

STINKY CECIL

IN OPERATION
POND RESCUE



PAIGE BRADDOCK

TEACHER'S GUIDE

Curriculum Connections and Activity/Discussion Guide

The activities in this guide align with Next Generation Science Standards for grades 3–5.



STINKY CECIL

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AMP! Comics for Kids

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GRADE LEVEL: 3–5

Subject

Science: Food Webs, Habitats, and Ecosystems

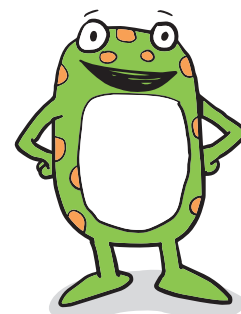
Content Standards

Next Generation Science Standards



Overview

Students will read *Stinky Cecil in Operation Pond Rescue* and discuss the food web and habitat of Cecil's pond. Then, they will do research on the pond's inhabitants and create posters to show what they have learned about the ecosystem.



Grade 3

- * Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death. [NGSS 3-LS1-1]
- * 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. [NGSS 3-LS4-3.]
- * 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. [NGSS 3-LS4-4]



Grade 4

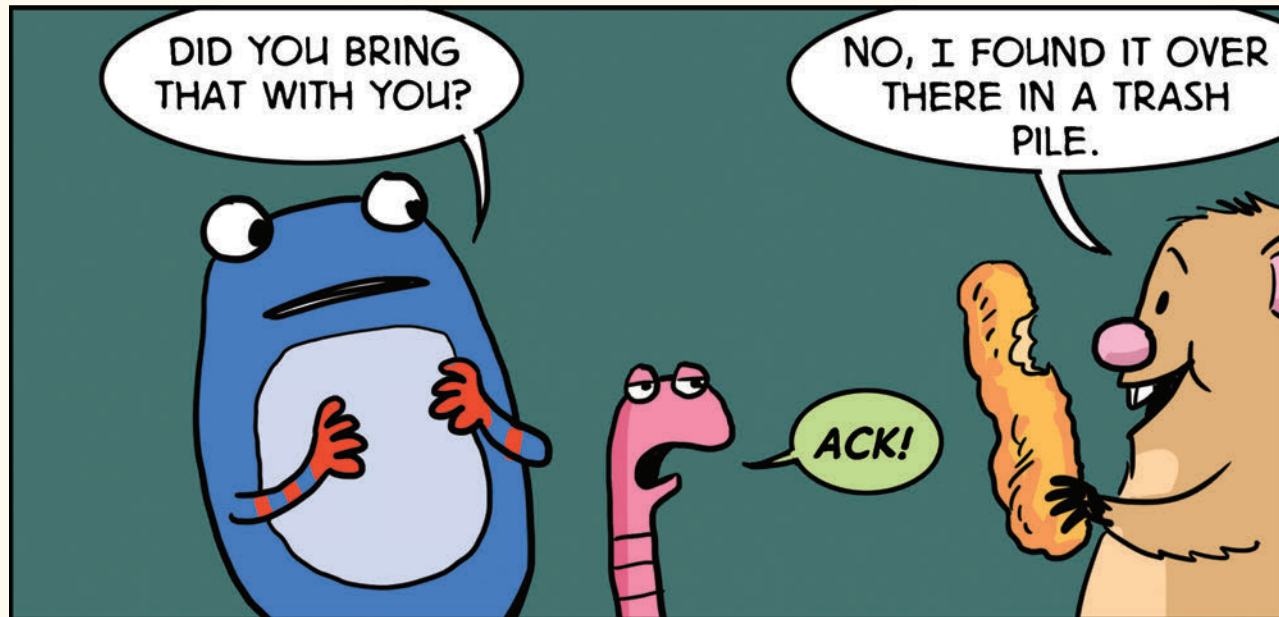
- ✱ Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. [NGSS 4-LS1-1]

Grade 5

- ✱ Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. [NGSS 5-PS3-1]
- ✱ Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. [NGSS 5-LS2-1]

Objectives

- ✱ Students will find text evidence of the habitat and needs of the animal characters in the book.
- ✱ Students will do research to find additional information about each animal and its place in the pond ecosystem.
- ✱ Students will create posters showing their new knowledge about the pond's food web and ecosystem.



