The African savanna conjures up images of one the most wild and beautiful places on Earth. Vast herds of antelope feeding on endless grasslands, rivers filled with hippos and crocodiles, and columns of wildebeest, silently walking head to tail along their traditional migration routes. This is the habitat of African cats.

What's a Habitat?
All animals, including humans, need a place to live where they can find food, water, cover, and a place to raise young in order to survive. Scientists call this an animal’s habitat. While we humans can live in a variety of habitats, animals generally have more specific requirements based on their unique physical and behavioral adaptations.

Food in a habitat can be as diverse as fungi and grasses to termites, gazelles, and trees. Water sources can be found in a variety of sizes such as waterholes, rivers, and even small drops of water on a leaf. Plants can not only be a great source of food but can also act as shade, cover, or a place for raising young or stalking prey. For instance, lion and cheetah require open spaces for hunting, a plentiful supply of prey, grasses and trees for shade and cover, and protected areas among rocks and shrubs to raise their young.

What's an Ecosystem?
Ecosystems are communities of plants, animals, and microorganisms within a particular area that interact with each other and with the environment. Ecosystems include all living and non-living components of an area. Ecosystems are complex, dynamic entities that use and transfer energy, produce waste, and recycle nutrients. Tropical rainforests, deserts, and corals reefs are just a few examples of the many ecosystems found around the world. All ecosystems, whether they are on land or in the ocean, are connected. So what occurs in one ecosystem affects the dynamics of another.

How does Energy Flow through the Savanna?
Most life on earth depends on energy from the sun. Plants are producers – they are able to use the sun’s energy to make their own food.

Unlike plants, animals cannot produce their own food and must eat other things for food. Anything that cannot produce its own food is called a consumer. Consumers that eat producers are called herbivores; consumers that eat other consumers are called carnivores; consumers that eat rotting or dead things are called detritivores. The relationship between producers and consumers can be documented through food chains and food webs.

A food chain is the way energy is transferred from producers to consumers. There are many food chains in a habitat because some animals consume more than one kind of animal, and some animals consume both plants and animals. A complex system of overlapping food chains in an ecosystem is called a food web. For example, zebra, wildebeest, and Thomson’s gazelle consume grasses and leaves from many different kinds of plants and in turn are consumed by many different predators, such as cheetahs, lions, and hyenas. When the hunters and scavengers have finished with a carcass, decomposers such as bacteria, fungi (an organism that is neither a plant nor an animal and gets its energy by breaking down other organisms), millipedes, cockroaches, and carrion beetles continue to feed off of the bones. These organisms help return nutrients back into the habitat. One example is that cheetahs eat gazelles, the dung from the gazelles adds nutrients to the soil, these nutrients help new grasses grow, providing more food for the gazelles, and thus food for the cheetah continuing the cycle. All living things depend upon something else for their survival. These animals are connected in an intricate food web.

One of the best ways to see how species are connected on the African savanna is through the use of food chains and a food web. Examples of these food chains include:

- Carrion → fungus → termites → lappet faced vulture
- Carrion → lappet faced vulture
- Sun → grasses → warthog → cheetah
- Sun → grasses → Thomson’s gazelle → olive baboon → lion
- Sun → grasses → olive baboon → spotted hyena
- Sun → grasses → warthog → spotted hyena
- Sun → grasses → elephant
- Sun → grasses → zebra → lion
- Carrion → spotted hyena
- Elephant dung → dung beetle → kori bustard → lion
### The African Savanna: Home to Millions

The African savanna is an amazing and complex grassland ecosystem. It is characterized by warm temperatures year-round (64 degrees Fahrenheit and above) and seasonal rains. In Kenya where **AFRICAN CATS** was filmed, there are two rainy seasons that together produce from 20-50 inches of rain each year. The long rains last from March to May and the short rains from October to December. These seasonal rains, along with periodic fires and grazing, prevent trees from dominating the grasses and the savanna from becoming a forest.

