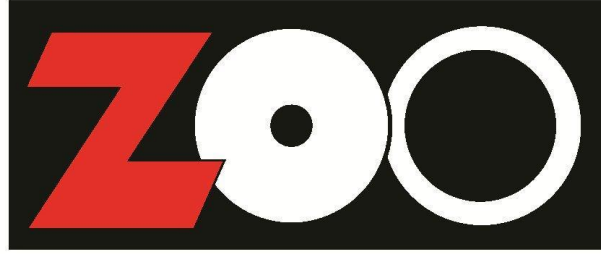


THE JACKSON



Zoo Connections Curriculum

A Change Will Do You Good:
The diversity and change of organisms over
time

4th grade

Curriculum is aligned with the Mississippi Academic Framework. Lessons and support material are provided in the following areas:

Life Science – 3a; Language Arts – 3d, 3e;
Mathematics – 1c, 1h, 1i, 2d;
Social Studies – 1d.

Pre-Visit

Vocabulary Words

Habitat
Species
Extinct

Adaptation
Recycle
Range

Campaign
Fossil

Concepts

- In order to survive in their habitats, animals have adaptations.
- Adaptations serve different functions of the animal's survival in its habitat; therefore an animal can only survive in a habitat to which it is adapted.
- Animals need to adapt to changing conditions or they may become extinct.

Activities

Vocabulary Words

Introduce the vocabulary words to your class. Review their meaning together. Pass out the **Animal Awareness Word Jumble** for them to complete in class or at home.

Adaptations

Review the definition of adaptation. Discuss with your students that they have adaptations too! Play a game to demonstrate how important our opposable thumbs are. Using masking tape or string, secure the student's thumbs to the palms of their hands, making them unmovable. Ask them to do several tasks such as tying/untying their shoes, writing their names, or any other activity that would usually involve using thumbs. Once everyone has their thumbs back, use pictures to help the students identify the adaptations animals have. Ask them to think about where the animals live and some things that would help them survive in their environment. Start with some obvious adaptations and work up to some that might be more difficult to spot.

Fossil Pictures

Have your students look at fossils of extinct animals. These fossils can be real or pictures from magazines, books, or the internet. Have them write down the adaptations they see; then compare/contrast those to animals that are alive today. See if your students can find adaptations or lack of adaptations that may be responsible for the animal's extinction.

Adaptation in Action

Give the students each a piece of paper and have them make a paper airplane. Have them all fly their airplanes. The plane that was determined to be the "best," have the student who made it instruct others on how to make it. Once all the students have made it, fly the planes again. Ask the students if they all flew the exact same and justify their answers. Make the "best" airplane from this round and re-fly them and discuss the results again. Create a discussion about how small changes can create big differences. This can be seen in the way animals adapt to their surroundings. Animals make little changes over time to help them survive better in their habitat. Over long periods of time, these changes can lead to really big differences among species.



Animal Awareness Word Jumble

Use the clues to figure out what the jumbled words spell. Use the numbered letters to figure out the secret message.

1. tpanoatdia _____
 11 & 18 3 21 13 Something an animal has or does to help it survive in the wild.

2. psseeci _____
 15 6 A group of living things that share common features and are called by a common name.

3. cigpanam _____
 22 8 14 10 A planned activity that helps to create awareness.

4. ibathat _____
 5 23 19 Any area that an animal makes its home; containing food, water, shelter and space.

5. rgena _____
 12 20 9 The area where a type of living thing lives in the world.

7. textnic _____
 4 When all members of a plant or animal are no longer alive.

8. ccyrele _____
 16 2 7 17 Taking trash and finding a way to reuse it.

9. ifsosl _____
 25 1 24 The remains of plants or animals that have died.