Materials

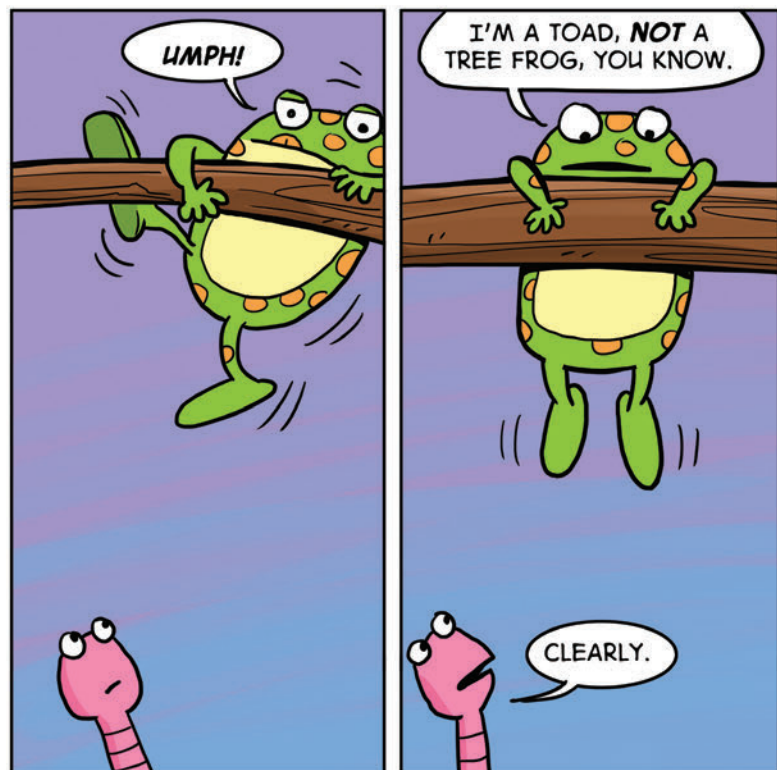
- ✱ Copies of *Stinky Cecil in Operation Pond Rescue*
- ✱ Chart paper or whiteboard and markers
- ✱ *Pond Inhabitants* worksheet
- ✱ *What's the Difference?* mini poster
- ✱ Poster or butcher paper
- ✱ Markers, paint, or other art supplies for making posters

Vocabulary

- * **Anthropomorphize**: to attribute human characteristics to something that is not human
- * **Earthworm**: a segmented worm that burrows in the soil and feeds on soil nutrients and decaying organic matter
- * **Ecosystem**: all of the living things (animals, plants, etc.) in a given area, interacting with one another and with the nonliving components of the environment (sun, water, soil, climate, etc.)
- * **Endangered**: a species of plant or animal that has so few individuals left that it is at serious risk of dying out or becoming extinct
- * **Food chain/web**: the series of steps showing how each living thing gets food and energy
- * **Frog**: a smooth-skinned amphibian with long legs for jumping that lives in or near water
- * **Habitat**: the area where an animal lives that fulfills its needs, such as food, water, soil, temperature, and shelter from predators
- * **Invertebrate**: an animal without a backbone, such as a worm, insect, spider, or mollusk
- * **Lizard**: a long-bodied reptile with four legs and a tapering tail
- * **Mammal**: an animal that has a backbone, breathes air, gives birth to live babies, and grows hair
- * **Radio**: a communication system that sends invisible electromagnetic waves through the air
- * **Radio receiver**: a device that detects and receives radio signals
- * **Radio transmitter**: a device that sends out radio signals
- * **Reptile**: a cold-blooded animal that is covered in scales and has a backbone
- * **Salamander**: an amphibian that looks like a lizard but lives in water and has smooth skin
- * **Toad**: a dry-skinned, short-legged type of frog that reproduces in water and lives its adult life on land