Although these extremes in climate can be harsh, Africa’s grasslands teem with life. The grasslands support the greatest number and variety of large grazing animals in the world, thanks to a process known as the “grazing succession”. In this process, heavy grazers like elephants, buffalos, and hippos eat and trample the large coarse grasses, causing changes that make the plants tastier for lighter grazers like zebras and wildebeest. These in turn prepare the grasses for the lightest grazers like warthogs, which in turn prepare the grasses for the lightest grazers like zebras and wildebeest. These processes can result in a “race for survival” with species competing against each other for food, water, and space.

### Wildlife at Work: Every Animal has a “Job” on the Savanna

Just like your community, every living thing on the savanna plays an important role in shaping its environment. Elephants knock down trees, clear grasses, and dig watering holes that other animals depend on as well. Light grazers like warthogs trim grasses to help new plants grow. Dung beetles and fungi recycle animal waste, returning essential nutrients back into the soil. Scavengers like hyenas and vultures feed on carcasses. This helps clean up the savanna and prevents disease. Termit mounds serve as lookouts, scratching posts, and hiding spots for cheetah and other species.

The African savanna is ruled by top predators like lions, leopards, and cheetahs, who help maintain gazelle and antelope populations. In fact, the health of many prey populations depends on these and other predators. By feeding on the sick and the weak animals, lions and cheetahs inevitably ensure that the strongest will pass on their genes to future generations. It also keeps herd numbers from exceeding the amount of grass and forage available to them each year. In turn, the amount of available prey controls lion and cheetah populations. In the end, the savanna ecosystem is maintained in a delicate balance where every living thing depends upon another for survival.

### Habitat Components and Interactions

- **Carri on → fungus → termites → agama lizard → olive grass snake**
- **Fungus → termites → helmeted guinea fowl → cheetah**
- **Sun → acacia leaves → giraffe → lion**
- **Fruit → vervet monkey → olive baboon → lion**
- **Sun → grasses → Thomson’s gazelle → cheetah**
- **Sun → grasses → grasshopper → agama lizard → kori bustard → cheetah**

These food chains can also be assembled into a food **pyramid** to show how plants and animals are balanced on the savanna. Food pyramids show the energy transfer between different trophic levels in a habitat.

### Africa’s Savanna Ecosystem

The savannas of Kenya and Tanzania are perhaps best known as home to one of the greatest wildlife spectacles in the world – the annual wildebeest migration. During the rainy season, the savannas of the Serengeti plains are feeding grounds for a staggering number of animals: 1.3 million wildebeest, nearly 200,000 Burhell’s zebras, over a quarter of a million Thomson’s and Grant’s gazelles, as well ostriches, eland, and hartebeest. Predators and scavengers like lions, hyenas, and jackals follow the herds.

### Food Pyramids and Energy Transfer

The savannas of the Serengeti plains are feeding grounds for a staggering number of animals: 1.3 million wildebeest, nearly 200,000 Burhell’s zebras, over a quarter of a million Thomson’s and Grant’s gazelles, as well ostriches, eland, and hartebeest. Predators and scavengers like lions, hyenas, and jackals follow the herds.
WHAT’S IN A HABITAT?
Grade: 2–3 | Length of Activity: 1 hour | Subjects: Science | Staff: One teacher or volunteer

DESCRIPTION
Students will be introduced to the important components of a habitat – food, water, cover, and a place to raise young. They will first make a drawing of their own habitat before using picture clue cards to discuss the African savanna habitat. In completing these activities, students will learn that all animals, including people, need four basic things to survive: food, water, cover, and a place to raise their young. These four elements make up a habitat.

OBJECTIVES
Through participation in this activity students will:
• Understand the meaning of the term habitat.
• Determine what makes up the habitat requirements that all animals need to survive (food, water, cover, and a place to raise their young).
• Compare a person’s habitat to the savanna habitat.

POSITIVE ACTIONS TO HELP AFRICAN CATS
Learn more about the savanna habitat and the wildlife that lives there by reading books and visiting websites listed in this guide.

MATERIALS
• Worksheet 14: What does my habitat look like? – worksheet
• Worksheet 16: What makes up the savanna habitat? – people & food cards
• Worksheet 17: What makes up the savanna habitat? – water & cover cards
• Magnets or tape
• Chalkboard or white erase board

SET UP
• Make copies of worksheet 14 and distribute to students along with crayons or colored pencils.
• Make one copy each of worksheets 16 and 17. Cut out picture cards so there is one complete set of 12 picture cards.

