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**AFRICAN
CATS**

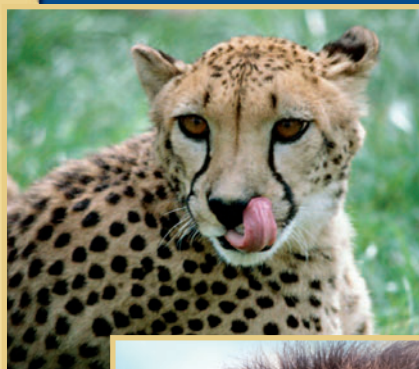


EXPANDED EDUCATOR'S GUIDE

EXPANDED EDUCATOR'S GUIDE

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U.S. Standards Alignment Chart

National Science Education Standards Alignment

	GRADES K-4						GRADES 5-8					
	Understanding about Scientific Inquiry	The Characteristics of Organisms	Life Cycles of Organisms	Organisms and their Environment	Understanding about Science and Technology	Changes in Environment	Understanding about Scientific Inquiry	Structure and Function in Living Systems	Regulation and Behavior	Populations and Ecosystems	Diversity and Adaptations of Organisms	Populations, Resources, and Environments
How does the African savanna compare to where I live? (Educational Activity Guide)												
What jobs do living things have on the savanna? (Educational Activity Guide)												
Can you become an African cat Olympian?												
What's in a habitat?												
What do lions and cheetahs need to survive?												
How does energy flow on the African savanna?												
Who is part of the savanna food web?												
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What technology do researchers use to study African cats?												
What are threats to cheetahs and lions in the wild?												
How can I help wildlife?												
How do science-based conservation solutions protect African cats?												



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Assessment Tool

BIG IDEAS FOR BIG CATS

Grade: **2–6** | Length of Activity: **30 minutes** | Subjects: **Science, Language Arts** | Staff: **One teacher or volunteer**

OBJECTIVES

By conducting all parts of the Big Ideas for Big Cats activity, teachers will be able to:

- Determine the students' knowledge, attitudes, and behaviors about African cats, before viewing the film and participating in the provided lessons.
- Adapt teaching styles and content to address the gaps in students' knowledge, attitudes, and behaviors about African cats.
- Assess the change in the students' knowledge, attitudes, and behaviors about African cats, after viewing the film and participating in the provided lessons.

Procedures:

Formative Assessment

1. Before conducting any of the provided lessons, lead a class discussion about African cats using the following questions.
 - What do you know about African cats?
 - What questions do you have about African cats?
 - How do you feel about African cats?
 - What can you do to protect African cats?
2. Teachers can have the students answer these questions individually in a questionnaire form or in small groups and then share with the rest of the class or answer the questions in front of the entire class using a flipchart or whiteboard.
3. Be sure to save students' responses to these questions.

Conduct Lessons

4. Conduct each of the lessons provided in the Activity Booklet and Educator's Guide. At the end of each lesson, use the *Big Ideas for Big Cats* assessment cards to summarize the main ideas of each lesson. This is a fun way to assess what the students are taking away from each lesson. It also provides an opportunity for teachers to identify and reinforce concepts with students.

5. As you complete each set of *Big Ideas for Big Cats* assessment cards, post the cards on a bulletin board to create a poster of Africa's amazing big cats.

Summative Assessment

6. After viewing the film and conducting the lessons from the Activity Booklet and Educator's Guide, lead another class discussion using the same questions as in the formative assessment.
 - What do you know about African cats?
 - What questions do you have about African cats? (Can you answer the questions posed in the pre-assessment?)
 - How do you feel about African cats?
 - What can you do to protect African cats?
 - What did you learn about African cats?
7. Compare the students' responses from the formative assessment to those from the summative assessment. Teachers should expect to see an increase in the students' depth of understanding of African cats based on their knowledge of the topics presented in the lessons. It is always more difficult to show positive changes in attitude and behavior of students, but hopefully if the film and the lessons inspired students, they may feel and act differently afterwards.



