



Insect Investigation

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Target Grade: K-1st grade, Science

Time Required: 2 days (75 minutes per lesson)

Standards

Next Generation Science Standards (NGSS):

- **1-LS1-1.** Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

Lesson Objectives

Students will:

- Use elements of nature to create a model of a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.
- Be able to identify physical features on insects that contribute to insect survival.

Central Focus

In this lesson, students will become entomologists by using the great outdoors to go on a bug hunt. Throughout the lesson, students will investigate the physical features of bugs. By comparing bugs and humans, students will create a model of a solution to a human problem by mimicking the anatomy of bugs.

Key words: engineering design, problem solving, outside, nature, systems

Background Information

In the introduction, the teacher may want to take out the book reading depending on time and just do a think-pair-share activity about students' favourite bugs and why.

The teacher will use an anchoring chart (large Post-it note) to write, define, and provide pictures of key vocabulary during the lesson that students can refer to during the lesson.



In this lesson, students will explore the basic anatomy of bugs to be able to solve a human problem. Throughout the lesson, students will use the following vocabulary to complete their investigation:

- Entomologist: a person who studies insects
- Insect: a small animal that has 6 legs and usually 2 sets of wings
- Observe: to watch carefully and take note
- Antennae: a pair of long thin feelers on the head of an insect that helps it sense things
- Compound Eye: an eye that has many small units
- Head: the front section of an insect's body
- Thorax: the middle section of an insect's body
- Abdomen: the hind/back section of an insect's body

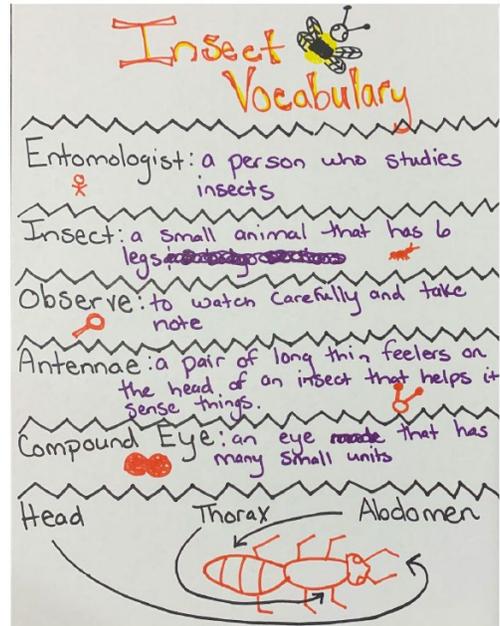


Figure 1: Example of Anchor Chart

At the end of the lesson, students will use [Flipgrid](#) to present their final project. Flipgrid is an interactive website that allows students to respond to a prompt by the teacher with a video.

Students will have the option to view their peers' videos and reply with a video. If the students do not have access to a camera or video, they could choose to do a group discussion or class presentation to share their projects. Another alternative would be to share student presentations via gallery walk. For instruction on how to get started with Flipgrid use this [link](#).

Materials

- *The Bug Girl: A True Story* by Sophia Spencer
- Anchor chart paper
- Markers
- Flipgrid teacher account
- 3 - 5 Pictures of insects native to your area
- 1 Pencil & Clipboard (per student)
- 1 *Insect Diagrams* handout (per student)
- Pictures of insects in your area
- 1 *Insect Hunt Reflection* handout (per student)
- Natural materials - rocks, sticks, leaves, flowers, grass, etc.



Instruction

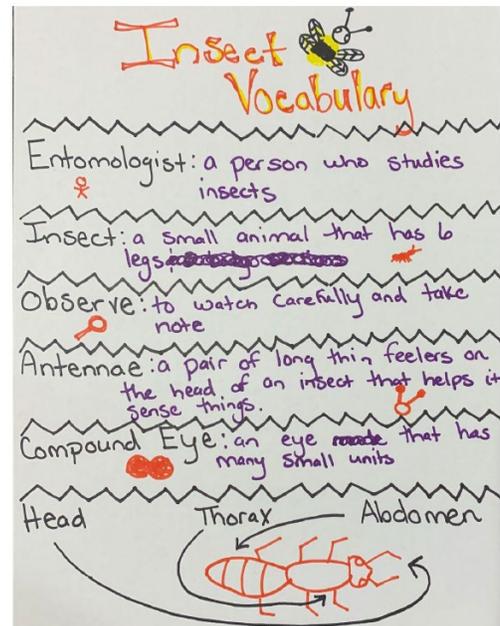
Day 1

Introduction (15-20 minutes)

