Web of Life in a Cave

Post-visit activity connecting to Cave and Canopy Climber

Grade level: 2nd grade NGSS 2LS4-1; CCSS W.2.7, W.2.8, MP.2, MP.4 **3rd grade** NGSS 3-LS4-3; CCSS RI.3.1, RI.3.2, RI.3.3, W.3.2, SL.3.4, MP.2, MP.4, **5th grade** NGSS 5-LS2-1, 5-PS1-1, 5-ESS2-1; CCSS RI.5.7, SL.5.5, MP.2, MP.4

Concepts: food chains of caves

Materials needed:

Book "Home in the Cave by Janet Halfman or another book that is about cave life

Procedure:

1. Have students read the cave life book you have selected.
2. Have teams of students research the following to determine the food web that exists in a cave: cave centipedes, cave spiders, cave salamanders, millipedes, amphipods, guano, and fungus. The students should use various sources for their research. The class may want to divide this list so that not everyone is researching the same cave life-form.
3. Once the teams have completed the research, have them make food chains. This may be done on chart paper, graphic organizers, computer or iPad.
4. Have the students determine producers, consumers, and decomposers.
5. Discuss with the students some of the following scenarios.
   a. A drought or wildfire on the surface kills most vegetation surrounding the cave. Little or no plant material blows or is washed in through the cave entrance.
   b. A raccoon takes up temporary residence in the cave and eats all the crayfish in the cave's tiny pool.
   c. Human visitors leave behind trash such as paper and batteries.
   d. There is heavy rain resulting in flooding of the cave.
   e. Humans have been drilling close by and caused cracks in the cave walls.
   f. Heavy use of chemicals on nearby farmland causes pollution in the groundwater which kills the shrimp and crayfish.

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What's Happening:

One way for food to get into a cave is through natural weather events like a flood. Excess rainwater washes leaves, twigs and plants into a cave, providing munchies for insects and other animals. Another way that nutrients enter a cave is simply when animals such as trogloxenes and troglophiles bring it in.

Yet another food source for cave organisms is one you probably haven't thought about -- guano. **Guano** is full of organic matter, and troglobites love to feed on this stuff. What is guano? It's the scientific term for bat droppings. Bats nest deep inside the cave, and their droppings will pile up several feet high and several feet wide. Very few animals can feed directly on these droppings, but bacteria and fungi found in the cave can decompose guano into basic food and nutrients.

As you can see, all the different organisms in a cave depend on each other for survival. We call this a food chain and here's how it works, starting at the bottom:

Organic material, such as guano, other animal droppings and washed-in plants provide a haven for fungus and microscopic bacteria, which feed on the organic material, breaking it down into simple nutrients. Then, millipedes and tiny crustaceans feed on the fungus, bacteria and the nutrients left behind. Bigger insects, such as cave beetles, feed on these millipedes, crustaceans and even the eggs of cave crickets. Centipedes, cave spiders, salamanders and cavefish feed on insects smaller than them. Some cave centipedes grow so large, they've been spotted feasting on bats. Because there are more animals and organisms at the bottom of the cave food chain than at the top, it might be better to call it the cave food pyramid. You'll find many decomposers at the base of the pyramid, with the more evolved carnivores at the top. **How Cave Biology Works by** Debra Ronca.

Book List:

1. Secrets of Sky Caves by Sandra Athans
2. Caves and Caverns by Gail Gibbons
3. Secret of Abbott's Cave by Mark Dubowski
4. Caves by Stephen Cramer

Extension Activities:

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1. Pretend that you are a reporter for the evening news. You have been asked to defend the protection of caves in your area from drilling. Write the transcript for the program.
2. Research the location of caves in Arkansas.
3. Encourage the cave lovers in your class to learn about the three different types of animals that live in or visit caves. Keep a running chart of the three types. As you continue to explore cave Web sites and other sources, decide whether each animal you discover is a trogloxene, a troglophile, or a troglobyte. Once you have your chart of cave-dwelling animals, work as a class on a set of animal cards or PowerPoint slides about each animal. Each slide should include name of animal, type of cave dweller, description, size, diet, and habitat.

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