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WELCOME TO THE WORLD OF AFRICAN CATS

Educator's Background Information

Africa! The very name conjures up images of adventure, beauty, and wilderness. From its vast savannas to its lush tropical rainforests, Africa is truly a magical place.

Africa's wildlife is legendary; perhaps none so much as its cats, the lion and the cheetah. Since the beginning of recorded history, these cats have fascinated and inspired us with their power, speed, grace, and beauty. Unfortunately, today these amazing animals face an uncertain future.

To appreciate these remarkable animals we must first learn about their African home. Many of us think we know about Africa by watching TV and movies. However, they only give us a limited view of this immense continent. Did you know that...

Africa is Big

When you think of Africa, think seriously large! Just how big is Africa? It's the second largest continent on earth and makes up about 22% of the world's total land mass. In total, Africa is 11,668,545 square miles. That's over 11 billion football fields. Africa is so big it could hold the land occupied by China, India, Europe, Argentina, New Zealand and the continental United States, with room to spare!

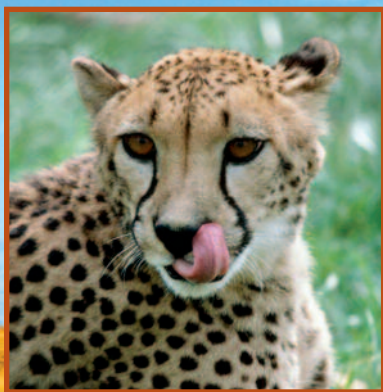
Even its wildlife is big! It is home to the African elephant—the largest living land mammal, the gorilla—the largest living primate, and the giraffe—the tallest animal on earth. It's also home to the world's largest and heaviest beetle, the goliath beetle, which can reach up to 5 inches in length and weigh up to ¼ pound.

Africa is Diverse

Africa is not just one country! It's actually made up of 53 individual countries. You're probably familiar with some of these places, like Egypt, South Africa, Ethiopia, and Kenya. But many countries within Africa are less well-known, like Gabon, Côte d'Ivoire, Senegal, Mozambique, and Lesotho, a mountainous country completely surrounded by the country of South Africa.

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The African continent is home to more than 700 million people, who speak more than a thousand different languages. Some of these languages, like English, Arabic, Berber, Hausa, French, Swahili, and Yoruba, are spoken by millions, while others are only spoken

by isolated groups. South Africa has 11 different official languages, including Afrikaans, English, Isizulu, Sepedi, Sesotho, and Tshivenda. The African country of Nigeria has over five hundred languages and is considered one of the greatest concentrations of linguistic diversity in the world.

This diversity of languages is representative of the melding of various cultures seen throughout the continent. There are over 800 ethnic groups in Africa. These include people of African origin as well as those from Asia, Europe, and Arabia, who have permanently settled there—in some cases for centuries. Some countries have 20 or more different ethnic groups within their boundaries. Each has its own distinct language, traditions, arts and crafts, history, way of life, and religion. At the same time, over the centuries, these different groups have influenced, contributed to, and enriched one another's culture. Some of the more widely known ethnic groups in Africa include Ashanti, Bantu, Bushmen, Kikuyu, Malinke, Moors, Samburu, Swahili, and Masai.

Although the majority of the people in Africa live in rural areas, the continent is urbanizing fast. Today over a third of the population lives in cities. Egypt's capital city, Cairo, is

Africa's largest city and home to over 9 million people. Those who live and work in these major metropolitan areas live like city residents around the world. They drive cars, have televisions in their homes and apartments, have computers with access to the Internet, are educated in excellent schools, and continue on to colleges and universities.

In contrast, there are ethnic groups living in rural Africa whose lifestyles have remained virtually unchanged for centuries. From desert nomads to the pygmies of the rainforest to the tribesmen of the central plains, these groups have a rich cultural heritage that has been passed down from generation to generation with very little influence from the outside world.

