print off Explorer handbooks for each participant
3. Instruct participants they may use any of the tools provided to explore and make observations. They must not destroy or damage any of the materials (e.g. do not kill or harm any bugs, do not trip apart leaves if there is not enough for each person.)
4. Allow participants the time allowed to make and record their observations

Reflection Questions (Journal or Discussion)

- Ask participants to share information they wrote for one observation.
- How was what they did similar to what scientist do?
- Choose one of the questions written on the observation sheet "what does it make you wonder?" and explain how you could design an experiment to test and answer this question.
- Have participates then identify the parts of the scientific method using an example from this activity.

Supplemental Information:

Purdue Extension, Nature of Teaching: https://ag.purdue.edu/extension/nature/Pages/default.aspx Purdue Extension, Soil Health: https://www.asec.purdue.edu/soilhealth/index.html
The Nature Conservancy, Nature Works Everywhere: https://www.natureworkseverywhere.org/resources/

Vocabulary:

Science- The study of the natural world. Science is study through the process of the scientific method.

Scientific method- Series of steps to help answer a question that was made based on an observation. The steps include: 1) Generating a questions based on an observation, 2) develop a hypothesis, 3) conduct an experiment to test that hypothesis, 4) Using the outcome of the experiment to support your conclusion.

Observations- Using your senses to collect information (sight, hearing, touch, taste, smell) and generate a question.

Hypothesis- Testable prediction to the answer a question

Experiment- Performing a controlled test or investigation to answer a question

Conclusion- Using the information collected as a result of your experiment to determine if the hypothesis is correct or incorrect.

Resources:

Foldscopes- https://www.foldscope.com/

Life cycle models- https://store.safariltd.com/collections/safariology-science-toys (Butterfly, Frog, Mosquito, Bee, Plant, Ladybug, Ant)