Time Frame:

1-3 Class periods



Procedure

Before Reading

1. Tell students that they will be reading a story about animals that live in and around a pond. Their purpose for reading this book will be to learn more about the creatures in the story and the ecosystem in which they live. Activate students' prior knowledge by asking them to turn and talk to a partner about any animals they may have seen in the environment near school or home.
2. On chart paper or a whiteboard, create a three-column chart and label the columns *What We Know*, *What We Wonder*, and *What We Learned*, respectively. Have students share what they know about a pond ecosystem and record their knowledge in the first column (*What We Know*). Then, have students share what they would like to learn about a pond environment and record their thoughts in the second column (*What We Wonder*). Tell students that after they have read the book and done some activities, they will fill in the final column with what they have learned (*What We Learned*).
3. Allow a few minutes for students to look through *Stinky Cecil in Operation Pond Rescue* without reading the text.
4. Ask students to predict what they think the story will be about and who the characters are. Remind them that in comics, information comes from pictures as well as words (and the way they work together). Have students make predictions based on visual cues.

During Reading

5. Read through the book as a class, using the discussion questions and information below.

p. 8–9: Describe the environment shown on these pages. How is it different from the environment shown on the previous pages? (*The pond is a mostly natural environment and the previous environment has a lot of manmade buildings, roads, etc.*)

Explain to students that an ecosystem is all the things, living and nonliving, in an area that interact and work together as a whole system. Have students point out the non-animal parts of the pond ecosystem (*water, plants, trees, grass, rocks*) that they see in this illustration. What are some other nonliving components of the ecosystem (*air, temperature, soil*) that they might not be able to see? Tell students that they will meet the animal inhabitants of this ecosystem as the story goes along.



Procedure Continued

p. 10–15: Who are the animal characters in this story so far, and what kinds of animals are they? (*Cecil is a toad; Sprout is a frog; Jeremy is an earthworm.*) What kind of animal do you think Rayray is?

Do the characters in this story act like real animals? (*No.*) What are they doing that real animals wouldn't do? (*They talk; they are playing a game.*) Explain to students that in this story, the animals are *anthropomorphized*, which means they act like people. The author, Paige Braddock, based each character on a real animal and included some aspects of the animal's true nature, but she made up their personalities for the story. As students read the book, have them look for animal behaviors that might be true to life and behaviors that the author most likely made up.

p. 16: What does “five-day life span” mean? (*Five days is the expected or average amount of time an adult fly will be alive.*) Does every individual of a species live to the expected life span exactly? (*No; it is an average. Some individuals will have longer or shorter lives.*) Here are the average life spans of some other animals in this book:

- Hamster, 4 years (*in captivity*)
- Earthworm, 2–5 years
- American toad, 5–10 years
- Red-tailed hawk, 10–15 years
- American human, 78 years

