

For Creative Minds

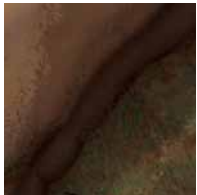
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Life in Cave Zones

Caves come in all different shapes, depths, sizes, and lengths. But they are all dark holes or tunnels in rocks or, in some cases, soil.

A cave's entrance can be very small or it can be big enough for humans and other large animals to walk easily in and out. Some entrances are narrow cracks in rocks that go into the rock or down into the ground. Depending on the size of the cave, there can be more than one entrance.

Natural sunlight in the cave's **entrance zone** lets some plants grow.



Going deeper into the cave, the **twilight zone** is where the sunlight turns into darkness. It is named after twilight—the time of day when sunlight turns to darkness. Animals that live in cave entrances and twilight zones travel out of the cave for food. So do bats and packrats, which live in either twilight or dark zones.

The **dark zone** receives no sunlight at all. Animals that live in the dark zone have special adaptations to help them move around without any light. They might not even have eyes because there isn't any light to see. They may have long antennae to feel their way. Food is carried to them by underground water, wind, or in the bat guano (poop).



What lives in which cave zone? There are two answers for each zone. Answers are upside down, below.



cave cricket



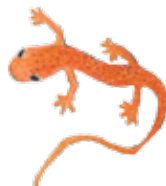
bird



blind salamander



cavefish



cave salamander



fern (plant)

salamander

Answers: entrance—bird, fern (plant); twilight—cave cricket (brown), cave salamander, blind cavefish, blind salamander

Rock Formations

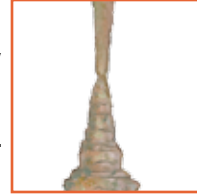
Some of the most beautiful and interesting features of caves are rock formations that either hang down from the cave ceiling or grow up from the cave floor. Smaller stalactites and stalagmites take hundreds to thousands of years to grow, while really large formations take hundreds of thousands of years.



Stalactites hang “tight” from the cave’s ceiling.



Stalagmites grow “mightily” from the cave floor up.



When stalagmites and stalactites grow together, they form a column.

Cave Habitats

A habitat is where something lives—where it can meet all of its basic needs. Living things interact with each other and the non-living things in that same habitat. There are many different types of habitats all over the world. Deep caves open into another habitat, like a desert, forest, or even ocean. Some animals move in and out of more than one habitat daily or seasonally.

Living things rely on non-living things in their habitat: rocks or soil, water, air, and climate. Plants need sunlight, water, nutrients in which to grow, and a way for seeds to move (disperse).

Animals need food, water, oxygen to breathe, and a safe space for shelter and to give birth to their young.

1 Are these things living or non-living?



stalagmites



stalactites



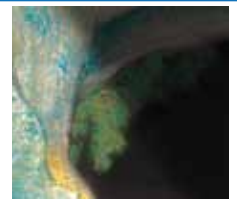
rocky walls



water



darkness



light

2 Why can't plants grow in cave dark zones?

3 How do most animals that live in cave entrance or twilight zones get their food?

4 How do animals that live in the dark zone get their food?

Answers or possible answers: 1) They are all non-living. 2) Plants need sunlight to grow and there is no light in the dark zones. 3) They go out of the cave to get food. 4) They rely on the droppings of animals that eat outside the cave, the bodies of dead animals, and food carried into the cave by water and wind.

Hands On: Bat Echolocation

Imagine having to find your way around in the dark every night—without any lights to help you see. Many animals rest during the day and are active at night (nocturnal). Animals that live deep in caves survive with no light at all. These animals have special body parts and senses to help them “see” in the dark. Some animals use the sense of touch (whiskers or antennae) to be able to move in the dark. Some have eyes that are very large to absorb as much light as they can—even in the darkness. Others use their sense of sound. Most bats use something called



echolocation to help them “see” in the dark. They locate objects (insects to catch or trees to avoid) by listening to echoes or sound waves bouncing back at them.

Bats make high-pitched noises with their noses or mouths. The noises are so high pitched that we can't hear them (like a dog whistle). These sounds bounce off objects around them and back to the bats—echoes. Bats have very large ears to help them trap

these echoes. Not only do the echoes tell bats where insects are, but their size! By “seeing” with these sounds, bats can catch insects in the air and can avoid flying into things.

To better understand sound waves, fill a large container or tub with water. Let the water settle so that it is very still. Now drop in a coin or small object. Watch the waves that travel out from the point where the object enters the water. Can you see the waves moving through the water? Sound makes waves too. Although we can't see sound waves with our eyes, we can hear them.



Do you think you could find an insect in the dark just by listening? Our sense of hearing is not as well developed as a bat's, but we still can sense location with hearing. Close your eyes and focus on the sounds around you. What do you hear? Can you tell where the sounds are coming from?

Bat and Bug

With three or more people, blindfold one person. That person is the “bat.” Other people are either trees or bugs.

Similar to the game “Marco Polo” often played in a pool, the bat is “it” and calls out “bat.”

The others must respond by saying “tree” or “bug.”

The bat has to try to catch a bug without running into a tree.

The bugs can move but trees cannot.

Take turns being the bat, tree, and bug.

Is it easy to find your way around by sound?

Would you rather “see” with your eyes or your ears?

Compare and Contrast: Bats, Birds, & Humans



Like humans, bats are mammals. But unlike us, bats can fly. In fact, they are the only mammals that fly. Most birds fly too.

There are almost 1,100 species (different types) of bats and around 10,000 species of birds. This story is about a gray myotis, an endangered species. Thousands of these female bats gather in certain caves to raise their pups. Some of the other types of bats that gather in large numbers in caves to raise their young include the Mexican free-tailed bat, cave myotis, lesser long-nosed bat, and the southeastern myotis. Go to the book's online activities to see photos.



Bat hands have five digits—just as we have five fingers. But bats have a thick skin covering their “fingers,” turning their “hands” into wings. Birds have three digits in their wings. Bats are born alive and drink milk from their mothers, just like human babies. Birds hatch from eggs.

Bats sleep during the day and are awake at night (nocturnal). Most birds and humans are awake during the day and sleep at night (diurnal). Bats sleep upside down in trees, caves, mines, under bridges, or even in bat houses. Most humans sleep in beds, and birds sleep in nests, trees, or bushes.



Most bats use echolocation and eyes to see. Humans and birds see only with their eyes.

Bats and humans have hair (fur is hair), and birds have feathers.

Bats and humans have teeth but birds have beaks.

Are Bats Good or Bad?

Sometimes movies or stories make bats sound scary, bad, or dangerous. After learning about bat behaviors, you decide . . . are bats good or bad?

Bats eat lots of crop-eating insects, saving millions of dollars around the world in pesticides.



Some farmers use bat guano as fertilizer for their fields.

Many fruit-eating bats spread plant seeds. If you enjoy eating bananas, pineapples, mangos, dates, and figs, you can thank a bat for spreading those seeds.



Some bats pollinate flowers and plants. In fact, some types of cactus and agave rely on specific bats for pollination. If something happens to those bats, the plants won't survive either. Next time you use an agave-based lotion for a sunburn, you can thank a bat!