

Community in the Classroom Presentation Plan

Lesson Name Insect Physiology

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Grade Level 5th **Standards Connection(s)** life sciences: multicellular organisms have specialized structures

Abstract:

This extremely hands-on presentation will explore insect physiology and the systems humans and insects have in common. An introductory activity involving the entire classroom will give students the opportunity to experience the insect sense of smell. Through crafts, games, and puzzles, three different stations will demonstrate the insect skeletal, circulatory, and digestive systems.

Vocabulary/Definitions:

physiology: the science of organisms and how their bodies work

exoskeleton: a hard shell that supports and protects an insect

molting: shedding the entire exoskeleton

circulatory system: body parts that circulate fluid with nutrients and oxygen

hemolymph: insect blood

digestive system: body parts that digest and help food move

Materials:

We will bring all materials necessary for the presentation. The introductory activity requires scented strips of paper. Station 1: straws and string. Station 2: rectangular planter full of water, food coloring, tubes, pumps. Station 3: puzzles & party blowers.

Classroom Set-up:

Three different learning stations will be set up beforehand by the presenters. If possible, the circulatory system station should be conducted outside, because it involves water. The students will separate into three groups and rotate to each station.

Classroom Visit

1. Personal Introduction: 3 Minutes

We are students from UC Berkeley, in the Environmental, Science, Policy and Management Department. We belong to a group called Organisms and the Environment, and we all study different organisms. Candice studies ants, Natalia studies spiders, and Lisa studies mealybugs (each of us will introduce ourselves). We would like to introduce the idea of insect physiology, and share what we know about insects through a variety of activities.

Topic Introduction: 20 Minutes

What is physiology? We'll briefly discuss what the term means, and how it relates to different systems within an organism. What are some examples of human systems? For instance, does any one know what the olfactory system in humans does? It allows us to smell. What do we use our sense of smell for? Ants use their olfactory system to recognize one another. (Here we tape a strip of paper with one of three scents to the students' hands. Like ants, the students smell one another to identify who is in their group. Once they have found their groups, we will begin the next activities).

2. Learning Experience(s): 40 Minutes

Each group will spend 10 minutes at each station, then rotate to the next.

Station 1 (Candice- The Skeletal System): In insects, the skeleton is on the outside and the muscles attach from the inside to make it move. Molting is a "problem" that insects have to solve, since their skeleton is on the outside. When they want to grow, they have to shed their exoskeleton whereas human bones grow inside and the skin grows too. The students will create small models an insect leg and compare them to those of a human. To do this, we will use string and bendy straws. The strings will be tied and threaded through the straws, as muscles, and the



straws are the exoskeletons. When the string is pulled, the straw bends just like a muscle pulling to move a leg.

Station 2 (Natalia- Circulatory System): I will ask about the human circulatory system and explain that it is a closed system of tubes/veins. Conversely, insects have an open circulatory system where hemolymph (insect blood) flows freely around the organs carrying nutrients. This will be displayed by means of colored water diffusing through water with the help of a pump (i.e. to mimic a heart). Students will take turns pumping food coloring through the water, as nutrients are pumped through the hemolymph.

Station 3 (Lisa- Digestive System): I will present a large, black background shaped like the silhouette of an insect. This will have outlines of where the insect digestive organs are located (similar to a puzzle board). There will be pictures of each organ labeled with its name on one side, and its definition on the back. Each student will be given a specific organ at the beginning of the activity. As each part is defined and discussed, the students will place their organ on the insect. There will also be an outline of a human with the corresponding organs, and I will ask them to identify what organs in humans serve the same function as those of the insect. I will show pictures of different insect mouthparts (chewing vs. sucking), and then give them "party blowers" that resemble how a proboscis (sucking mouthpart) functions.

3. Wrap-up: Sharing Experiences and Building Connections 5 **Minutes**

Putting the pieces together – how will students share learning, interpret experience, build vocabulary?

Rather than asking specific questions, we will open the discussion and ask for volunteers to share what they learned (i.e. what was their favorite station, word, organ, etc). A handout will be left with the teacher; students can color and label pictures of what they learned.

4. Close: 2 **Minutes**

How can kids learn more? Thanks and good-bye! Clean-up.

We will refer the students to different websites and address any last minute questions.

TOTAL 70 **Minutes**

Follow-up – After Presentation

Suggest students write a letter explaining "How we learned about _____?"

List or attach examples of activities, websites, connections for additional learning.

Attach worksheets, hand-outs, visuals used in classroom presentation.