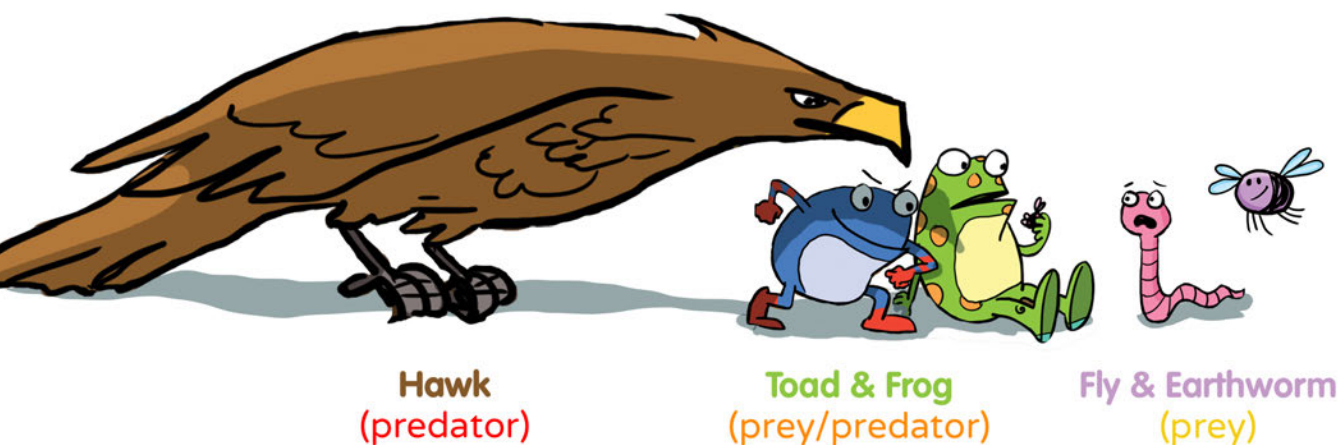
What are some factors that might affect the life span of an individual animal? (e.g., *predators; disease; environmental changes like droughts, floods, fires, pollution, etc.*)

p. 23: What is a mammal? (*A warm-blooded vertebrate [has a spine] animal with hair or fur that has live young.*) What are some other types of animals that you know? (e.g., *reptiles, amphibians, birds, insects, fish, etc.*) Is a hamster a natural part of this ecosystem? (*No; it is a domesticated animal that people keep as a pet.*) How do you think Jeff ended up at the pond? (*He probably escaped from a house nearby.*)

p. 32–33: What does Cecil do to make the hawk let him go? (*He emits a terrible smell.*) Why do you think he has this ability? How does it help him? (*It is a form of self-defense; predators may not want to eat him if he smells bad.*)

Procedure Continued

p. 40: What is a food chain? (A series of relationships that show how organisms are related to one another by the foods each eats.) Explain that a predator is an animal that eats other animals, which are called prey. What does Jeremy mean when he says that he is “at the bottom of the food chain”? (He only eats plant matter and dirt, and other animals might eat him.) Sketch a simple food chain for Cecil’s pond using the information students have learned in the story so far.



p. 55: Explain to students that earthworms don’t really have stomachs. They have pointed heads to burrow through the soil, where they use their strong mouths to eat dead plants and dirt. Instead of stomachs, they have gizzards, which grind up the food. They do have intestines, which break the food down into chemicals that are absorbed into the worms’ bloodstreams. Leftover soil bits and undigested plant matter pass out of the worms as castings (worm poop). Worms are decomposers, which means they break down waste such as dead plants and animals so that living plants can use the nutrients; worm castings are very rich in nutrients. Worms are also good for the ecosystem because their burrowing makes space for air, water, and plant roots in the soil.

p. 102: Explain to students that often the relationships in an ecosystem are more complicated than a simple chain, so they can also look at the relationships between predators and prey as a food web. What does Jeremy mean when he says about the hawk, “. . . he realized we’re all connected in the ‘web of life’ . . . that our demise could also be his”? (The “web of life” refers to the food web or food chain. If the prey animals disappear, the hawk will have nothing to eat.)

p. 108: If students are unfamiliar with the concept of reincarnation, explain that it is a cultural belief in which a person or animal who dies can come back in a different body.

Ask students why they think Reggie the fly is standing on poop. (He eats poop.) Tell students that flies are decomposers, like worms, and they are important to the environment because they break down and eat waste such as dead plants and animals, as well as feces (poop), then they become food for predators such as toads and frogs.

