

Gator Hole Graphics



Goal:

Interpret graphs that tell how some swamp animals survive drought.

Objectives:

Describe some of the ways drought affects animals in a swamp. Explain why alligators are an important part of the swamp community.

Grade Level: 6-7

Subject Areas:

science and math

Materials Needed:

- map of the United States
- pencils
- chalkboard or easel paper
- rulers
- graph paper
- copies of Gator Hole Graphics Questions and Graphs pages

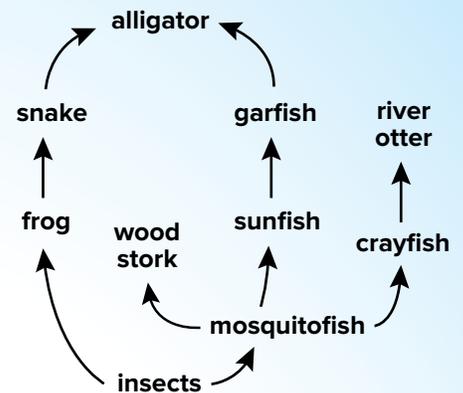
Water is probably the first word that comes to mind when you think about wetlands.

But in some swamps, water periodically becomes as hard to find as it is in some deserts. In this activity your kids can see how animals adapt to a seasonal lack of water in Florida's Big Cypress Swamp.

Tell the kids that they'll be learning about the Big Cypress Swamp. Begin by explaining that Big Cypress covers an area of about 2000 square miles (5200 km²) in southern Florida on the western edge of the Everglades. Have one of the kids point out the swamp on a map.

Next copy the simplified Swamp Food Web shown below on a chalkboard or piece of easel paper. As the kids look at the drawing, ask them to name some of the predators in the swamp (snakes, river otters, alligators). Then ask them to name some of the prey animals (insects, mosquitofish, frogs). Can they explain what the arrows mean? (The arrows point from an animal to the animal that eats it.) Point out that some animals, such as frogs and snakes, can be both predators and prey.

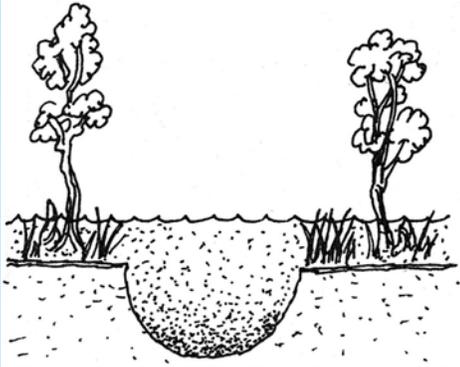
Next tell the kids that in the late 1960s a scientist named Dr. Jim Kushlan decided to study how the changing seasons in Big Cypress affect the animals that live there. Listed below are the things he observed. (You may want to list the major points on a chalkboard or large piece of easel paper to help the kids follow along. Also copy the diagrams in the margin so the kids can get a better understanding of what's happening.)



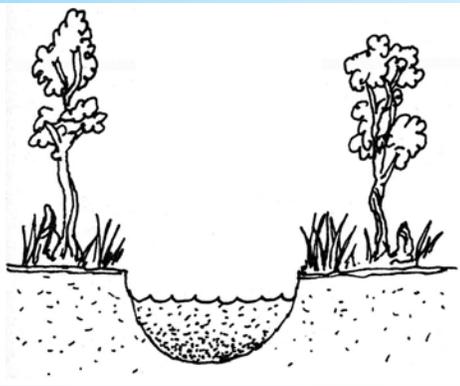
Swamp Food Web

- There is usually a six-month period each year when the average monthly rainfall is very low. During this dry season the shallow sheet of water that usually covers the swamp disappears, leaving only isolated ponds and a few large bodies of water.
- Many species of fish, birds, reptiles, and mammals rely on the larger and deeper bodies of water, such as lakes and canals, to survive the dry season.
- Ponds scattered throughout the swamp also attract large numbers of wildlife. These ponds are called alligator ponds, or "gator holes," because each is usually occupied by an adult female alligator. Many of these ponds are created when an alligator digs a den in the swamp ground. And in times of severe drought, when even the water in the gator holes has dried up, alligators sometimes dig deeper into the ground to reach the water below the surface.
- Gator holes have few water plants growing in them. By dragging their heavy bodies through the ponds, gators enlarge the ponds and keep water vegetation from growing.