- Read aloud *The Bug Girl: A True Story* by Sophia Spencer
 - For read aloud: <https://www.youtube.com/watch?v=LI3YHrpvIVk>
- Tell students that today, they will be entomologists and study insects, just like the scientists in the story *The Bug Girl*.
- After reading the story, have students complete a think-pair-share with the questions:
 - Are insect and humans similar? Why or why not?
- Show students pictures of insects common to your area.
 - Ex: ladybugs, grasshoppers, ants, bees, etc.
- Ask students to name each insect and describe what they like best about it. Encourage students to talk about what specific parts of the insect they like.
- Introduce the essential question:
 - What can we learn from the structure of insects and how they survive, to solve a problem humans have?

Background building (15 minutes)

- Choose an insect picture to have students analyze in depth.
- As a class, discuss the following question:
 - What are things you notice about the insect that would help it survive (shelter, hunt, eat, protection, etc.)?
- Have the same discussion about a second insect while displaying a picture of the insect.
- As students discuss the second insect, point out how their answers and descriptions of the insect are similar and different from the first insect.
- To introduce the vocabulary, at the top of an anchor chart paper #1 write "Insect Vocabulary".
 - Entomologist, Insect, Observe, Antennae, Compound Eye, Head, Thorax, Abdomen
- As you introduce each word, write it on an anchor chart with the definition and draw a symbol or simple sketch to represent the word.
- Encourage students to draw connections to the vocabulary words and the photos of examples of insects by identifying parts of an insect in the photos.





Exploration (45 minutes)

- Distribute the *Insect Diagrams* handout, pencils and clipboards.
 - On the handout, students will draw and label the insects they find outside.
- Take students outside to go on an insect hunt.
- Have students search for different types of insects and share with the group once they have found one.
- As a class, work together to identify each insect students find.
 - If two of the same species of insect are found, discuss how students can tell they are the same species.
- Have students sketch the insect in one of the squares on their *Insect Diagrams* handout.
- Once the class has found four different species of insect, return to the classroom to discuss the following questions in groups:
 - Describe your insects.
 - What does each insect use to grasp objects and what does each use for protection? How can you tell?
 - What insect do you think is most protected if it gets attacked by other insects and why?
 - What parts of the insect might be similar to parts of a human?
 - How can we use what we learned about the structure of your insects and how they survive, to solve a problems for humans?
- Record student ideas on Anchor Chart paper to be used for the next day.

Day 2

Introduction (10 minutes)

- Begin class by going over the students' ideas from the previous day.

Investigation (20 minutes)

- Instruct students to draw their designs on a piece of paper and label all parts.
- Once finished, have students participate in a gallery walk to provide one glow and one grow to students' designs.
 - Student might need a refresher on good and bad feedback. Show students the following video to see what helpful feedback looks like:
<https://www.youtube.com/watch?v=hqh1MRWZjms>

Design (30 min)

- Once finished, take the students back outside and begin building a prototype of their design with materials found in nature.
- Have students use Flipgrid to create a video of themselves presenting their designs.



Closure (15 minutes)

- Finish class by students completing their *Insect Hunt Reflection* handout.

Differentiation

ELL:

- Translate all vocabulary
- Simplify vocabulary when necessary
- Translate sentence frames
- Use pictures and diagrams to enhance understanding

Learning Styles:

- Verbal: Provide learners with the opportunity to verbally report on their learning instead of writing.
- Visual: Model activities and expectations for students to see.
- Kinesthetic: Provide hands on learning opportunities using materials from nature.
- Verbal: Provide opportunities for turn and talk and small group discussion.
- Interpersonal: Provide independent writing and think time.
- Intrapersonal: Encourage partner talk.

Special Needs:

- Provide learners with the opportunity to draw a picture and label the picture instead of writing a sentence.
- Allow students to demonstrate their understanding verbally, instead writing a response.
- Partner students up with a peer who can mentor and guide them throughout the lesson.
- Chunk the lesson into several smaller lessons.
- Provide additional time when needed.

Assessment

Formative: Participation in Whole Group and Partner Discussions

- The teacher can use all group discussions to assess students' prior knowledge and understanding throughout the lesson.
- The *Insect Diagram* handout can be used by the teacher to ensure students are participating during the bug hunt. This can also be used to track students' note taking during the lesson.



Summative:

- The *Insect Hunt Reflection* will allow the teacher to check students understanding of the complete lesson.
- The flipgrid project presentation on human solution model will allow the teacher to assess individual students by students presenting and explaining their model.

Name: _____ Date: _____

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INSECT HUNT REFLECTION