

Life Science Lesson Plan

Ant Architecture

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8th Grade - General Science

Time Required: (3) 55 Minute Class Periods

Observations can last for days/weeks

1. Objective(s): The student will be able to understand how ants create different habitats depending on the environmental conditions present.

The students will be able to observe the different behaviors of the ants that allow them to survive in different environments.

The students will be able to design their own investigations, evaluate that design, and identify the variables and/or controls in an experimental setup.

Students will be able to report their results in data tables and charts, interpret that data, and evaluate the data to develop explanations and/or predictions.

P.A.S.S. - C 3.2, P 2.1, P 3.1 - 3.6, P 4.1 - 4.3

2. Equipment:

science notebooks

ants (3-4 dozen)

(4) ant farm villages (3 habitats)

water

eyedropper

sand

bark

cedar chips

top soil

apple

potato

fish food

encyclopedias
science magazines
hand lenses
black construction paper
computer with Internet access
External Anatomy of the Ant Worksheet
Cool Facts about Ants Handout
4 Lab Groups of 5-6 Students

3. Instructional Plan:

Engage – Work with your students to create a KWL chart. Ask them what they already *know* and what they *wonder* about ants. Make a list of student responses under “K” for know or “W” for wonder. Encourage students to focus their thinking on the design of ant shelters and the materials used in making them. Pass out “Cool Facts about Ants” handout and the “ Ant External Anatomy Diagram”. (15-20 minutes)

Explore – Allow students some time to complete the handouts then, take them outside for observations of ants in action. Have them collect data on what they see. They can also draw the different species of ants that they encounter. When they return to the room, have them start to research ants and their habitats by using textbooks, encyclopedias, science magazines, and the Internet. (35-40 minutes)

Explain – Review ant habitats and have students discuss their observations of ants from their science notebooks. Show them the ant farm village and the ants. Allow your lab groups to discuss and examine the different habitats as well as the variables of each. Remind students that they need to be able to identify the control group of ants, the independent variable, the dependent variable, and the controlled factors. Students can

choose several variables such as a dark environment v. light, they can choose different substrates such as sand v. topsoil, or they can use different food sources. Allow time for student questions. (20 minutes)

Extend - Lab groups should set up their habitats and design their own experiments testing one of the variables discussed previously. Once they have created their habitats, they need to write down their hypothesis and predict which habitat the ant will chose and why. They also need to create data table to record the results. The table should include time increments and conditions. After they have created their data tables and made their prediction, they may transfer in the ants and start their observations. Once the observations are complete, have students journal over the following questions:

How does the environment change the way that ants and humans build shelters?

All animals - even humans - have to deal with changes in the environment. How would the ants adapt to these changes? How would we humans adapt?

Compare and contrast the ants you have seen in movies and on television shows versus the real ants.

Are ants pests or do they serve a purpose in the environment?

Should humans destroy ant populations near housing developments? (40-50 minutes)

Evaluate - There are many ways to assess this lab including: observations, note-booking of results, their data tables, class discussions, etc. Was their original hypothesis correct or incorrect? Was there any bad data and why might this have occurred? What conclusions can you find based on your data? Can they defend their results. Can this experiment be duplicated with the same results? (20-30 minutes)

4. Resources: Rose State College - DTD Team, McDougell Littel Science Textbook, Ant Rebecca Steffoff. Benchmark Books, 1998. Ants Elaine Pascoe. Blackbirch Marketing, 1998.

www.unclemilton.com/products/AntFarm,

<http://www.myrmecology.org>,

<http://www.surfnetkids.com/ants.htm>,

<http://www.insect-world.com>

5. Instructional Strategies: In order to deal with multiple learners, choose lab groups that have a higher level learner paired with a lower level learner. Also, you should put those who struggle with some of these concepts closer to the front of the room. Modify the worksheet for those that may need it by simplifying some of the questions and omitting others all together. The groups should be kept as small as possible so that more people can experience this hands-on activity. The lecturing should also be kept to a minimum so that the students have more time for experimentation on their own.

6. Assessment Tools: There are a variety of assessment tools that you can use for this experiment. You can use classroom discussions, peer teaching, note-booking, and a traditional paper-pencil test to determine that the lesson's objectives have been met.