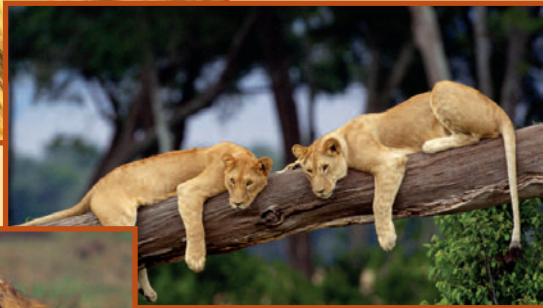
Africa is Rich in Natural Beauty

Africa's environment is as rich and diverse as its people. From the majesty of Mt. Kenya to the coastal beauty of Cape Town, from the spectacular views of Victoria Falls to the teeming diversity of wildlife in the Okavango Delta, Africa is beautiful.

Due to its location along the equator, diverse geography, and immense size, Africa's environments are both varied and distinct. Those regions nearest the equator are some of the hottest in the world and receive year-round rainfall. Those north and

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south of the equator experience short dry winters, cooler temperatures, and lower rainfall. The result is a continent with environments that range from the hot deserts of the

Sahara to the tropical rainforests of the Congo, the glacial peaks of Mt. Kilimanjaro in Tanzania, to the vast savannas of the Masai Mara in Kenya.

Africa is Abundant with Wildlife

This tremendous variety of environments has resulted in an amazing array of wildlife species. Many of our most beloved and recognized species live in Africa, including lion, elephant, gorilla, cheetah, giraffe, hippo, flamingo, meerkat, warthog, and rhino. Not all of Africa's species are well-known, however. The okapi, goliath frog, naked mole-rat, pangolin, aye-aye, and shoebill stork are just a few of Africa's strange and lesser known species.

African Cats: The Wildlife-People Connection

Africans have always shared their lives with wildlife, including the lion and cheetah. This close connection is reflected in their art, dance, music, and stories.

The cheetah's long association with humans dates back to the Sumerians, about 3,000 BC, where a leashed cheetah is depicted on an official seal.

Throughout history, humans have long been amazed by the beauty and strength of the African lion. Assyrian kings took, kept, and bred lions as pets as early as 850 BC. Lion images have been discovered carved in rock work that are about 10,000 years old. These petroglyphs depict many animals such as lions, giraffe, herds of antelope, ostrich, and cattle—all very important parts of the savanna to the people of that time.

Today, human population growth, people's increasing demand for land, a reduction in prey, conflicts between lions, cheetahs, and farmers, and poaching have led to greatly diminished numbers of both cheetah and lion. With diminishing space, cheetah and lion are forced into smaller territories that put them in closer proximity to each other and to people. Fortunately, others realize that predators are a valuable resource for the country because they not only play an important role in the tourist industry, but they also help to maintain a balanced natural environment.



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AFRICAN CAT CLASSIFICATION

Educator's Background Information

All living things are categorized and identified in a classification system. The classification system groups living things into a specific kingdom, phylum, class, order, family, genus, and species according to their common characteristics. Moving from kingdom to species, there are less animals and more specific and shared characteristics. Some common characteristics used to classify living things are: reproduction, number of legs, respiration, size, body segments, movement, body covering, shape, and how they obtain and eat food. The purpose of the classification system is to create an organized way for people to understand living things.

The first classification category, the kingdom, is the broadest of all classification categories. For lions and cheetahs, we will be focusing on the *animal kingdom*. Animals are a group of organisms that are capable of movement, feed on other organisms, and have the ability to sense their environment. To further categorize animals in the animal kingdom they are classified into two major categories, or phyla, based on the type of skeleton they possess: invertebrates and vertebrates. If an animal has a backbone it is grouped as a vertebrate. If the animal does not have a backbone then it is grouped as an invertebrate. Since both lions and cheetahs have a backbone, they are both *vertebrates*.