Procedure Continued

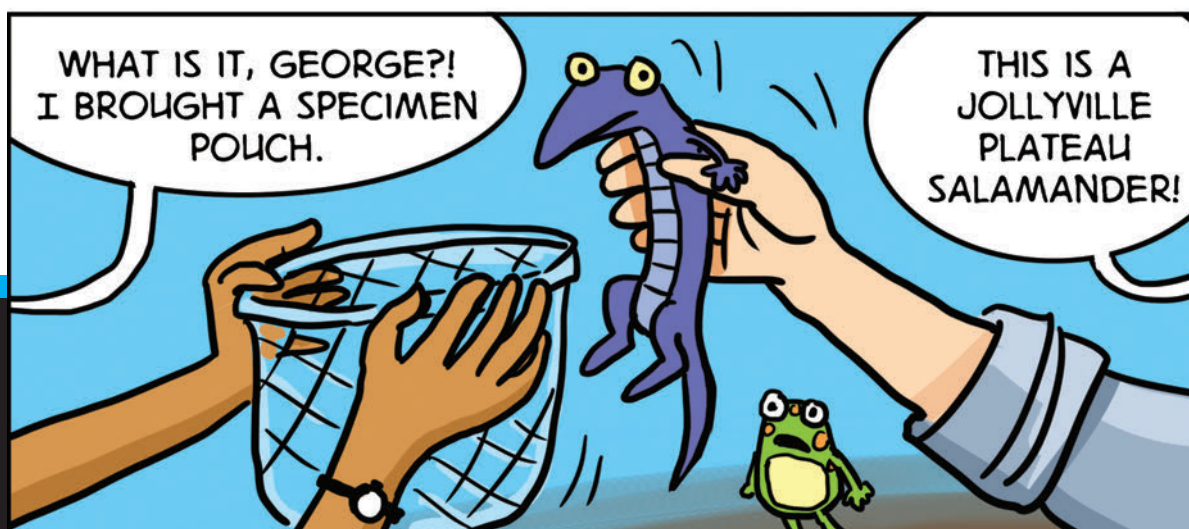
p. 114: Ask students if they know some of the differences between a lizard and a salamander. Show students the What's the Difference? mini poster and review the similarities and differences between lizards and salamanders, and between frogs and toads. Discuss with students how some of the differences between similar animals help them live in a particular places. For example, the smooth skin of salamanders and frogs helps them live in wet places, whereas lizards' scales and toads' bumpy, dry skin help them live in dryer environments.

p. 115: Explain to students that a habitat is the area where an animal lives. Each animal has specific habitat needs, such as food, water, soil, temperature, and shelter from predators.

Ask students what they think “protected habitat” means. (*An area where animals and plants are protected from human interference.*)

Explain to students that scientists often place radio transmitters on animals so they can follow the animals' movements and study how they live. This does not hurt the animals. Once a radio transmitter is placed on an animal, it begins sending out a signal. If the scientists are close enough to the animal, they can pick up the signal with a radio antenna and follow it. Rayray seems a bit confused about what is attached to his tail. Can you spot his mistake? (*He says that he has a **radio receiver** on his tail, but it is really a **radio transmitter**. It is sending out a signal that the scientists can follow.*)

p. 117: Ask students if they know what endangered species are. (*An endangered species is a type of plant or animal that has so few individuals left that the species is at serious risk of dying out or becoming extinct.*) Tell students that the Jollyville Plateau salamander is a real species that lives underwater in streams and springs in parts of Texas. It is in danger because the water it lives in is being polluted by nearby human development.



After Reading

6. Discuss the ending of the story by asking students the following open-ended questions:
What might have happened to each of the animals if the road had gone through the pond? (e.g., Rayray and Cecil might have died from lack of water; Reggie, Jeremy, and the hawk might have been able to move to other areas, etc.)

Besides bulldozing a road, what are some other ways humans might impact an ecosystem? (e.g., polluting the air and/or water; damming or using up the water; accidentally starting fires; chopping down trees; etc.)