Gator Hole Graphics



Wet season water level



Dry season water level

- Gator holes are great habitats for fish. And the fish provide food for wading birds, reptiles, and mammals.

Point out to the kids that alligators don't purposefully create and maintain gator holes to keep other animals alive. But due to their normal habits, they create this open-water habitat that helps other kinds of animals survive the dry season.

When his study was completed, Dr. Kushlan wrote a paper explaining what he had learned. His paper included graphs that illustrated his data and a summary of what he concluded from his research.

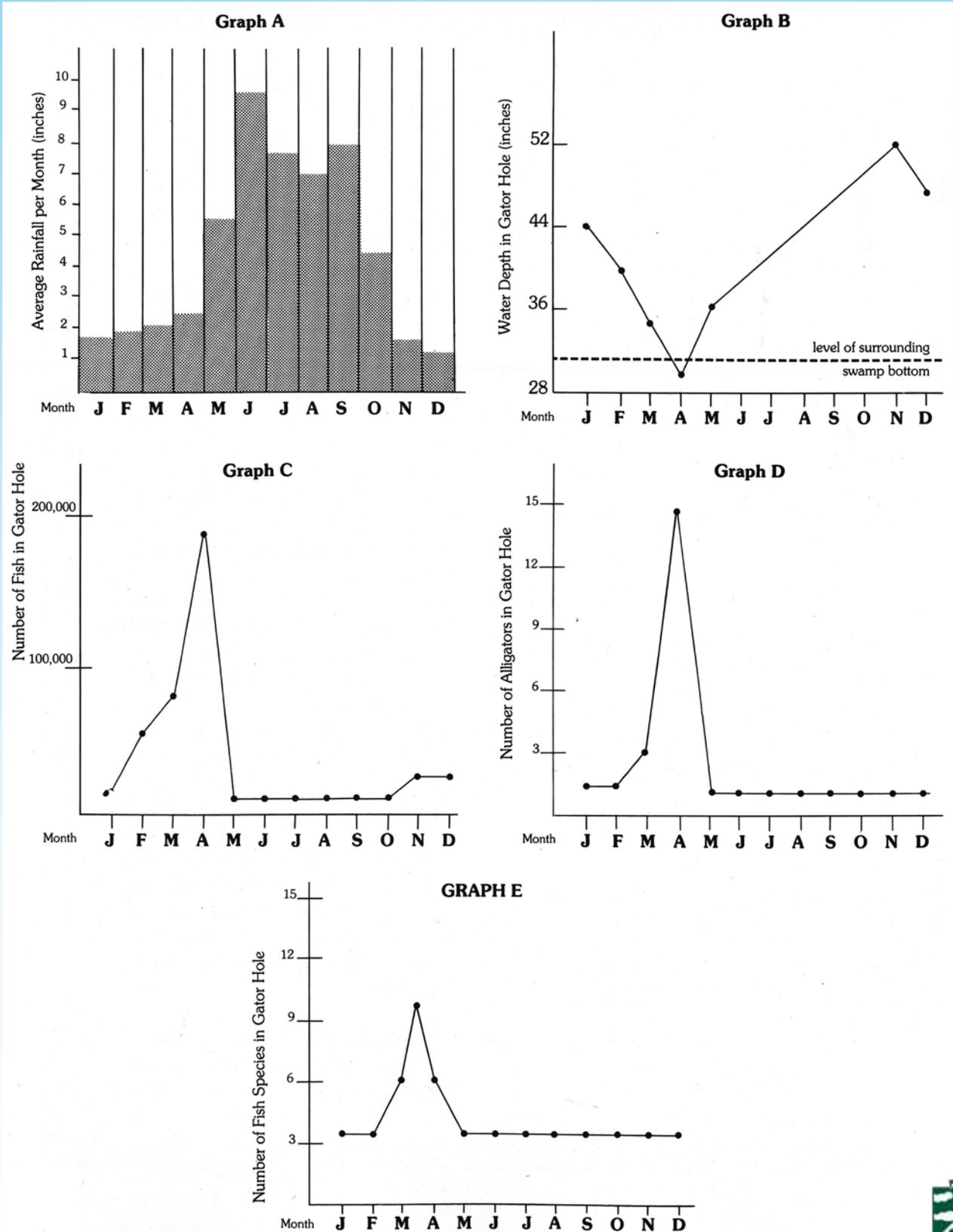
Now pass out copies of the Graphs page. Tell the kids the graphs on the page represent part of his data. Then pass out copies of the Gator Hole Graphics Questions. Have the kids study the graphs, then answer the questions. After they've finished, discuss the answers.