 1 2 3 4 5 6 7 8

 9 10 11 12 13 14 15 16 17 18

 19 20 21 22 23 24 25



At the Zoo

Remind your students about what they have learned about adaptations and endangered species. Have your students work in groups at the zoo to complete the **Endangered Species Scavenger Hunt** Activity Sheet. Make enough copies for each group to have one. For ease, if you print it double sided the students will only have one piece of paper to keep track of. Let your students help you teach. Ask them questions that help them discover the information they want to learn. Remind them to read signs and ask any zoo staff member or volunteer any questions that they have!

*While every animal is not listed on the Zoo Activity Sheet, we encourage you to visit all of the exhibits.

Some adaptations of the animals on the activity sheet are listed below to help you to guide the students to the answers. The students may surprise you and come up with even more!

Sumatran Tiger

The tiger has a pattern for camouflage in its natural environment which is often tall grass. Being the smallest of the tiger species, it is easier for the Sumatran tiger to move through the jungle. The white spots on the back of tiger's ears are called "eye spots" or "predator spots". These spots are believed to function as false eyes as well as to make it look larger to any predator approaching from behind. This is particularly helpful in keeping cubs safe.

White Rhinoceros

The white rhinoceros looks like an intimidating creature. Its powerful body and massive horns make it seem like a strong predator. But its most effective tool in catching its food is its wide mouth...rhinos are vegetarians and graze for their food. Their strong lips and wide rectangular mouths are perfect for plucking grass. They also make it a practice of covering themselves with mud to protect them from the hot sun. Their large ears can hear very well, which somewhat makes up for their poor vision.

Red Panda

The red panda is not a bear. In fact, the panda makes up its own family. It is a tree dweller and has sharp claws to help it climb. It has thick, dense fur to protect it from cold and rain. Sharp teeth allow it to eat bamboo, a prominent plant species in its habitat.

Chimpanzee

Chimpanzees are very social animals and will often touch, groom and "play" with other chimps in their community. They are fully loaded with muscles which make them strong and heavy. Because of the added muscle weight, they are too heavy to swim. Look around the chimp enclosure and you will see that it only takes a moat of water to keep them safe and secure in their zoo home. Like humans, they have an opposable thumb which they use to grab for tree branches, food and other items they may use.

American Alligator


The alligator is built perfectly to live and survive in the water. It has a powerful tail that it uses as a rudder when it swims and to knock prey down. Its eyes and nostrils are on the top of its head so that it can be almost completely submerged under water and still be able to see and breathe. The alligator has hard scales on its back called scutes that act like a suit of armor for protection. Most notable is the alligator's strong mouth; with over 80 teeth and about 2,125 pounds of force! (That is about the weight of a small pick-up truck)

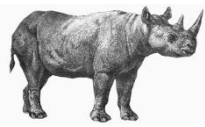



Endangered Species Scavenger Hunt


Some animals are endangered and face extinction because their habitat is changing faster than they can keep up with. Observe some of the endangered species at the zoo and fill in the chart below.

1. Draw 3 adaptations you see on the animal that help it survive in the wild.
2. Write down the habitat the animal lives in.
3. Write down the food the animal eats.
4. Write down the range of where the animal lives.
5. Write down some interesting facts about the animal.

Animal	Adaptation	Adaptation	Adaptation
Sumatran Tiger 			
Habitat	Food	Range	Interesting Facts

Animal	Adaptation	Adaptation	Adaptation
White Rhinoceros 			
Habitat	Food	Range	Interesting Facts

Animal	Adaptation	Adaptation	Adaptation
Chimpanzee 			
Habitat	Food	Range	Interesting Facts

Animal	Adaptation	Adaptation	Adaptation
Red Panda 			
Habitat	Food	Range	Interesting Facts



The Amazing Alligator

(Behind building J on your Zoo map)

Alligators have been around since the time of dinosaurs. View our alligators at the zoo and identify the adaptations you think have helped them survive for millions of years.

Note: Our alligators may be hard to find, look in the reeds close to the shoreline.

Adaptation	How has it helped them survive?