7. Distribute copies of the Pond Inhabitants worksheet to students. Together as a class, or in small groups, have students search the book for text evidence to fill in the chart. Not all of the information is presented in the story; students should fill in only what they find.
8. Have students work in pairs or small groups to research and fill in the missing information on their Pond Inhabitants worksheets. Students can start with the information on pages 124 and 125, which provide some information about toads and earthworms. The website [BioKIDS Kids' Inquiry of Diverse Species](http://www.biokids.umich.edu/critters/BioKIDS%20Kids%20Inquiry%20of%20Diverse%20Species) from the University of Michigan is a great resource that will help students complete their charts.
American toad: http://www.biokids.umich.edu/critters/Anaxyrus_americanus/
Fly: <http://www.biokids.umich.edu/critters/Diptera/>
Earthworm: <http://www.biokids.umich.edu/critters/Oligochaeta/>
Red-tailed hawk: http://www.biokids.umich.edu/critters/Buteo_jamaicensis/
Jollyville Plateau salamander: <http://austintexas.gov/content/1361/FAQ/4646>
9. Using the information students entered into their charts, have the class work together to create a food web for Cecil's pond.

Use the following rubric to assess each student's learning as shown in his or her poster. If you will be using this rubric to assess students, be sure to share it with them at the beginning of the assignment so they will understand what is expected.

Criteria	3 Points	2 Points	1 Points	0 Points
Poster includes pictures and text information about animals from the story.	Includes pictures and text information about all 5 animals.	Includes pictures and text information about 3–5 animals.	Includes pictures and text information about 1–2 animals.	Includes no pictures or text information about animals.
Poster shows food web relationships.	Shows all food web relationships.	Shows some food web relationships.	Shows few food web relationships.	Shows no relationships.
Poster shows other elements of ecosystem (water, plants, etc.).	Shows all other elements of ecosystem.	Shows some other elements of ecosystem.	Shows few other elements of ecosystem.	Shows no other elements of the ecosystem.
Illustrations and text are readable and communicate information clearly.	Poster is well designed and communicates clearly.	Poster is legible and communicates clearly.	Poster is mostly legible and communicates some information.	Poster is illegible and/or does not communicate information.

Differentiation and Extended Learning Activities

Informational Comics

- ✱ Have students reference the informational “About” comics on pages 124 and 125 as models and create their own comics to share information about the other creatures in the story. Alternatively, have students write comics about a different possible threat to the pond or to a different ecosystem.

Food Web Tag

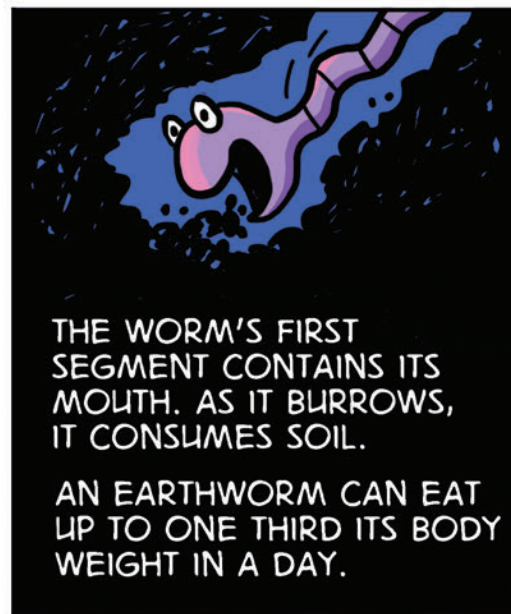
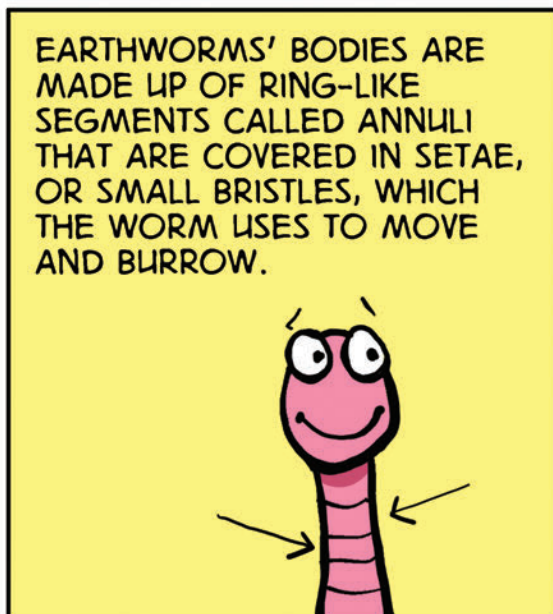
- ✱ Assign one student to be a hawk; two students to be frogs and two to be toads; and the rest of the students to be flies and earthworms. In a large, open area, let students try to tag, or “eat,” their “prey.” As each student is “eaten,” he or she becomes the animal that ate him or her. For example, if a hawk tags a frog, the frog then becomes a hawk and tries to tag and “eat” frogs and toads. If an earthworm is tagged by a toad, the earthworm becomes a toad and tries to eat the remaining earthworms and flies while avoiding the hawks. For an added twist, let the flies and earthworms tag the other animals to “decompose” them!