Note: The graphs and data in this activity were adapted from the actual study conducted by Dr. James A. Kushlan in Big Cypress Swamp.

Gator Hole Graphics



Gator Hole Graphics Graphs



Gator Hole Graphics



Gator Hole Graphics Questions

1. According to Graph A, which month had the highest average rainfall? Which month had the least rainfall? In which months does the dry season occur?
2. According to Graph B, during which month did the water in the gator hole become lower than the surrounding ground?
3. According to Graph C, in which month was the number of fish in the gator hole highest?
4. According to Graphs A and E, did the greatest number of fish species occur in the gator hole during the wet season or the dry season?
5. Between which two months did the fish population decrease the most?
 - a. April-May
 - b. July-August
 - c. January-February
6. True or false: According to Graphs Band D, the greatest number of alligators lived in the gator hole when the water depth reached 50 inches.
7. According to Graphs Band C, the fish population in the gator hole reached a peak when the water depth in the pond was at
 - a. 52 inches
 - b. 36 inches
 - c. 30 inches
8. Raccoons, river otters, and many kinds of wading birds eat fish. Would you expect the numbers of these animals around the gator hole to increase or decrease during the dry season?
9. The wood stork, a fish-eating bird that lives in Big Cypress Swamp, will not lay eggs in years with very heavy rainfall. Why might this happen? Use the following information to form your answer.
 - Wood storks nest high above the ground in the branches of bald cypress trees.
 - Wood storks do not catch fish by looking for them—they feel for them. With their long beaks halfway open, the birds grope in the water for fish. When they touch their prey, their beaks instantly snap shut.
 - To feed their young, the parents take turns flying to ponds, where they catch and swallow a large amount of fish. Then the adult flies back and regurgitates the partly digested fish into the nest for the young to eat. Until the babies are old enough to defend themselves, one parent always remains at the nest.
10. If the least rain fell in December, why was the level of water in the gator hole lowest in April?

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Gator Hole Graphics Answers

1. June; December; November through April
2. April. Tell the kids that at this point the land around the gator hole has dried up and it has become an isolated source of water. Refer them back to the two diagrams you copied earlier.
3. April
4. During the dry season, between the months of March and April. Point out that these additional species came from the surrounding swamp waters that dried up as the dry season continued. Explain that many fish and other animals died during the drought. But enough individuals managed to follow the receding waters into the gator hole.
5. a
6. False. The greatest number of alligators occupied the gator hole in April, when the water level was at its lowest mark—30 inches. Explain that the total number of alligators in the swamp doesn't change much from wet season to dry season, but the distribution of alligators throughout the swamp does. During the wet season, young alligators and adult males usually wander throughout the swamp. (Only adult females live in gator holes year round.) But as the swamp dries up, the “wanderers” head for remaining water. Resident females will sometimes tolerate young alligators at their ponds, although the females have been observed eating a few “visitors.” Males and some of the youngsters gather at larger bodies of water, such as lakes and canals.
7. c
8. Increase. All these animals flock to gator holes to eat fish. This predation actually helps a greater number of fish survive. If none of the fish were eaten by predators, most would die from lack of oxygen. This way, some fish are eaten, but the remaining fish have enough oxygen to last until the rains return.
9. In years with heavy rainfall, isolated ponds crowded with fish do not form. Because of their unique fishing technique, wood storks have a harder time catching fish that are not packed together. Under these conditions, it would take more time and energy for parents fishing one at a time to catch enough fish to feed their young. Rather than attempting to raise young that may not survive, wood storks do not breed at all during very wet years.
10. The pond was filled by the heavy rains that fell from May through October. After several months of very little rain, the water in the pond had evaporated down to April's low level.