Once an animal has been classified into a phylum, they are then categorized further into another broad category called a class. Vertebrates are divided into five classes: mammals, birds, reptiles, amphibians, and fish. Considering the characteristics of lions and cheetahs, they would be included in the *mammal class*.

At this point, the classification system begins to narrow to more specific groups and species of animals that are familiar. African cats are classified in the order called *Carnivora*, which means that all animals in this category eat meat. African cats are further classified into the family called *Felidae*, which means that animals in this level are all cats and share common physical and behavioral characteristics such as claws, sharp teeth, tails, rest a large portion of the day, quick speed, and vocalizations.

Even though all African cats are similar and share many physical and behavioral characteristics, they are each unique in different ways, which leads us to our final classification categories – *genus* and *species*. Here are a few genus and species names for African cats.

1. Genus species: *Acinonyx jubatu*
a. Cheetah
2. Genus species: *Panthera pardus orientalis*
a. Leopard
3. Genus species: *Panthera leo*
a. Lion
4. Genus species: *Caracal caracal*
a. Caracal
5. Genus species: *Leptailurus serval*
a. Serval

In the list of the cats above, note that some have the same genus name, which means that those cats have more traits in common. For example, *Panthera* includes both lions and leopards, so they are more closely related to each other than to the other cats.



AFRICAN CAT CLASSIFICATION *CONT'D***Comparing Africa's Cats**

Lions and cheetahs share their home with other cat species. Each has their own special adaptations and characteristics.

**LEOPARD**

- Powerful and graceful, the elusive leopard is a master of stealth and survival. By far the strongest climber of Africa's big cats, it can haul prey twice its own body weight up into a tree where it can feast without disturbance from other predators.
- Solitary nighttime hunters, they are difficult to see even during the day thanks to their tawny coat covered with dark, irregular circles called "rosettes" that provide excellent camouflage amongst the trees.

**CARACAL**

- Named after the Turkish word for "black-eared," this handsome small cat has dense short reddish-brown fur and as the name states, long, narrow, black-tipped ears. Its body is long and slender, with long legs and a tapering tail.
- Sometimes called a desert lynx or African lynx, experts disagree on whether or not a caracal is truly a lynx. It is found mainly in dry savanna and scrub but avoids sandy deserts.
- The caracal is skilled at jumping and climbing. It's an agile hunter that captures its prey by stalking and leaping after small mammals, rodents, and even low-flying birds!

**SERVAL**

- This small to medium sized cat has a slender build with back legs that are longer than its front legs. Its coat is yellowish tan with black spots, bands, and stripes. Like a zebra's stripes, the pattern of every serval's coat is different. With its small head, large erect rounded ears, and long neck, it bears some resemblance to the cheetah.
- Elusive and shy, servals are for the most part night-time hunters, hunting by sight and sound. They have an excellent sense of hearing and can even target prey that is moving underground. Once it hears its prey, the serval quietly approaches and then pounces.
- The fur trade continues to be a threat to servals and many other small wild cats. To make just one coat from these cats requires a very large number of skins, due to the intricate process of matching spots, stripes, and bars.

WHERE DO LIONS AND CHEETAHS LIVE?

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

DESCRIPTION

This activity will introduce students to the countries where lions and cheetahs live. Students will use their independent research skills to create a list of countries where lions and cheetahs are currently found. Then, using a map of the African continent, students will color in the countries where lions and cheetahs live. Students will discover that lions and cheetahs are currently found in about two-thirds of African countries.

OBJECTIVES

Through participation in this activity students will:

- Conduct their own research to identify and explain why lions and cheetahs live in certain countries and not in others.
- Color a range map to indicate the countries where lions and cheetahs are found.
- Compare two countries where lions live versus two countries where cheetahs live. How are the countries the same and/or how are they different?

POSITIVE ACTIONS TO HELP AFRICAN CATS

See DisneyNature's **AFRICAN CATS** film to witness the amazing world of lions and cheetahs and learn more about the African savanna.