Procedures
1. Open the discussion by asking students what they need to survive (i.e. food, water, cover). Discuss the difference between a “need” such as water and a “want” such as soda. Tell students that sometimes a habitat is even bigger than the physical building they identify as a home – for example, people may need to go to their garden or a grocery store to get food. Compile a list of the things students need before telling them that these components make up their habitat.
2. Have students draw a picture of their home on worksheet 14: What does my habitat look like? Make sure they include examples of food, water, and cover. Explain that their home is where they are growing up, so it is similar to a den site or nest that an animal might build to raise their young.
3. Review students’ pictures and hang them around the classroom if desired. The class will now be participating in an activity to discover what lions and cheetahs need on the savanna.
4. Write the following categories on the chalkboard: food, water, cover. Explain to students that they have a stack of picture cards with examples of each of these categories.
5. First hold up the examples of people. Ask students to use their knowledge of a human habitat to match each habitat requirement to its appropriate category.
   a. Hold up the food example and ask students “What is this picture of? That’s correct. This is a picture of food. We will put this in the food category.”
   b. Next, hold up the water example. Ask students “What is this picture of? Correct, this is water. Do we need water to survive? Absolutely. This goes into the water category.”
   c. Finally, hold up the home example. “What is this picture of? Yes, this is a picture of a home. People need homes for cover. This goes into the cover category.”
6. After reviewing what people need to survive have students bring their cards up, one at a time, to continue matching the remainder of the cards. Discuss what animals need to survive in the savanna habitat. Further the discussion by asking students to make connections between the cards in each category and the animals that might depend on it.
them. In addition to talking about how lions and cheetahs may use these items, also encourage students to think about smaller organisms as well – insects, worms, snakes, lizards, and even fungi and bacteria are all very important in a habitat.

Wrap-up
Once students have correctly placed all of the Food, Water, Cover cards, review their answers as a class. Use the following discussion points to guide your wrap-up:

- Discuss why each of these habitat requirements is important to an animal’s survival. Predict how changing or removing one of these (food, water, or cover) could affect living things in a habitat. Students’ answers will vary but they should conclude that removing one of these requirements can cause major changes to the habitat and the animals that depend on them.
- Create a chart to compare and contrast our needs to the needs of animals on the savanna. Discuss your findings. Students should draw conclusions between the fact that we both need food, water, cover, and a place to raise young. However, they should notice that our needs and the needs of African cats are often met in different ways.

All animals, including people, need four basic things to survive: food, water, cover, and a place to raise their young. These four elements make up a habitat.

Extensions
- Refer to the Disneynature AFRICAN CATS Activity Guide for more fun and informative lesson plans on habitats. Included in the Activity Guide are instructions on how to create your own classroom habitat, an interactive matching game to explore the roles of animals on the savanna, and a lesson plan for outdoor exploration into habitats near your school.
- Explore a habitat in your area – even if it is just a garden or tree near your school. Look for sources of food, water, cover, and places for animals to raise their young. Make a list of all the different types of habitat components you find there and what animals might make use of these elements.
- Create a wildlife habitat in your schoolyard. Identify the native wildlife that lives in your area and their habitat needs. Visit http://www.nwf.org/Get-Outside/Outdoor-Activities/Garden-for-Wildlife/Schoolyard-Habitats.aspx to learn more about creating a wildlife habitat at your school.

Evaluation
- To evaluate student comprehension, have students correctly answer the corresponding question on the Big Ideas for Big Cats cards.

Want to further your classroom conservation work? Visit Disney.com/planetchallenge TODAY!
WHAT DOES MY HABITAT LOOK LIKE?

Use the space below to draw a picture of your habitat. Be sure to include food, water, and cover!

Explore a habitat near your school! Look for examples of food, water, cover, and a place for animals to raise young.
The African Savanna

WHAT MAKES UP THE SAVANNA HABITAT?

People Cards

Food Cards

Water

Insect

Cover

Fruit

Food

Antelope

Grass

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WHAT DO LIONS AND CHEETAHS NEED TO SURVIVE?