Post-Visit

Vocabulary

Pass out the **Endangered Animals Crossword Puzzle** for the students to complete as the review for what they have learned about the vocabulary words

Crocodilian Comparison

Pass out the **Crocodilian Comparison** activity sheet and have the students complete it in class or at home.

Recycling Activity

Use the facts below to develop math problems about the benefits of recycling and conservation. Have the students use their addition, subtraction, multiplication, and division skills.

- A dripping faucet (1 drip per second) creates 86,400 drips per day. That is 5 gallons of water a day.
 - Example Question: The Mississippi River is a good source of water for animals; if everybody's faucet dripped in your class, how long would it take to empty this river?
- Paper comes from trees and on average 1 American uses 7 trees per year.
 - Example Question: Have the students count the trees on their school yard or in a different designated place; ask them to calculate how long it would take them to use up those trees.
- By recycling 1 ton of paper, you can save 17 mature trees and reduce 3 cubic yards of landfill space.
 - Example Question: How many mature trees fit into 15 cubic yards in a landfill?

Narrative Project

Pass back the **Endangered Species Scavenger Hunt** activity sheets and have the students work independently or in small groups to create a campaign to help save one of the endangered species they saw at the zoo. Their campaign materials should include 1 research paper with facts about their animal and their plans to save it. They should also create a visually stimulating poster that inspires and teaches others about how to save that animal.

Resources

Animal Collection: <http://jacksonzoo.org/>

- Information about some of Jackson Zoo's endangered species.

Animal Bytes; Conservation Status: <http://www.sandiegozoo.org/animalbytes/a-status.html>

- An explanation of what endangered and other conservation statuses mean and how it is determined.

Panda Challenge: <http://nationalzoo.si.edu/Education/ConservationCentral/default.cfm>

- An interactive game where students explore animal habitats and discover ways people help protect animals.

Conservation Snapshots: <http://aza.org/conservation-snapshots/>

- A description of the different types of animal groups and some problems each group is facing in the wild.

World Wildlife Website: www.wwf.org

- This website provides information about endangered animal species, current research projects and conservation techniques that occur around the world.

Recommended Zoo Programs

Are you looking for another way to bring the lessons in this curriculum to life? We've got just the thing; when you're at the zoo stop by the Gertrude C. Ford Education building for a fun educational program that supports this material or have the Jackson Zoo come to you!

At the Zoo

Wild Classroom:

Curious Creatures- Why don't snakes have fur? How come an ostrich has feathers but doesn't fly? During this exploration of animals, you'll compare and contrast, discover differences within the animal kingdom, and come away knowing more about why animals look and act the way do.

Animal Program:

Mississippi Wilds- Have you ever wondered what might be living in your back yard? Here in Mississippi it could be anything from otters to owls! Discover how these native animals are surviving during this look into their lives.

Let us Visit You

Zoo Mobile:

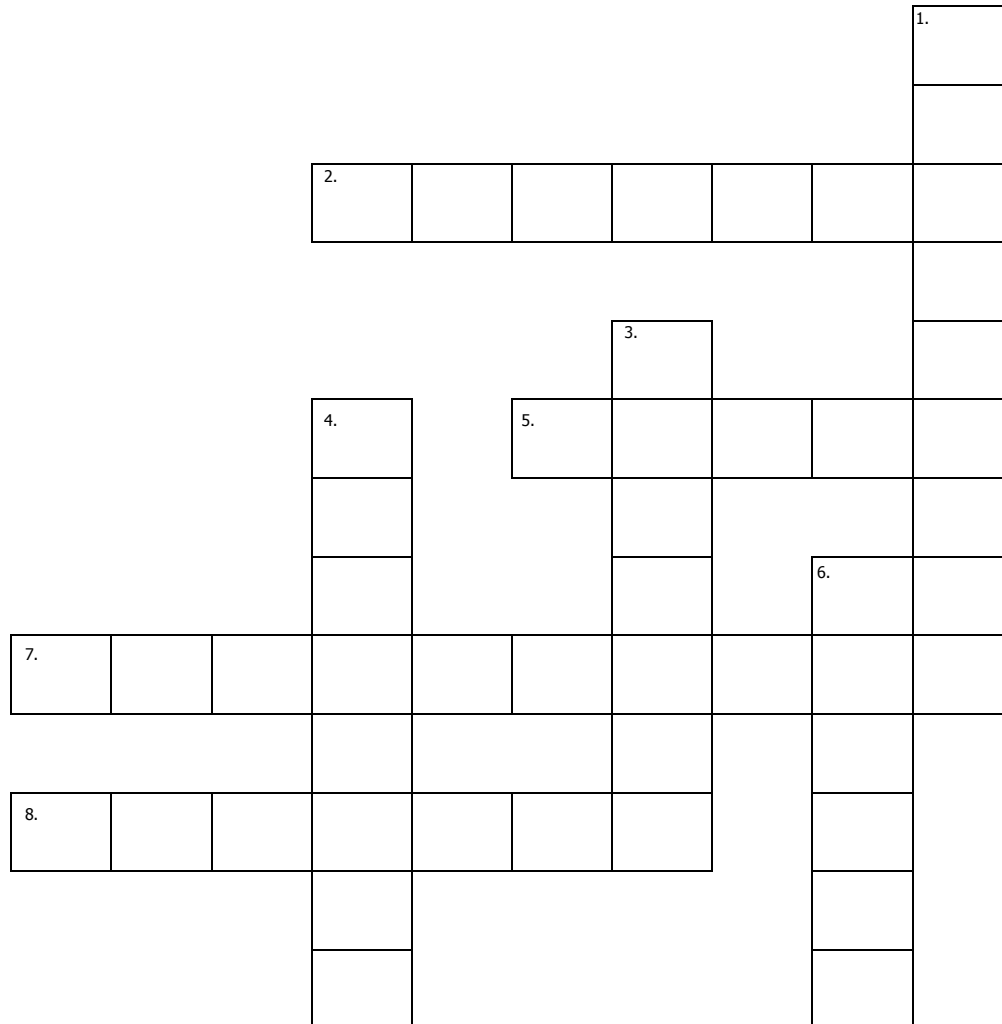
Habitat Sweet Habitat- What does it take to survive? For starters, a good home always helps. It's all about the habitat; animals have different physical and behavioral adaptations to thrive where they live. Let's discover a few of them!

For information on how to schedule any of these programs for your class, visit our website at www.jacksonzoo.org or call 601-352-2580 ext 240. All of these programs must be scheduled at least two weeks in advance.



Endangered Animals Crossword Puzzle

Complete the crossword puzzle by filling in the vocabulary words that match their definitions.



Across

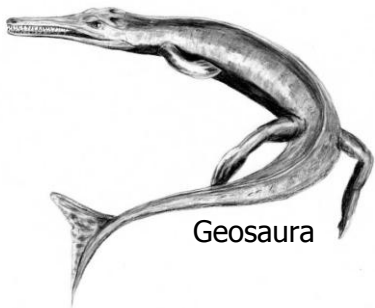
2. Taking unwanted items and finding ways to reuse them again.
5. The location where a living thing can be found.
7. Anything an animal has or does that helps it survive in the wild.
8. When an animal completely disappears for forever.

Down

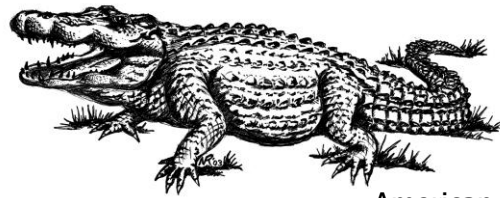
1. One type of living animal that is called by a common name.
3. An area that has everything an animal needs to survive.
4. Raising awareness about something.
6. The remains or impressions left of a dead animal or plant.