MATERIALS

- Computer or library for researching where lions and cheetahs live
- Worksheet #5: *Where do lions and cheetahs live?* – Africa map
- Two different colored pencils (red and blue) for each student

SET UP

- Make copies of the *Where do lions and cheetahs live?* worksheet for the class
- Power on a classroom computer or reserve a computer lab to allow students to conduct their own research

Procedures

1. Review the background information with your students. Discuss with students what characteristics make up a country and how they differ from continents or states or cities. There are many definitions, but a **country** can be defined as a geographical region with a government and political borders. Ask students for some examples of African countries.
2. Teach students that in most cases, countries make up continents. For example, the United States, Canada, and Mexico make up the continent of North America. Explain that on the African continent, there are 53 different countries! These countries are very different and made up of many people, cultures, languages, and habitats. African cats like lions and cheetahs are only found in some of these countries.
3. Explain to the class that for this activity, they will be doing their own research. Have students compile a list of the countries in which lions and cheetahs are found. The following websites may be helpful if students are having difficulty:
 - Cincinnati Zoo's *A Voice for the Cheetah* Guide: http://www.cincinnati-zoo.org/discovery/schools/documents/CheetahGuide_K-6.pdf
 - *A Library of the World's Animals* Lion distribution map: <http://www.learnanimals.com/lion/lion-distribution.php>
4. Distribute the "Where do lions and cheetahs live?" worksheets and two colored pencils (one red and one blue) to each student.
5. Review the instructions on the worksheets with the class. Using their list of countries, students should color in the countries where lions and cheetahs are found. After students have completed the activity, review their worksheets (using the answer key provided) to see if they have correctly colored in the ranges for lions and cheetahs.

Wrap-up

Discuss findings with the class using the questions below:

- Based on the map you have colored, name at least two countries where cheetahs are found and two countries where lions are found. *See the answer key for a complete list of countries.*



African Cat Classification

WHERE DO LIONS AND CHEETAHS LIVE? (2 of 2)

- Compare the list of countries where lions and cheetahs are found to the number of countries in Africa. What do you notice about the range of lions and cheetahs? *Lions and cheetahs are found in about two-thirds of the countries in Africa.*
- Describe the similarities and differences between the list of countries where lions are found and the list of countries where cheetahs are found. *The majority of countries are home to both lions and cheetahs. However, lions are found in more countries than cheetahs. There are also some countries where only one of the two cat species is found.*
- Predict why there are some countries that do not have lions or cheetahs. *Lions are not typically found in countries with thick tropical rainforests or extensive deserts. Cheetahs can live in desert habitats, but they are very sensitive to changes. Both of these African cats have also disappeared from countries due to conflicts with people.*
- Based on the map of countries you have colored, which species seems to be at a greater risk? Explain why you think this. *Students should conclude that there are more areas where lions are found and fewer areas where cheetahs are found. This could put cheetahs at a greater risk, because they have less space to occupy and potentially fewer resources.*

Lions and cheetahs are currently found in about two-thirds of African countries.

Social Studies Extension

The Disney nature film **AFRICAN CATS** takes place in Kenya. People play an important part in conserving wildlife. Encourage the class to research more about Kenyan children who are the same age as them. Have students work in small groups to create a poster answering some of the following questions:

- What kind of musical instruments do the children of Kenya play?
- What kind of music do they listen to?
- What do their schools look like?
- What games do they play?

- What kind of clothing do they wear?
- What languages do they speak?
- What kind of food do they eat?
- How do they feel about living near lions and cheetahs?

