



LESSON PLAN

ECOSYSTEMS GRADES 3-5

SUMMARY

In this activity students learn that an organisms can only survive in an ecosystem where its needs are met. They explore a variety of different ecosystems and study the interaction between living organisms—plants and animals—and non-living parts of their environment, such as soil, water and air. They also think about changes in ecosystems and the impacts of those changes on the living things that are a part of it.



NEXT GENERATION SCIENCE STANDARDS CORRELATION

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. [Clarification Statement: Examples of evidence could include needs and characteristics of the organisms and habitats involved. The organisms and their habitat make up a system in which the parts depend on each other.]

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.* [Clarification Statement: Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms.] [Assessment Boundary: Assessment is limited to a single environmental change. Assessment does not include the greenhouse effect or climate change.]

Science & Engineering Practices	Connections to Classroom Activity
Engaging in Argument from Evidence (3-LS4-3, 3-LS4-4) Other Science and Engineering Practices addressed by this lesson: Analyzing and Interpreting Data	<ul style="list-style-type: none"> • Students present an argument based on evidence related to how a change might affect an ecosystem or organisms from that ecosystem. • Students observe and interpret relationships between living and non-living components of ecosystems.



Disciplinary Core Ideas	Connections to Classroom Activity
<p>LS4.C: Adaptation</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>LS2.C: Ecosystem Dynamics, Functioning, and Resilience</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) (3-LS4-4)</p> <p>LS4.D: Biodiversity and Humans</p> <p>Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)</p>	<ul style="list-style-type: none"> • Students observe several ecosystems and the organisms within those ecosystems that survive well. • Students explore which organisms survive well within certain ecosystems and which cannot survive in certain ecosystems. • Students recognize how changes in certain ecosystems might affect organisms that live there.
Crosscutting Concepts	Connections to Classroom Activity
<p>Cause and Effect (3-LS4-3)</p> <p>Systems and System Models (3-LS4-4)</p> <p>Connections to Engineering, Technology, and Applications of Science</p> <p>Interdependence of Engineering, Technology, and Science on Society and the Natural World (3-LS4-4)</p>	<ul style="list-style-type: none"> • Students recognize effects of certain positive and negative human actions. • Students study the effect of changes to an ecosystem. • Students recognize that an ecosystem is a system that is described in terms of its components and their interactions.

PRE-ASSESSMENT QUESTIONS

Please see discussion questions located under the video. These can be discussed as a group or answered individually in student science notebooks.



ENGAGE

Bring in a photo or example of an animal or plant from the ecosystem where you live or nearby ecosystem with which the students are familiar. Ask students, what does this animal or plant need to survive? Does it rely on other animals for survival? Plants? Non-living things?

Explain to students that in this lesson they will be thinking about how living things interact with other living and non-living things to survive in their ecosystems.



EXPLORE

Give each student one of the Ecosystem Connection Cards (set aside the associated Ecosystem Change Questions for now). Have students get up and find other students in the room that have the same color card as they do (this will lead the students to form groups of 3-4). Have students sit with their group and discuss how the different things on the cards interact. They should write about the connections and interactions between these living and non-living things in their science notebooks individually based on group discussion.

When all groups have discussed on their own, allow each group to share the connections they found between the living and non-living components on their cards with the rest of the class.

MATERIALS

- Ecosystem Connection Cards (print in color and cut apart)
- Science notebooks
- Pencils

DIY Activity

- Large glass jar with a lid
- Mesh
- Scissors
- Rocks or gravel
- Activated carbon (available in the aquarium section of a pet store)
- Spray bottle of water
- Plants growing in soil (choose a type of plant that needs a lot of water)
- Moss growing in soil
- Extra soil
- Spoon



EXPLAIN



AS A GROUP, WATCH THE GENERATION GENIUS VIDEO: ECOSYSTEMS.

Then, facilitate a conversation using the Discussion Questions.

Return to the discussion from the ecosystem cards. What kind of ecosystem do their group's cards represent? What other components are there in that system? How do they interact? Give each group their Ecosystem Change Question (same color). Ask them to consider this change related to the ecosystem they have been discussing. Allow them to discuss as a group and then share their ideas with the class.



ELABORATE

Use the DIY Activity to create a class terrarium just like Zoë's from the video. Make a schedule for students to take turns observing the terrarium over the next few weeks to make sure the ecosystem is in balance and the components are surviving. Make adjustments as necessary.



EVALUATE

Provide students with another group of living and non-living things from an ecosystem (similar to Ecosystem Connection Cards). Individually in their science notebooks each student should list 2-3 ways these components interact in the ecosystem. You might also provide a scenario similar to the Ecosystem Change Question and give students the opportunity to answer in a few sentences.



EXTENSIONS

- Have students observe a nearby park, garden or even their schoolyard. What are the components of that ecosystem? How do they interact and depend on each other? How have humans impacted the ecosystem?



ECOSYSTEM CONNECTION CARDS AND CHANGE QUESTIONS

Bee	Tulip	Soil	Sun	Could a Tulip survive in a river ecosystem?
Rose	Butterfly	Soil	Sun	Could a butterfly survive if the temperature got much colder?
Frog	Pond	Rocks	Mosquitoes	Could a frog survive if the pond dried up?
Sun	Lizard	Cactus	Soil	Could a lizard survive in the snow?
Panda Bear	Bamboo	Sun	Soil	Could a panda bear survive in the arctic?
Ants	Soil	Grass	Spider	Could ants survive in the ocean?
River (fresh water)	Trout	Small Fish	Rocks	Could a trout survive if the river contained salt water?
Eagle	Squirrel	Oak Tree	Soil	Could the squirrel survive if oak trees were replaced by palm trees?
Coral	Tropical Fish	Crabs	Rocks	Could tropical fish survive if the coral dies?
Salt Water	Whale	Shark	Fish	Could a whale survive in the desert?
Pine Tree	Owl	Mice	Soil	Could the owl, mice and tree survive if the soil washed away?