

Bay Area Scientists in Schools Presentation Plan

Lesson Name Plants Adapt to their Environments

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Grade Level 3

Standards Connection(s):

California Science Standards: 3rd Grade Life Science

Adaptations in physical structure or behavior can improve organisms change for survival.

- 1) Structures of living things help them grow, survive, and reproduce.
- 2) There are diverse life forms in different environments.
- 3) Living things change the environment they live in, some changes have bad effect on organism, some have good effects
- 4) When environment changes, living things respond (may be able to survive and reproduce or may die or move to new environment)

Next Generation Science Standards:

3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><i>Engaging in Argument from Evidence</i></p> <p>Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).</p> <ul style="list-style-type: none"> • Construct an argument with evidence, data, and/or a model. (3-LS2-1) • Construct an argument with evidence. (3-LS4-3) • Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-LS4-4) 	<p><i>LS2.C: Ecosystem Dynamics, Functioning, and Resilience</i></p> <p>When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. (secondary to 3-LS4-4)</p> <p><i>LS4.C: Adaptation</i></p> <p>For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all (3-LS4-3)</p> <p><i>LS4.D: Biodiversity and Humans</i></p> <p>Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)</p>	<p><i>Cause and Effect</i></p> <p>Cause and effect relationships are routinely identified and used to explain change. (3-LS2-1), (3-LS4-3)</p> <p><i>Systems and System Models</i></p> <p>A system can be described in terms of its components and their interactions. (3-LS4-4)</p> <p>-----</p> <p><i>Connections to Nature of Science</i></p> <p>Scientific Knowledge Assumes an Order and Consistency in Natural Systems</p> <p>Science assumes consistent patterns in natural systems. (3-LS4-1)</p>



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Common Core Standards:

ELA/Literacy:

RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

SL.3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

W.3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. (3-LS4-1)

SL.3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace. (3-LS4-3,(3-LS4-4)

FOSS Connections:

Grade 3 Module: *Structures of Life*

Investigation 3: *Meet the Crayfish*

Teaser: What would you do if you couldn't put on a sweater in the winter or go get a glass of water when thirsty? Since plants can't move, they have evolved other tools for dealing with changes in their environments. In this lesson, we will learn more about how plants adapt to their environments.

Objective: Students will understand that plants are able to handle environmental challenges using a variety of adaptations.

Vocabulary/Definitions: 3 – 6 important (new) words

Adaptation: changes made to work and live better in a certain environment

Climate: The weather conditions in an area over a long period of time

Drought: A long period of very little rainfall

Humidity: The amount of water in the air

Herbivore: An animal that only eats plants

Materials:

What will you bring with you?

Worksheets, game dice, cards, poster/sign with the different environments written on it with some pictures of that climate.

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

Pencils

Classroom Set-up:

Students should be sitting on the floor or carpet area when volunteers arrive.

Split students into groups of 4 or 5

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 and experiences?

Introduce each member, briefly, and why we study plants.

Topic Introduction: _____5-10_____ Minutes

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

1. We will introduce the concept of climate (Climate is like the long-term weather of a place, over the entire year and from year to year)

- What is weather? Can the students give examples?
- What is climate? Can the students give examples?
- We will write the definition of climate on the board/it will be on their handout

2. Finally, we will introduce the concept of adaptation (special parts or behaviors a living thing uses to survive the challenges it faces in its climate/environment)

- An animal example is how arctic penguins and seals have lots of blubber to keep them warm in the cold climate of the arctic
- A plant example is how water lilies have big floating leaves to get to the sun because it is dark underwater in an aquatic environment
- Can the students give examples? We will write the definition of adaptation on the board/it will be on their handout

2. Learning Experience(s): _____25_____ Minutes

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

Now we will break up into 2 climate groups: Desert and Jungle.

- In each group, we will have a poster of what the environment looks like, with some plants in each poster
- We will ask the students for challenges a plant must face living in an environment/climate like that
 - ex. in the desert it is hot and dry, and there is a LOT of sun
- We will ask the students to describe adaptations they see on the plants in the pictures that could help them deal with the environment
- We will then show/explain to them the challenges they will face in the adaptation game/these will be on their handouts



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Now we will break up into groups of 4-5 students for the game

- The students get to pick 5-10 adaptation cards as a group depending on time (they can pick multiple copies of the same card). Each card has an adaptation, a picture of a plant with that adaptation, and what challenges it can work for
 - The students will have a list of adaptations on their worksheets, and they will put the number they want next to each one
- We will play 5-10 rounds depending on time. Here's what a round will look like:
 - We will roll the die for each climate at the front of the room and read out the challenge.
 - In each group of 4-5 the students will hand us 1 adaptation card that allows their plant to deal with that challenge.
 - If the group gives us a card that works, we will give them a seed card (their plant survived and reproduced!)
 - They won't get back the card they gave us
- When we are done, each group will count how many seed cards they got.
 - They will write down how many seed cards they got on their worksheets
- Within the small groups, we will talk about what adaptations were the most important, and which ones they should have picked instead/picked more of
 - Write down which ones were most important to the climate they were in on their worksheets
- If time allows, we will then switch dice, and replay the game as if their plant is in the opposite climate.
 - At the conclusion, we will compare how the plant did in the climate it was adapted to, and the climate it was not adapted to.

3. **Wrap-up: Sharing Experiences** _15_____ Minutes

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

Now we will come back together as a full class

- Ask the desert groups: which adaptations were the most important?
- Ask the jungle groups: which ones were most important for you?
- Explain that different adaptations are necessary for different climates because of the different challenges that each climate presents.

Now we will ask for questions about the activity or general questions about Science/succeeding in Science

4. **Connections & Close:** _____10_____ Minutes

*What else might kids relate this to from their real-life experience? How can they learn more?
Thanks and good-bye! Clean-up.*

Talk about plants that might be grown in their gardens like tomatoes or basil. Talk about their adaptations to be appealing to and propagated by humans. Ask questions about being a scientist, etc.

Total 50 – 60 Minutes

Follow-up – After Presentation

ELA Activity:

Suggest students write a letter explaining “How we learned about plant adaptation...”

Send to:

Plant Biology Graduate Students
c/o Community Resources for Science
1611 San Pablo Ave Suite 10 B
Berkeley, CA 94702

Non-Fiction Reading Connections:

The Plant Hunters. Anita Silvey. Macmillan Children’s Book Group/ Farrar, Straus and Giroux Books for Young Readers.

This collection of botanist biographies expands the range of career resources.

<http://www.amazon.com/dp/0374309086>

Island. Jason Chin. Macmillan Children’s Book Group/Roaring Brook Press/Flash Point.

Great example of change over time; well prepared method of introducing adaptations and evolution.

<http://www.amazon.com/dp/1596437162>

Planting the Wild Garden. Kathryn O. Galbraith. Illustrated by Wendy Anderson Halperin.

Peachtree Publishers. 32pp. Trade ISBN 978-1-56145-563-8, \$15.95. (K–2) This charming picture book about seed dispersal helps young children understand that people, wind, water, plants and other animals can all have a part in helping seeds find a place to grow.

Bibliography. (RMM) IV <http://www.amazon.com/Planting-Wild-Garden-Kathryn-Galbraith/dp/1561455636>



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