Here are some helpful websites to direct students in their research:

- Official tourism website operated by the Kenya Tourist Board:
<http://www.magicalkenya.com/>
- National Geographic Kids information on the people and places of Kenya:
<http://kids.nationalgeographic.com/kids/places/find/kenya/>
- Information on Kenya written in a child-friendly style:
<http://www.kids-4-kenya.org/learn-about-kenya/history-of-kenya.cfm>
- Interview with a middle school student from Nairobi, Kenya:
<http://www.timeforkids.com/TFK/teachers/aw/wr/article/0,28138,643794,00.html>
- Spoken words in Swahili:
<http://www.timeforkids.com/TFK/teachers/aw/wr/article/0,28138,644020,00.html>
- Kenyan recipes:
<http://www.whats4eats.com/africa/kenya-cuisine>
<http://www.kids-4-kenya.org/recipes/index.cfm>
- Kenyan music playlist:
<http://worldmusic.about.com/od/venues/tp/KenyaMusicPlaylist.htm>

To create a deeper connection with Kenyan culture, help students make their own instruments using craft supplies, play African music in the classroom, bring in African food to taste, and have students listen to and practice speaking the Swahili language.

Evaluation

- To evaluate student comprehension, have students correctly answer the corresponding questions from the set of *Big Ideas for Big Cats* cards.



African Cat Classification

WHERE DO LIONS AND CHEETAHS LIVE?



African Cat Classification

WHERE DO LIONS AND CHEETAHS LIVE?

ANSWER KEY

Use the list of countries below to help students when coloring their Africa map.

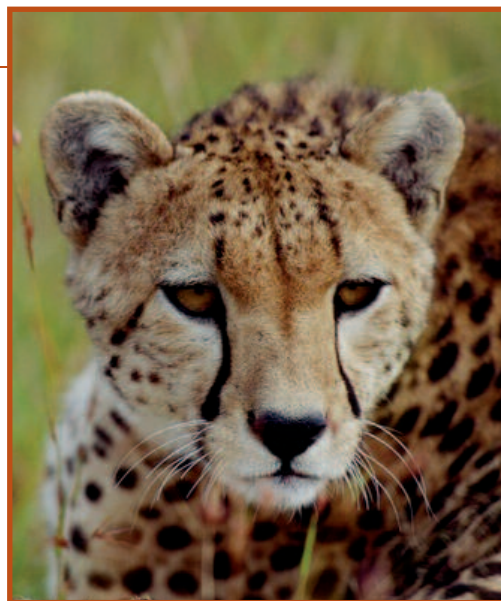
Color the countries where lions live in blue.

Angola	Mali
Benin	Mozambique
Botswana	Namibia
Burkina Faso	Niger
Burundi	Nigeria
Cameroon	Senegal
Central African Republic	Somalia
Chad	South Africa
Congo	Sudan
Democratic Republic of Congo	Swaziland
Ethiopia	Rwanda
Gambia	Tanzania
Ghana	Togo
Guinea	Uganda
Kenya	Zambia
Malawi	Zimbabwe



Color the countries where cheetahs live in red.

Algeria	Mali
Angola	Mauritania
Benin	Mozambique
Botswana	Namibia
Burkina Faso	Niger
Cameroon	Somalia
Central African Republic	South Africa
Chad	Sudan
Democratic Republic of Congo	Tanzania
Ethiopia	Uganda
Kenya	Zambia
Malawi	Zimbabwe



Witness the amazing world of African cats and their neighbors! See DisneyNature's new film AFRICAN CATS in theaters.

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TOOLS FOR SURVIVAL

AFRICAN CAT ADAPTATIONS

Educator's Background Information

Strength, elegance, power, and speed – no wonder lions and cheetahs are considered some of the most beautiful animals on Earth! The physical characteristics that make them so stunning to watch are more than just for looks. They provide them with the tools to hunt and survive life on the savanna.

Staying Alive

Drought, heat, rain, sun, predators, rocks, and harsh terrain: life on the savanna isn't easy!

Fortunately, lions and cheetahs have special physical and behavioral characteristics or **adaptations** that allow them to survive in this beautiful, yet harsh environment.

