Antlion Pit Building Investigation

Scientific Background

Antlion larvae build pits in loose sandy soil. They are adapted to dig in this type of soil, which may commonly be found around wooded dunes, on open forest floors, and near dry, tree-lined river banks. Sometimes antlion larvae are found in the sandy soil of flowerbeds or in overgrown city lots. The sandy environment allows the antlion larva to build a pit that serves as a trapping device for its prey, such as small insects, that inadvertently fall into the pit. The sandy walls of the pit make it difficult for the prey to escape.

Scientific experimentation is the process of testing a hypothesis. The factors that affect the experiment are called *variables*. There are three kinds of variables: independent, dependent, and controlled.

The independent variable is the one that is purposely changed. There should only be one independent variable for each experiment.

The dependent variable changes in response to manipulating the independent variable. It is the variable that is being observed.

The variables that are not changed are called controlled variables.

In the Antlion Pit Building activity, students follow the steps of scientific experimentation to find the answers to these questions:

Given the same types of soil, do large antlions make different-sized pits than small antlions?

Given different types of soil, will antlions make different-sized pits?

This table outlines the experiment process.

Hypothesis (examples)	Independent Variable	Dependent Variable	Controlled Variable(s)
Large antlions make larger pits than small antlions in the same type of soil.	the size of antlion	size of the pits they build (measured by the pit's diameter)	the type of soil, temperature, amount of moisture, and so on
Antlions makes smaller pits in coarse brown sand than in fine white sand.	the type of soil (coarse or fine sand)	size of the pits they build (measured by the pit's diameter)	the size of antlion, temperature, amount of moisture, and so on

This activity can be found by navigating to the Antlion screen, then clicking the antlion pit icon at the bottom of the screen.

Vocabulary

- adaptation
- adapted
- controlled variable
- dependent variable
- hypothesis
- independent variable
- prey
- soil

*Vocabulary definitions can be found in the **Backyard Bugs** Glossary.*

Thinking Question

Have students write hypothesis statements and describe how they will test their hypotheses. Are there hypothesis statements that won't be able to be tested given the virtual experiment in ***Backyard Bugs***?

Exploratory and Extension Activities

Additional Exploratory and Extension activities are available in the *Backyard Bugs* Teacher's Guide.

Antlion Reading

Read aloud from *Crawdads, Doodlebugs & Creasy Greens* by Doug Elliott (Native Ground Music, 1995, ISBN: 188320609X). Note that the doodlebug is the nickname for the antlion. It is the larva of an adult antlion and it resembles a dragonfly. Talk about the lore of the creatures that you read about.
Ask students the following questions:

How do you greet a doodlebug?

How do you greet other people, such as friends, relatives, neighbors?

How do people from different cultures greet each other?

Antlions Around the World

Use a large monitor or video projector to present a lesson on antlions in various cultures. Visit www.antlionpit.com/culture.html for reference information. Include the riddle by Aldhelm at www.antlionpit.com/aldhelm.html, in Latin and English, when discussing the different names for antlions from different languages. Use a world map to identify countries where the different antlion names are used. The folklore section on this site has information from the United States, Antigua and Barbuda, Australia, South Africa, and Sri Lanka.
Follow this activity by having students write a paragraph creating their own folklore story about an antlion from their own fictitious country. Have students include an accompanying sketch.

Name: _____

Antlion Pit Building Investigation

Choose a hypothesis.
☐ Large antlions make larger pits than small antlions in the same type of soil.
☐ Small antlions make larger pits than larger antlions in the same type of soil.
☐ Same-sized antlions make larger pits in fine white sand than in coarse brown sand.
☐ Same-sized antlions make larger pits in coarse brown sand than in fine white sand.

Measure the antlion pit diameters and record your data in the table.				
Large Antlion	**Pit 1**	**Pit 2**	**Pit 3**	**Average Pit Diameter**
Pit Diameters in Fine White Sand				
Pit diameters in Coarse Brown Sand				
Small Antlion	**Pit 1**	**Pit 2**	**Pit 3**	**Average Pit Diameter**
Pit Diameters in Fine White Sand				
Pit Diameters in Coarse Brown Sand				

Which has the largest average pit diameter?	
☐ Large antlions in fine white sand.	☐ Large antlions in coarse brown sand.
☐ Small antlions in fine white sand.	☐ Small antlions in coarse brown sand.
Does this data support your hypothesis?	
If not, how would you restate your hypothesis?	

Answer Key
Antlion Pit Building Investigation

Choose a hypothesis.
□ **Large antlions make larger pits than small antlions in the same type of soil.** *Student answers will vary.*
□ **Small antlions make larger pits than larger antlions in the same type of soil.** *Student answers will vary.*
□ **Same-sized antlions make larger pits in fine white sand than in coarse brown sand.** *Student answers will vary.*
□ **Same-sized antlions make larger pits in coarse brown sand than in fine white sand.** *Student answers will vary.*

Measure the antlion pit diameters and record your data in the table.				
Large Antlion	**Pit 1**	**Pit 2**	**Pit 3**	**Average Pit Diameter**
Pit Diameters in Fine White Sand	*6.5 cm*	*7.5 cm*	*6.2 cm*	*6.73 cm*
Pit diameters in Coarse Brown Sand	*3.6 cm*	*4.2 cm*	*4.0 cm*	*3.93 cm*
Small Antlion	**Pit 1**	**Pit 2**	**Pit 3**	**Average Pit Diameter**
Pit Diameters in Fine White Sand	*2.5 cm*	*3.3 cm*	*3.7 cm*	*3.16 cm*
Pit Diameters in Coarse Brown Sand	*2.9 cm*	*2.1 cm*	*2.7 cm*	*2.56 cm*

Which has the largest average pit diameter?	
√ **Large antlions in fine white sand.**	□ **Large antlions in coarse brown sand.**
□ **Small antlions in fine white sand.**	□ **Small antlions in coarse brown sand.**
Does this data support your hypothesis?	
Student answers will vary.	
If not, how would you restate your hypothesis?	
Student answers will vary.	