

Community in the Classroom Presentation Plan

Lesson Name Survival strategies and adaptation in insects

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Grade Level 3 **Standards Connection(s)** Life Science/ Adaptation in physical structure or behavior can improve an organisms' chance for survival

Abstract:

Your opportunity to tell teachers and kids what's going to be fun and interesting about your visit!

Students will be learning about camouflage, an extremely successful form of adaptation used by insects and other animals as a strategy for survival. I will first talk to them about the concept of camouflage and some key words. Students will get a chance to see exciting images of camouflaged insects blending so well in their background environment that makes them very difficult to distinguish. Their task will be to try and identify the hidden insect! They will also take a look at some insect museum specimens as well as some live insects in jars that represent good examples of camouflage. Students will be asked to try and match these insects to several created habitats, which I will also provide for demonstration, to identify which aids them camouflage best. Finally, students will make drawings of insects with various colors and shapes, and try to match them with specific illustrations of backgrounds that I will be giving them.

Vocabulary/Definitions:

3 – 6 important (new) words

Adaptation: changes in an organism over time to survive in its environment

Camouflage: hide by coloring or covering to look like the surroundings (environment)

Habitat: where organisms (animals and plants) live, their natural environment

Survival: to stay alive

Predator: animal that hunts and eats others

Prey: animal that gets eaten

Materials:

What you'll bring with you

- Laminated pictures of insects
- Pinned museum insect specimens in boxes
- Live insects in jars
- Boxes with created habitat (grass, leaves, twigs, flowers etc) which students can match with insects to better camouflage them.
- Crayons

What students should have ready (pencils, paper, scissors)

Pencils

White paper for drawing

Scissors

Classroom Set-up:

Student grouping, Power/Water, A/V, Light/Dark, set-up/clean-up time needed

- Activity 1: Student grouping (groups of 5) to view pictures, identify hidden insects and discuss.
- Activity 2: Two large table sets in the front of the classroom to place specimens (one for museum specimens and boxes and one for jars and boxes). Students will come in front to observe them (in two groups), then change tables. They will complete an exercise for this activity (attachment 2).
- Activity 3: Student grouping (groups of 5) for drawing.
- 10 minutes needed for clean-up.



Classroom Visit

1. Personal Introduction: _____ **5** _____ **Minutes**

Who are you? What do you want to share with students and why? How will you connect this with students' interests?

I am a graduate student and scientist at Cal and I am here to talk to you about the organisms I work with for my research at the University, about insects! Today we are going to talk about some strategies that these organisms use to hide from their enemies and survive in their environments.

My interest in insects started when I was about your age. I grew up in a small island in the Mediterranean Sea, and as a kid I loved to play in fields around my home, that of course were filled with insects! I was impressed by the way they worked and communicated with each other, and also by their amazing colors and structure. There are some great facts about insects and the way they look that people don't pay attention to some times because they are so tiny. Their shape and color for example are the way they are for a reason. We will learn about these things today, and you'll realize why they are such amazing animals and why I got to be so interested in them!

Topic Introduction: _____ **5** _____ **Minutes**

Big Idea(s), vocabulary, assessing prior knowledge. What questions will you ask to learn from students?

Have you ever wondered why grasshoppers and caterpillars are green? Has any of you ever seen a stick insect before? What does it look like? Even if you haven't, where do you think it got its name from? It looks like this for some reason and today we'll find out why it became to look the way it does, over time. We'll have a look at some alive insects and some museum specimens to understand why they look the way they do and what advantage they have with these structures and color. We will find out about survival strategies, what these organisms do to stay alive and avoid their enemies. We will learn about adaptation, camouflage, habitat and which organisms we call predator and prey.

2. Learning Experience(s): _____ **25** _____ **Minutes**

Demonstrations, hands-on activities, images, games, discussion, writing, measuring... What will you do, what will kids do? Describe in order, including instructions to kids.

Activity 1 (8-10 min): Identify the hidden insects (prey) in their habitat and learn about the need of camouflage for survival against enemies (predators): We will divide students into groups of 5. I will give each group laminated pictures of insects in their environment. Each group will have some pictures of: a) insects that are well camouflaged in their habitat and it's very difficult to distinguish them, b) insects that are camouflaged (coloration matches background) but it's easy to tell apart the insect (should notice how structures changed over time to resemble leaves, fungi, flowers etc), c) insects don't camouflage but rather have bright coloration and stand out on the background.

I will also be giving to the students illustrations of the insects showing the basic body structure to have a visual aid of what they are looking for in the pictures (see attachment 1 - I will give one to each group).

I will ask students from each group to:

- a)** identify the insect hidden in each background
- b)** describe how the pattern of camouflage resembles the background (color, shape, additional structures) and how that could be beneficial to the insect (prey) - it can help it hide from its enemy (predator).
- c)** identify which of the pictures represent well camouflaged insects, and which not. What disadvantage could those brightly colored insects have? Could this be bad for survival and why?

I will then explain to them that although butterflies are brightly colored they actually have toxins in their body that kill their predators when they eat them. So the bright coloration is good for those insects because it is a warning to their predators: "don't eat me because it will kill you". It is simply another form of defense against the enemy, for survival.

