

# Bay Area Scientists in Schools Presentation Plan

Lesson Name: Build-a-Bug!

Presenter(s): \_\_\_\_\_

Grade Level: K Standards Connection(s): Life Science: Observation and Classification

Next Generation Science Standards:

**K-LS1-1.** Use observations to describe patterns of what plants and animals (including humans) need to survive.

**K-ESS3-1.** Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<ul style="list-style-type: none"> <li>• Developing and Using Models               <ul style="list-style-type: none"> <li>○ Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.</li> <li>○ Use a model to represent relationships in the natural world. <b>(K-ESS3-1)</b></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>ETS1.B:</b> Developing Possible Solutions               <ul style="list-style-type: none"> <li>○ Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions to other people. (secondary to <b>K-ESS3-3</b>)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Patterns               <ul style="list-style-type: none"> <li>○ Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1)</li> </ul> </li> </ul>

Common Core Standards:

ELA/Literacy:

**RI.K.1.A:10.**

Actively engage in group reading activities with purpose and understanding.

a. Activate prior knowledge related to the information and events in texts.

**SL.K.3** Ask and answer questions in order to seek help, get information, or clarify something that is not understood.

Mathematics:

**K.MD.A.2** Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference.

**K.CC** Counting and Cardinality

**MP.2** Reason abstractly and quantitatively.



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FOSS Connections:

Kindergarten Module 1: Animals Two by Two  
Investigation 1: Goldfish and Guppies

### **Abstract and Background:**

In this presentation students will learn to how to identify insects and distinguish them from arachnids and other “bugs.” We will focus on insect characterization based on their characteristic three body parts: head, thorax, abdomen. First the students will work together using several laminated body parts to build an insect, which has 3 parts, or an arachnid, which has 2 parts. Finally, the lesson will culminate in an art project in which students design and create their own anatomically correct insect or spider.

### **Vocabulary/Definitions:**

3 – 6 important (new) words (On board front center or pre-written on printer paper & posted):

- **head**: where the eyes, mouth, and antennae are
- **thorax**: the middle of the three body parts where the legs and wings (usually) are
- **abdomen**: the last body part
- **wings**: structures that allow insects to fly; they usually have 2 to 4
- **antennae**: structures that allow the insect to detect odors and communicate
- **entomology**: the science and study of insects
- **insects**: arthropods that have a body with three parts: head, thorax, and abdomen, 6 legs, 4 wings (usually) and 2 antennae.
- **arachnid**: arthropods with 8 legs, a head, and abdomen, but lack antennae and wings

### **Materials:**

*What will you bring with you?*

- Build-a-bug laminated body parts with both insects and spiders—25 total pieces. Body parts for insects will be numbered 1) head 2) thorax 3) abdomen. While body parts of the arachnid will be numbered 1) head 2) abdomen.
- Story book about bugs to be read prior to the lesson and to engender questions
- Pipe cleaners to make insect legs
- Colored Circles cut from construction paper
- Googly eyes
- Paper plates as a canvas for bug building
- Bug magnifying boxes

*What should students have ready?*

- Glue

### **Classroom Set-up:**

- Students should be at the rug for the story and for the build-a-bug puzzle
- Students should be at their desks or stations for the art project



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## **Classroom Visit**

### **1. Personal Introduction & Topic Introduction: 5-10 Minutes**

- Say our names, where we are from, and what we do
- Ask kids the question: if you studied an insect, which one would you study and why?
- Ask kids the questions: Who has observed an insect before? How did you know it was an insect?
- What do you know about insects? What would you like to know about insects? This can be done in the form of an "I know/ I wonder" table on the board.
- Not all "bugs" are insects!

### **2. Learning Experience(s): 35-40 minutes**

#### Activity 1: Build-a-bug!

Hand out a laminated insect or spider part to each student. (Make sure the pieces are distributed such that all bugs will be complete!) The students will now have time to find their partners that help them form the complete bug. At the end of this matching game, it should be apparent that some students are in groups of 3 with 3 body parts, while others are in groups of 2 with 2 body parts.

Ask all the groups of 3 to stand on one side of the room. Ask all the groups of 2 to stand on the other side of the room. Ask the students what they notice about this activity. Can any group identify their insect?

Indicate to the students that all the groups of 3 are holding insects while all the groups of 2 are holding arachnids. Ask the students to flip over their picture. There will be a number on the back. Ask the students with a number 1 on their picture to hold it up in the air. What body part do they think this is? This is the head. Ask the students with number 2 on their picture to hold it up in the air. For the insects, this is the thorax. Write this word on the board and the definition. Ask the students with number 3 on their picture to hold it up in the air. This is the insect and arachnid abdomen. What do they notice is the same about the arachnids and the insects? What is different? Indicate that all insects and all arachnids can be characterized in this way. Just as humans have two legs and dogs have 4 legs, insects have 3 body parts and arachnids have 2 body parts. Are there any other body parts the students can observe on their picture? Here are some similarities and differences between insects and arachnids that can be brought up in the discussion. Write the vocabulary words on the board.

Insect

3 body parts: head, thorax, abdomen  
abdomen

Have 2 antennae for sensing and smelling their environment

have analogous structures called pedipalps

Have 6 legs

Sometimes have wings

Arachnid

2 body parts: head,

Do not have antennae, but

Have 8 legs

Do not have wings

If there is time, you can tell the students the name of the insect they are holding. Collect the laminated body parts.



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### Activity 2: Build A Bug art project

Explain to the students that scientists frequently use models to represent important facts that they have learned and in order to share the information they have gathered with other scientists. Now the students are going to make their very own insect model!

Ask the teacher to help the students divide into their groups. Students should return to their desks for this portion of the lesson. Prepare the appropriate number of art materials for each table. The students will be able to choose the color and design of their creation, but they should try to keep their insects anatomically correct. Will a scientist be able to identify their creation as an insect? Why or why not? Scientists can go around and help the students with their designs and with the application of the lesson.

### **3. Wrap-up: Sharing Experiences and Building Connections: 10 minutes**

Emphasize the difference between insects and arachnids and that the term "bugs" is a more general classification of all creepy crawlies.

### **4. Close & Connections : 5 Minutes**

Bug song for the students to sing  
-Thanks and good-bye!  
-Clean-up

**TOTAL 60 Minutes**

### **Differentiated Instruction:**

***English Learners:*** Repeat directions, if necessary, and physically model how to create the insect. Vocabulary words can be visually demonstrated and/or redefined in very simplistic terms.

***Advanced Learners:*** Have students label the body parts on their insect models.

## **Follow-up - After Presentation**

### **ELA Activity:**

Students respond to the following journal prompt:

-Write a letter to a friend telling them what you learned about insects and/or arachnids. Draw a picture of an insect or arachnid.

### **Mathematics Activity:**

-As a class, create a graph displaying the number of body parts on an insect, e.g. 2 antennae, 6 legs, 1 head, etc.

### **Outside of School:**

-Visit museums or observe bugs in their natural environments.



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