Grade: 4–6 | Length of Activity: 1 hour | Subjects: Science, Graphing | Staff: One teacher or volunteer

DESCRIPTION
Students will first learn the four basic requirements that an animal needs to survive by drawing an ideal lion or cheetah habitat. Then, they will try to “survive” changes in a fast running game where students choose to become either an African cat or a habitat component. In this game, students examine the habitat requirements of lions and cheetahs, which include food (prey), water, cover, and a place to raise their young. Students discover that as these four requirements change, the size of the lion and cheetah population will also change.

OBJECTIVES
Through participation in this activity students will:
• Understand the habitat requirements that lions and cheetahs need to survive (food, water, cover, and a place to raise their young).
• Graph the fluctuations in a population of lions and cheetahs.
• Identify two factors that can change a population.

POSITIVE ACTIONS TO HELP AFRICAN CATS
Learn more about the savanna habitat and the wildlife that lives there by reading books and visiting websites.

MATERIALS
• Outdoor space or open field
• Masking tape, rope, or sidewalk chalk
• Colored pencils, crayons, or markers
• Worksheet 19: What do lions and cheetahs need to survive? – activity sheet
• Worksheet 20: Data Sheet – data recording sheet
• Worksheet 21: How did the African cat population change as their habitat changed? – activity sheet

SET UP
• Make copies of worksheets 19 and 21 for each student. Make one copy of worksheet 20 to record data.
• Divide an open field or schoolyard in half. Use masking tape, rope, or sidewalk chalk to create two parallel lines approximately 50 feet apart.

SAFE PRACTICES
Make sure the field or schoolyard is safely prepared for student activity. Be sure to check for any trip hazards or sharp objects that could be dangerous for students.

Procedures

What is a Habitat?
1. Open the discussion by asking students what types of requirements they need to survive (i.e. food, water, cover). Ask them to explain the difference between a “need” such as water and a “want” such as soda.
2. Then ask students to brainstorm a list of things they think lions and cheetahs need to survive. Record this list on a chalkboard, white board, flip chart, or SMART™ board. Discuss the list and have students evaluate what is on the list and if it should remain on the board.
3. Distribute worksheet 19: What do lions and cheetahs need to survive? and colored pencils, crayons, or markers to each student.
4. Review the activity instructions on the worksheet. Have students draw their own lion or cheetah habitat based on the list of habitat elements they generated.
5. Once students have completed the worksheet, ask them to explain why they chose to include the elements shown in their picture. Be sure each student has drawn at least one example of food, water, cover, and a place to raise young.

Outdoor Game: What do Lions and Cheetahs Need to Survive?
1. Take the class outside and be sure the area is safe for activities. Divide students into two smaller, equal sized groups. One group will be African cats (designate half of this group lions and the other half cheetahs); the other will be habitat components (food, water, and cover.) Before beginning, ask students to predict how they think the lion and cheetah populations will change as their food, water, and cover change.
2. Have the groups stand at opposite ends of the field, behind their designated lines.
3. To recognize habitat components, the students should use hand motions to describe which element they are or
The African Savanna

WHAT DO LIONS AND CHEETAHS NEED TO SURVIVE? (2 of 3)

which element they need. For food, students should place both hands over their stomach. For water, students should make a wave motion with their hands. For cover, students should create a “roof” over their head by touching their hands together in a triangle shape. Demonstrate each of these to the class.

4. Have both groups turn around so they are facing away from each other. The habitat group should decide which element they are going to be; the African cat group should decide what element they need. Have each person make the hand motion to describe their habitat element. Use the data sheet (worksheet 20) to record the number of lions, number of cheetahs, and the number and type of each habitat element chosen before beginning the game.

5. Have both lines turn around and start the game on the count of three. Students should try to find their match as quickly as possible in order to “survive”. Pairs should only include one person from the African cat group and one person from the habitat components group. The habitat person can only satisfy one African cat, so if two or more cats try to pair with the same habitat person, only the first one to reach the habitat person survives. The rest must find another match.

