



Ant Lion Lesson Plan

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Description

This lesson uses ant lions to engage students in developing observation skills and building an insect collection. Students will be involved in an inquiry exercise, discover how ant lions trap their prey, and apply what they learn to building their own insect collection.



Student Outcomes/Objectives

- Students will be able to observe three qualitative and quantitative observations
- Students will practice asking research questions
- Students will practice forming a hypothesis
- Students will be able to describe how ant lions catch their prey



Standards

Benchmark 2:

Make observations. Ask questions or form hypotheses based on those observations, which can be explored through scientific investigations.

Benchmark 3:

Based on observations and scientific concepts, ask questions or form hypotheses that can be explored through scientific investigations.



Time Estimate

Two 50-minute class periods



Material

- Ant lions (Ideally, 1 per group of 3 students, if not available, these can be collected in central Oregon, around Black Butte area on Highway 20 (bring fine mesh, trays, trowels, and small containers with lids for transportation) See resources for other sources)
- Fine dirt (enough to fill each ant lion container 1/3 – 1/2 full)
- Clear plastic party cups (2 per ant lion: 1 to hold ant lion, 1 to sift dirt into on day 2)
- Petri dishes (1 per ant lion)
- Wire mesh squares (4" square, small holes, 1 per ant lion)
- Ants (day 2, 1 per ant lion)
- Newspaper (to keep ant lion area clean)

<http://cropandsoil.oregonstate.edu/gk12>

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- Magnifying glasses (optional)

Warm-up materials

- Treats
- Question Word Die (directions for making Question Word Die included at end of lesson)
- Pictures for warm-up game (1 per group of 3 students)



Worksheets

DAY 1 Ant Lion Worksheet
DAY 2 Ant Lion Worksheet



Vocabulary

Qualitative Observations: Observations about objects that are based on shape, size, form, color, odor (for example: The pencil is hard, bright yellow, smooth)

Quantitative Observations: Exact observations about objects that can be counted or measured. (The pencil is 6 cm long, weighs 8 grams, and has a 1 cm lead.)

Hypothesis: An educated guess or prediction



Background Information

If possible introduce steps of the inquiry cycle
(<http://www.inquiry.uiuc.edu/index.php>) to students before this lesson.



Lesson Plan

Set up ant lions in an undisturbed area in the class at least 24 hours ahead of the lesson.

DAY 1 (50-min period)

DAY 2 (50-min period)



Extensions/Resources

<http://www.antlionpit.com/>

<http://lancaster.unl.edu/enviro/pest/Nepline/antlions.htm>

http://www.antlionfarms.com/antlions_for_education (this company sells ant lions for educators to use in the classroom; we always collect our own.)

http://www.activelearningsystems.com/_order/order.htm (For ordering question cubes if you do not wish to make your own.)

http://www.ket.org/education/guides/pd/cheapthrills_intermediate.pdf (pg 12 has directions to make question cubes from paper)



Teacher Keys

N/A

Teacher Worksheet

Day 1



I. Warm-up Activity: Brainstorming Questions (15 minutes)

- a. Introduction
 - *Asking questions is the first step in scientific inquiry, this is followed by designing experiments in order to learn new things about the world around us*
 - *Sometimes it is difficult to think of questions to ask*
 - *One method is to brainstorm as many questions as possible, and then go back and rule out the questions which you are not going to try to answer at that time*
 - *This game will help you think of questions*
- b. Divide into teams of 3 students
- c. Have students take notes under the heading “Asking questions”
- c. Give each team a picture
 - *I have a die with question words. I will ask someone to roll the die. When he / she rolls the die, your team will have 1 minute to write down as many questions as you can, starting with the given question word, about the picture (refer to question die lesson).*
- e. Teacher asks student to role the die.
- f. After one minute, teams count up their questions, the team with most questions gets a treat.
- g. Rotate pictures and repeat as many times as time permits.

II. Introduction to Forming Hypothesis (10 minutes)

- a. Introduce scientific method
 - write steps on board, have students copy in science notebook

Scientific Inquiry

Ask questions (Ask)

Investigate (Do)

Create (Learn)

Discuss (Write and Share)

Reflect (Think and Plan again)

- b. Review definition of hypothesis
 - *We have practiced asking questions; now will focus on making hypotheses*

- Write on board

Hypothesis (Plural Hypotheses)

A possible explanation for a set of facts/observations

Must be able to test it
Must be able to falsify it (prove it wrong)

- Examples:

Drop paper clips on the floor. Ask the question: why did the clips fall down?

- Is there a giant magnet in center of earth?

- Even though I do not think so, did I apply force while throwing the clips?

c. Practice hypothesis:

- Why am I wearing _____ pants?
- Get several hypotheses from students

c. Next step is to test the hypothesis...talk about that in future lessons

III. Introduction to Mystery Containers (2 minutes)

- *You will observe a mystery container and make hypotheses about what you see*
- *It is very important that you do NOT BUMP the table or touch the container.*
- *Answer the questions on the worksheet with as MUCH detail as possible.*
- *Make hypotheses (explanations for what you observe)*

IV. Describing the container (20 minutes)

- Carefully set out containers (preferably set out containers the day before)
- Hand out worksheets
- Have students make observations and come up with a hypothesis

V. Clean-up (3 minutes)

Student Worksheet

DAY 1



Mystery Container Worksheet

1. Look at the container and make detailed observations of it. Describe it in detail so that someone who reads your paper but has not seen the container will know what kind of container you have described.
2. Make observations and describe what you see inside the container. It is **VERY IMPORTANT** that you do not touch or bump the container – bumping will destroy the cone / pit.
3. Make two suggestions (hypotheses) about how the cone / pit in the container could have been formed. Use your imagination but be realistic!
4. Draw the container and what you see inside it.

Teacher Worksheet

DAY 2



I. Introduction (5 minutes)

- a. Have students place papers from Day 1 on their desk
- b. Have students work in groups of three (same groups as Tuesday)

II. Observe mystery containers/ants (15 minutes)

- a. Have students place an ant in the container, and make observations on what happens
- b. Have students answer questions 1 & 2 on Day 2 Student Worksheet)

III. Investigating the cone/pit (15 minutes)

- a. Have one student per group pick up a magnifying glass, wire mesh, plastic cup, Petri dish
- b. Have students carefully sift the dirt through the wire mesh into the extra cup, and place the organism they find in the petri dish for observation
- c. Students answer question #3 on Day 2 Student Worksheet

IV. Observing ant lion behavior (10 minutes)

- a. Have students carefully tip the ant lion back into the container with the dirt, and observe what happens.
- b. Answer questions 4 & 5 on Day 2 Student Worksheet

IV. Clean-up (5 minutes)

Student Worksheet

DAY 2



Mystery Container Worksheet

1. Describe what happens when the ant is put into the cone in the mystery container.
2. Make two hypotheses about why/how this happens.
3. Describe **or** draw what you see when the sand is sifted through a screen.
4. Describe what happens when the mystery organism is placed back in the container.
5. Make a new hypothesis about what happened to the ant when it was placed in the cone.