Activity 2 (8-10 min): Match live insects and museum specimens with backgrounds to enhance learning of the concept and understand how color and structure are important features for camouflage: Students will come in the front around tables in two groups: one group around table with the museum specimens and the second group



around table with the live insects in jars, and then they will change tables. The tables will also have boxes with created habitats (grass, leaves, twigs, flowers) which students can use to try and match with insects. The students will spend about 5 minutes around each table and do a little written exercise on matching habitats with specimens.

I will ask students from each to:

- a) take a careful look at the material of each table and think which specimen matches better with each habitat
- b) complete the written exercise to match insects to habitats (see attachment 2 – I will give one to each student)

Activity 3 (8-10 min): Draw insects and match them to illustrations of habitats to share their learning experiences: Students will form groups of 5. I will give each group one page with illustrations of habitat (grass, soil, twigs, flowers, leaves) (see attachment 3 – I will give a different one to each group). We will also give them paper and crayons to draw insects and scissors to cut them and give them shape. They can have a look at the specimens on the tables or the images from activity 1 for ideas on what type of insects to draw.

I will ask students from each group to:

- a) use their imagination to give the insects they draw various shapes and colors to better match with their habitat illustration (each group will have a different one).
- b) when they finish they can visit each other's groups to compare their drawings and try to match them with other students' habitat images.

3. Wrap-up: Sharing Experiences and Building Connections 10 Minutes

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

- What have you learned today about insects and camouflage?
- What do the words habitat, adaptation, and survival mean?
- Why do insects need to camouflage themselves and blend well with their background?
- Name some insects you learned today that use camouflage to hide from their enemies and survive.
- Do predators (hunter animals) also need to camouflage? Why would that help them? Is it also good for survival and how does it differ from the prey (hunted animal). Camouflage is actually a strategy used by both prey and predator, to increase survival; it helps prey to hide from its hunter and it helps predator to hide from its prey to get close to it and attack it more easily.
- Today we only looked at insect camouflage, but this strategy is actually used by all animals (even by humans when they go safari or hunting!!). Can you think of any other animals that use camouflage to either hide from the enemy or hide from the prey to attack it more easily? (tiger, giraffe, frog, lion, squirrel, deer, white polar bear, camel). Do you know which of these are prey and which are predators? In what places are these found? Does the environment they live in tell you something about the color they use for camouflage? (desert, African savannah, tropics, green forests, arctic snow).
- Bonus Question!: There is one excellent example of an animal that changes colors every time it is found in a different background environment to blend better in it and camouflage itself. Do you know which one? (arctic fox: in spring and summer it has dark coat to match with brown dirt; on fall and winter it changes to white coat to match snow!). Is it a prey or a predator? (Predator). (Chameleon also changes colors but that's to express its different moods and as a result it matches better with the background).

4. Close:

5 Minutes

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

Things to remember from today:

- a) Insects and other animals have certain shapes and colors because they help them to better blend in their background **environment**, in their **habitat**. This strategy is called **camouflage**.
- b) These **organisms** have changed over a time of millions of years to look like that, to obtain these **adaptations** because they improved their chances to **survive**.
- c) Both **predators** and **prey** use the camouflage strategy in different ways but in both cases it increases survival. Predators use camouflage to get close to their prey without being noticed and attack it better to eat it. Prey on the other hand use camouflage to hide from their enemy and stay alive.
- d) You can observe camouflage in your every day life, when you take a walk in a park or next time you visit the zoo. Notice how different animals have different colors and shapes and how well they match with the environment they usually live in. Insects are usually seen everywhere you just need to be a bit careful to observe them because they are tiny! Large animals you see in the zoo don't usually live in these



environments although people try to make the space they keep them similar to their home environment. Try to remember where these large animals came from, and how their **natural habitat** looks like compared to how they look like! You'll realize that camouflage is much more common than you imagined and it can be found all around us, you just have to know about it and be able to identify it!!!

TOTAL 50 – 60 Minutes

Follow-up – After Presentation

Suggest students write a letter explaining “How we learned about _____ camouflage _____?”

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

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

Game on camouflage for students:

<http://www.abc.net.au/beasts/playground/default.htm>

Game on insect camouflage for students:

<http://www.cals.ncsu.edu/course/ent425/tutorial/Ecology/camo/index.htm>

Very interesting activities for teacher, to extend the learning of camouflage:

<http://www.glc.k12.ga.us/BuilderV03/LPTools/LPShared/lpdisplay.asp?LPID=75959>

A nice website with facts and games that students can go to and explore the concepts they learned today, from camouflage, to habitat, to adaptation, to survival, to predator and prey!

<http://www.planetarkive.org/home.html>

Students can write a small essay about what they learned today and send it to me by email or post (email address: margarita@berkeley.edu, postal address: 137 Mulford Hall MC #3114, University of California, Berkeley, CA 94720-3114). In this essay they could also extend and relate what they learned today with observations they make in their everyday life or seen before on tv or at the zoo, e.g. where are brown squirrels or green caterpillars usually found, why do panthers have these colors and strips, why are camels yellow-brown, why are polar bears white).