These include:

- The cheetah's spots and the lion's sandy color help them hide and stalk prey in the savanna's tall grasses.
- A strong sense of smell, excellent hearing, and fantastic vision help them find prey and avoid conflicts with other predators. A cheetah can spot prey from as far as 3 miles away!
- Sensitive whiskers help them navigate through their environment, especially at night by detecting changes in air currents. Roughly as wide as the cat's body and sensitive to pressure, these whiskers also act as natural "rulers" by helping them determine the size of an opening before they get stuck.
- Dark "tear stains" below the cheetah's eyes. Unlike most African predators, cheetahs hunt during the day. These markings may act like sunglasses, reducing glare and directing sunlight away from the cheetah's eyes.
- The male lion's thick mane helps it look bigger and protects its throat when fighting off predators.
- The lion's famous roar. These and other loud vocalizations allow them to communicate to other pride members, call out territories, and warn off other lions from long distances. The roar of an adult male lion can be heard up to five miles away!
- The quiet chirp of the solitary cheetah helps it communicate to its cubs without drawing the attention of lions, hyenas, and other larger, stronger predators.

Physical differences actually prevent the cheetah from being able to roar like other large African cats.

Adaptations for Hunting

Cheetahs and lions are spectacular hunters. As predators, they have special adaptations to catch, kill, and eat their prey:

- **Long tails** help them balance and steer during the hunt.
- **Padded, textured paws** provide protection from rocks and thorns and better traction for running and hunting.
- **Sharp, pointed teeth** are used to bite and hold prey and tear meat from the bone.
- **Rough tongues** act like sandpaper, helping them scrape every bit of meat from the bones of their prey. If you have ever been licked by a house cat you know how rough their tongue can be!
- **Eyes positioned in the front of their head** (binocular vision) give them depth perception and the ability to judge distances when stalking or chasing prey.

Different Cats Different Strategies:

Strength vs. Speed

While both cheetahs and lions are amazing athletes, each have different adaptations designed to support their different hunting strategies.

The Cheetah: A Speedy, Solitary Hunter

Cheetahs are like track stars, with every part designed for speed. When they spot prey, they can accelerate from 0 to 60 mph in only three seconds. That's faster than most cars!

How is this possible? Long legs, a flexible collar bone, and a springy backbone that bends in both directions help cheetahs take long, ground-covering strides. A cheetah moving at top speed can cover over 20 feet in a single stride! The bones on a cheetah's feet and legs are specially adapted to take the pounding of a hard run. Like other cats, cheetahs run on their toes. This makes it easier for them to make sudden turns without losing their balance.

Like cleats on a track shoe, the cheetah's long claws help them grip the ground as they run.

Unlike those of other cats, the claws of a cheetah are always extended. In fact, cheetahs are the only cats that can't fully retract their claws (their claws are semi-retractable).

A lean, muscular build and smaller head makes the cheetah strong, yet lightweight and streamlined. Enlarged nostrils, heart, lungs, liver, and sinuses provide their muscles with the extra oxygen and blood they need to function at top speeds. All these adaptations help the cheetah to stretch further, take longer strides, and run faster than any other land mammal. At full speed a cheetah can run 70 mph for short distances and cover an amazing 92 feet in a single second!

Unfortunately, the very same adaptations that make the cheetah the fastest land animal also make it less able to defend itself and its food from other predators. The jaws of a cheetah are not as large and strong as many other African carnivores. Because of this, cheetahs would rather flee than fight, and they often lose their hard won meals to lions, leopards, hyenas, and even vultures.

The African Lion: Dominance through Power and Numbers

If the cheetah is the sprinter of the animal world, the lion is more like a wrestler, using its power and strength to grab and

pull down prey. Unlike cheetahs, lions usually hunt at night, when they use their exceptional hearing, tan camouflaged coloration, stealth, and strength to locate, stalk, and ambush their prey. Using their powerful, heavily muscled front legs and shoulders, a lion can knock down a full grown zebra or stun a large antelope simply with a blow to the head or hindquarters with their massive forepaws. Unlike the cheetah, the lion's impressive claws are retractable, which allow them to stay sharp for hunting. A lion's large, sharp canine teeth are shaped like steak knives and are used for biting, holding onto its prey, and tearing large chunks of meat. A lion's loose belly skin helps it avoid injury if kicked by prey during a hunt.

