TRB 3:2 - Investigation 4 - Plot Studies

Summary

Students use a plot map to study the plants and animals living in a small area of their environment.

Group Size

Small Groups

Materials

For each team of 2-3 students

- Plot Study Journal Pages (pdf)
  hand lens
  thermometer
  meter stick or tape measure
  4 golf tees
  clipboard
  4 meter length of string

Additional Resources

Books:

- *Time-Student Library, Our Environment*
  , Publisher Time-Life, Alexandria, Virginia, 1999.

Background for Teachers

In this activity, students will closely examine a small area of the school ground (or other local environment) in order to discover what kinds of plants and animals live there. Student should be encouraged to look for ways in which the nonliving elements in the environment (sunlight, soil, air, water, and temperature) provide the living organisms with food, water, space, and shelter.

Safety Concerns

Most small critters that will be encountered around your school are harmless, but before taking student outside, be sure they understand that they should not touch bees or wasps or other bugs of which they are unsure.

Intended Learning Outcomes

1. Use a Science Process and Thinking Skills
2. Manifest Science Interests and Attitudes
4. Communicate Effectively Using Science Language and Reasoning

Instructional Procedures

Pre-Assessment/Invitation to Learn

Suggest to the class that sometimes we don't look very closely at the environments around us. Because of our inattention, we miss many of the interesting things going on around us. Suggest that there may be things in the classroom that no one has noticed. Often these things go unnoticed because they are small or in an out-of-the-way place. Sometimes we don't notice things because they have always been there and we simply don't pay any attention to them.

Tell the class they are going to practice their observation skills by examining a section of the

classroom closely and taking notes on what they find. To do this they will need to change their perspective. Ask if students have seen the movies "A Bug's Life" or "Honey I Shrunk the Kids". In those movies, the world was shown from the perspective of someone very small. Discuss with the class how that perspective was different from their perspective of the world. Encourage the students to try to get down to the level of a bug and look at the environment as the bug would.

Divide the classroom into sections and assign each team of 3-5 students a section to explore. You may wish to set some limits or ground rules such as:

Everyone must stay on the ground.
Certain designated areas (closets, cupboards, etc.) are off limits.
Don't disturb other students' personal items.

Provide students with hand lenses and a notebook or clipboard. Tell them to use drawings and written notes to record what they find.

After the teams have explored, allow them to share with the class what they discovered. Tell the class that these kinds of observations are similar to what a type of scientist called a naturalist does. Discuss the work of Jane Goodall or other naturalists.

Instructional Procedures

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Activity

1. Choose an area close to the school for your class to study. An area that is out of the way such as a side or front lawn area where students do not play will work best. Flower beds, shrubs, and/or trees will provide more variation for your class to explore. Fields, parks, or churches close to the school may also work as a study area.
2. Divide the class into teams of 2 or 3. Explain that each team will be doing a thorough study of a small section of a local environment. They will classify everything they find in their area as living or nonliving and record that they see on Plot Study Journal Pages (pdf). Observations may be recorded using both words and drawings. It will probably be necessary to have students estimate the numbers of some plants and animals they find in their area. Work with students on sampling techniques, such as counting numbers in a smaller area and then multiplying by the number of smaller areas in the larger area.
3. Give each team a copy of the Plot Study Journal Pages (pdf), Plot Map (pdf), a hand lens, a thermometer, meter stick or tape measure, 4 golf tees, a clipboard, and a 4-meter length of string.
4. Once outside each team of students should find a place to lay out their study plot. They will do this by measuring off 1 square meter, marking the corners with a golf tee, and wrapping the string around the tees to enclose their plot. Encourage students to try to find a area that is not all lawn, such as under a bush or tree, a place where there are a few rocks or sticks, a flower bed, along a fence where the grass is longer, etc.
5. Explain that scientists often study he environment by making observations and carefully recording what they see. If students do not know the name of a particular plant or animal have them write a description (for example: fuzzy-leaf plant, or long bug with lots of legs).
6. Set a few rules that should be followed during the activity. They may include:

Do not disturb the study area.
It is OK to carefully turn over rocks, leaves, or sticks.
Do not dig or uproot plants.

Use the hand lens to make close observations of small items.
Record the temperature of the air and the soil.
Don't step into the study area.

7. You may want to give students a time period of at least 15 minutes that they must observe their areas. Often students will search their area over quickly and feel they have seen everything there is to see. Encourage them to just sit and watch for a while, to get close and systematically search the whole area.
8. Teams should work together to complete their Plot Study Journal Pages (pdf) and Plot Map (pdf).
9. After students have finished their observations have pairs display their Plot Study Journal Pages and discuss and compare what they learned. The following questions may be helpful:

What did you observe about the soil in your plot? Do you think it is good for plants? Why?
Where do you think the plants and animals in your plot get water? Is there a source of water they can rely on? What do you think would happen to the plants and animals in your plot if they didn't get water for a day? ...a week? ...a month?
What evidence of water do you actually see in your plot? Where does it come from? Would you classify your plot as very dry, dry, wet, or very wet? Why?
Think about the things that every living thing needs from it habitat, such as food, water, air, shelter, space. Does your plot have everything in it that is needed by everything that lives there? If not, how do the things living there get their needs met?
If your plot is in an area that is cared for (mowed, watered, primed. etc.) how might it be different if it were allowed to grow wild and not cared for? If it is in a wild area, how might it be different if someone cared for it like a garden?
Use the coordinates points on your Plot Map and tell me what you found at (B,3), (A,2), etc.

Extensions

Math-

In this activity students use coordinate points to record and communicate the locations of things found in their study plot. Encourage students to use the coordinate point when discussing the location of things in their plot. Discuss with students other places, such as maps, where coordinate points are used to find locations. *(Standard V, Objective 1)*

Language Arts -

Imagine you are a scout ant in a backyard environment. Describe the living and nonliving things you find during one day. (If they have seen "Honey, I Shrunk the Kids," or "A Bug's Life" this will help them picture their adventure in more detail.) *(Standard VIII, Objective 6)*

Art -

Draw a picture from an ant's perspective of the surroundings. *(Standard III, Objective 1, 2)*
If your study area is in a location that will not be disturbed, leave the golf tees in place and return and observe changes in the plots. Make copies of the teams' original Plot Maps so students can make comparisons each time they visit their plots. To help students locate their plots, have them draw a map of its location. They could use identifying features, such as a tree, and then count paces in a certain direction and record it on their maps. *(Standard III, Objective 2)*

Science-

If students have made terrariums, allow them to collect a few plants or animals from their plots to put in their terrariums. Have students consider whether the plants' and animals' needs will be met in their terrariums before they take them. After a few weeks, any specimens could be returned to the study plots. *(ILOs 1, 2, 3, 4)*

Homework & Family Connections

Students may wish to observe a plot at home. Provide them with strings, golf tees, and journal pages to use at home. Encourage students to ask family members to help them learn the names of the

organisms they find in their plots. Have students compare their home plots to their school plots and share with the class any interesting organisms or nonliving things they find.

Assessment Plan

Ask students to pick one organism that they found in their study plot and list the things it needs to survive. Have them explain how the organism gets the things it needs from the environment where it lives.

Authors

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