Observe a Local Ecosystem


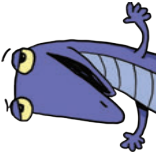



- * If possible, have students observe and study an ecosystem on or near campus. Use stakes and string or hula-hoops to mark out a small area for study. Provide students with magnifying glasses, notebooks or clipboards, and, if applicable, small shovels for turning over soil, and have them observe and take notes on all the living and nonliving things they find.

Keep a Habitat Journal

- * For a week or so, have students keep journals and record how all of their needs (food, water, shelter, etc.) are met in their habitats. Then, challenge them to use this information to design a human habitat in which people could live on the moon.

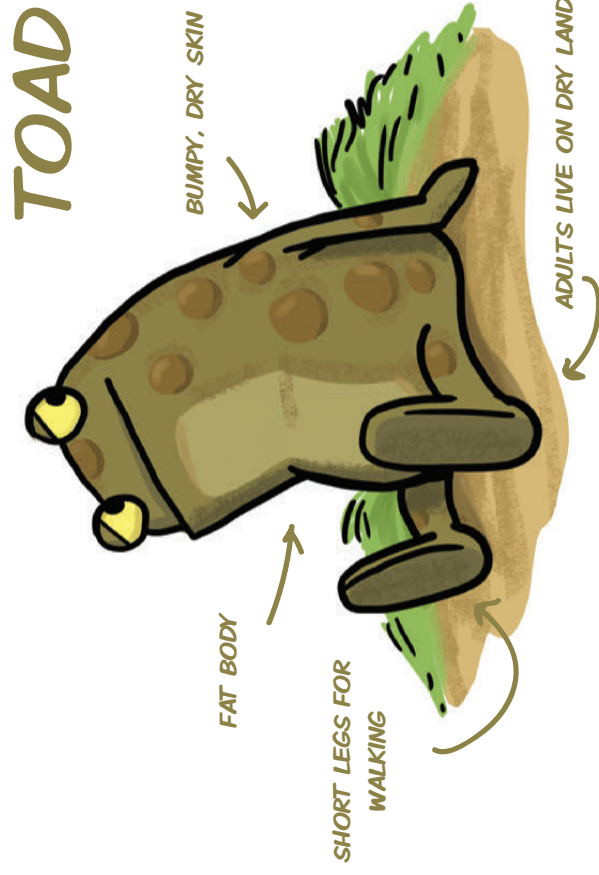


Pond Inhabitants

Character	Species	What does the animal eat?	What eats the animal?	What are the animal's habitat needs? (Plants, water, soil, shelter, etc.)	What role does the animal have in its ecosystem?
Cecil 	American Toad				
Rayray 	Lizard Jollyville Plateau salamander				
Jeremy 	Earthworm				
Reggie 	Fly				
Mr. Hawk 	Red-tailed hawk				

WHAT'S THE DIFFERENCE?

FROGS AND TOADS ARE BOTH COLD-BLOODED AMPHIBIANS THAT LAY EGGS IN WATER AND GO THROUGH THE TADPOLE STAGE.



LIZARDS AND SALAMANDERS BOTH HAVE LONG BODIES WITH TAPERING TAILS AND TWO PAIRS OF LEGS.