6. Once someone from the African cat group finds its habitat match, they should pair up and walk back behind the African cat line. Since this African cat has found its survival need, it will be able to live and reproduce. The person who was the habitat match will now become an African cat (they should become the same African cat – either a lion or cheetah – as their partner).

7. Any lion or cheetah that is not able to find their needed habitat requirement will “not survive” and will become a habitat component, returning nutrients back into the environment. This person should move to the other side of the field, behind the habitat line.

8. Once all students have returned to their appropriate ends of the field, record the number of habitat components and surviving lions and cheetahs on the data sheet.

9. Repeat steps 5-9 several times (about 10-15 rounds of the game will provide enough data on how the African cat population changes as habitat fluctuates). Students may change their habitat component at the beginning of each round, but not once the game is in play. Students should not change the type of African cat they are during the game (except for when turning from a habitat component into an African cat).

Conclusion

10. After completing the activity, discuss the class’ findings by posting their data at the front of the class. Grades 5-6 may choose to graph their findings using worksheet 21: How did the African cat population change as their habitat changed? Students could also use a database program such as Microsoft Excel to create a table and graph on the computer.

Wrap-up

Use the following discussion points or questions to encourage further discussion:

• Compare and contrast the habitat requirements of people to the habitat requirements of African cats. What have you learned about the needs of lions and cheetahs based on the activities you completed in this lesson?

• Summarize what happened to the African cat population over time. Compare the trends observed in the game to your initial predictions. Overall trends may differ, but students should conclude that habitat components naturally fluctuate and directly influence the size of lion and cheetah populations.

• How did you feel as a lion or cheetah as your habitat requirements (food, water, and cover) fluctuated? Students should likely feel more pressure to find a match when there are fewer resources available. When there is plenty of food, water, and cover available, the rush to find a match should not have felt as pressured.

• Analyze the relationships between the amount of habitat components and the lion and cheetah populations. How are these two variables related? Students should see that as habitat components increased, the number of African cats increased. However, the number of lions and cheetahs may not always be equal.

• In your opinion, is this game an accurate representation of the relationship between habitat components and African cat populations on the savanna? Justify your answer using your existing knowledge of connections between organisms and their environment. Students should conclude that lions and cheetahs often compete for the same resources, which can cause conflict on the savanna.

In this game, students examine the habitat requirements of lions and cheetahs, which include food (prey), water, cover, and a place to raise their young. Students discover that as these four requirements change, the size of the lion and cheetah population will also change.
Extensions

- Refer to the Disneynature AFRICAN CATS Activity Guide for more fun and informative lesson plans on habitats. Included in the Activity Guide are instructions on how to create your own classroom habitat, an interactive matching game to explore the roles of animals on the savanna, and a lesson plan for outdoor exploration into habitats near your school.
- Visit a zoo that has a lion or cheetah exhibit. Identify habitat components within the exhibit.

Evaluation

As an engaging way to evaluate student comprehension, have students correctly answer the corresponding lesson questions on the Big Ideas for Big Cats card and then place it in the proper location on the bulletin board.
What do lions and cheetahs need to survive?

Select the items below that a lion or cheetah would need to survive — remember to include food, water, cover, and a place to raise young. Create a savanna habitat by drawing them in the space provided. Then, draw your lion or cheetah living in its savanna home.

- iceberg
- tall grass
- house
- pizza
- den
- zebra
- watering hole
- antelope
- short grass
- seaweed
- roller blades
- tree
- river
At the beginning of each round of play, record the number of surviving lions, cheetahs, and habitat elements in the table below.

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<tr>
<th>ROUND 1</th>
<th>Number of Habitat Elements</th>
<th>Number of Lions</th>
<th>Number of Cheetahs</th>
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<td>ROUND 2</td>
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</table>
HOW DO AFRICAN CAT POPULATIONS CHANGE?

Use the data your teacher recorded from the game to graph changes in the African cat population over time. Plot changes in the lion population using one color, changes in the cheetah population using another color, and changes to the habitat elements using a third color. Color the boxes in the key accordingly.

CHANGES IN THE AFRICAN CAT POPULATION OVER TIME

Visit a local zoo that has lions or cheetahs to witness these big cats in person and learn more about their wild counterparts!