Crocodylian Comparison

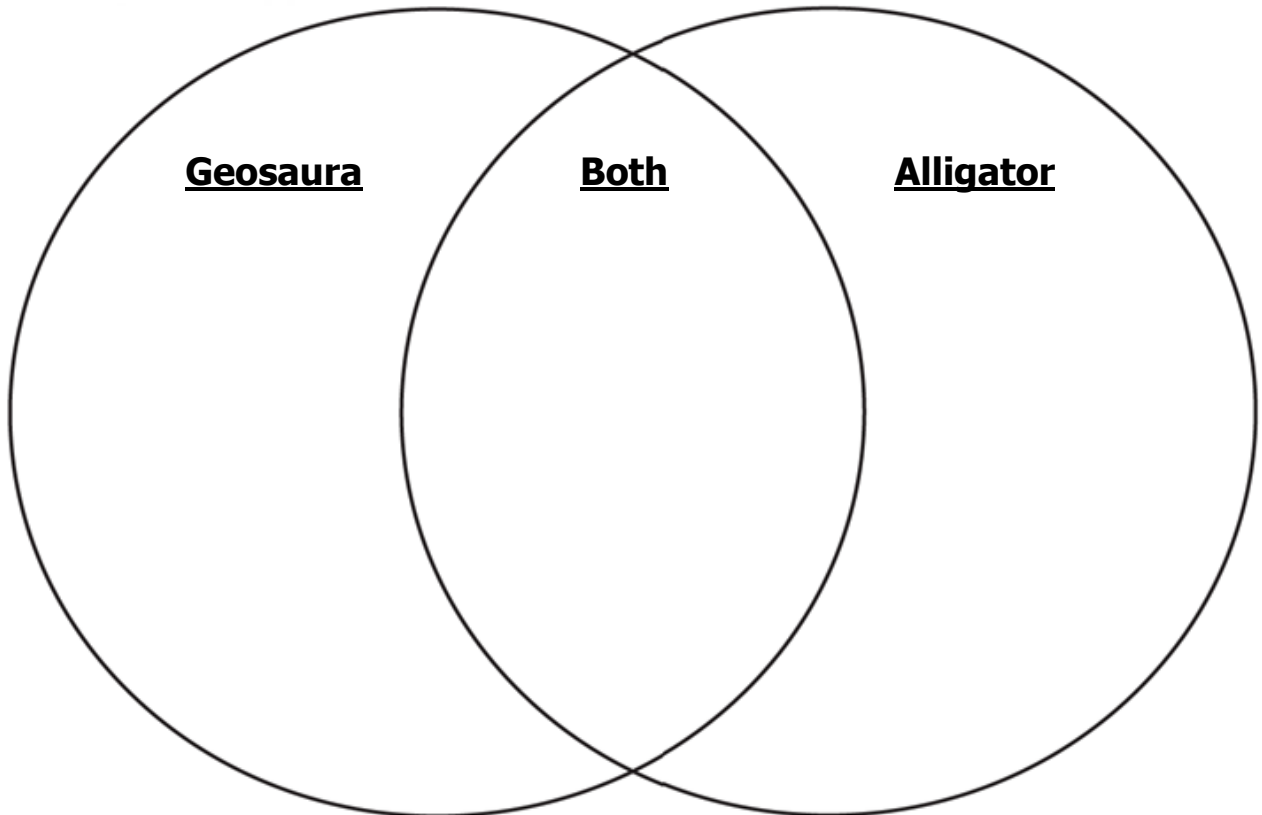
Alligators have been around for millions of years but many of their relatives have gone extinct. Below is an extinct species of crocodile called geosaura. It lived 155-175 million years ago during the mid to late Jurassic Period. It was 10 feet long and weighed 250 pounds. Using the diagram below, compare and contrast the adaptation of geosaura to the alligator you saw at the zoo.



Geosaura



American Alligator



Looking at these adaptations, why do you think the geosaura went extinct while the American alligator survived?