Unlike the usually solitary cheetah, lions find strength in numbers. They are the only species of cat that live and hunt in groups. These groups, or "**prides**", usually consist of one resident male (or even two to three brothers), along with a core of related females (mothers, sisters, cousins, and aunts) and their cubs. The males help the females protect the pride while the females do most of the hunting. Hunting as a group increases their opportunity to stalk and ambush more prey and to hunt much larger prey than a single lion ever could. Lions have even been known to attack elephants when other prey is scarce!



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Lion Fact Sheet

The lion is the most powerful carnivore on the African savanna. Physical characteristics of the lion help it catch and take down prey. Female lions hunt in groups, which helps them take down large prey such as zebra, antelope, Cape buffalo, and giraffe.

- Eyes**
- Binocular vision and large eyes provide excellent eyesight. Binocular vision allows a lion to correctly judge distance when stalking prey.
 - Excellent night vision helps a lion hunt. Lions and people see equally well during the day, but a lion's night vision is six times more powerful than human eyesight.
- Ears**
- A lion relies heavily on its acute hearing when hunting.
 - Lions rotate and move their ears constantly for better sound location of prey when hunting.
- Teeth**
- Large, sharp canine teeth help catch and kill prey.
 - Scissor-like molars, or carnassials, are used to rip off chunks of flesh from prey.
 - A lion's tongue is rough and covered with tiny hooks called papillae that help to scrape flesh off the bones of prey.
 - Powerful jaws help a lion grab and kill prey quickly.
- Bones**
- Has strong front legs and muscular shoulders that help knock down large prey that might otherwise outrun the lion.
- Fur**
- Solid tan fur helps a lion blend or camouflage in tall grass when stalking prey.
- Tail**
- Has a long, powerful tail to help with balance.
- Legs**
- Has short but strong, sturdy legs that enable a lion to sprint and catch large prey.
- Feet**
- Padded paws increase traction while running and allow a silent approach.
- Claws**
- Has long, curved claws, like fish hooks, to grab and hold prey.
 - Able to retract super sharp claws to protect them from getting worn down while walking. Retractable claws are quieter and make it easier to surprise prey.

Cheetah Fact Sheet

The cheetah lives on the savannas of Africa. It is a large predator like other members of the cat family. Physical characteristics of the cheetah help it to hunt and catch prey at very fast speeds, making it the world's fastest land mammal. It is lacking power and strength in exchange for speed and agility.

- Eyes**
- Has fantastic vision that helps the cheetah spot prey as far as 3 miles (5 km) away.
 - Binocular vision and large eyes provide excellent eyesight. Binocular vision allows a cheetah to correctly judge distance when stalking and chasing prey, making sight its most important sense.
 - The dark tear marks below the eyes may help keep the sun's glare out of the eyes, similar to sunglasses.
- Ears**
- Has excellent hearing which helps a cheetah hunt for prey.
 - Rounded ears are reduced in size to help make the cheetah's head more streamlined.
- Nose**
- Wide nostrils increase oxygen while running.
- Teeth**
- Sharp teeth are designed to catch and kill prey.
- Bones**
- Has a flexible spine which helps a cheetah stretch out further and take longer strides when running.
- Body**
- Has a streamlined body shape that is long and thin with a small head which helps a cheetah run faster.
 - Has very deep chest with a large heart and lungs which pump blood and oxygen to the muscles at quick speeds.
- Fur**
- Tawny coat with round black spots helps it blend into grasses and breaks up a cheetah's silhouette, making it easier to hide from other predators and stalk prey.
- Tail**
- Has a long strong tail that helps with balance when running quickly and making sharp turns.
- Legs**
- Has long thin legs that allow for longer strides when running.
 - Long legs help a cheetah quickly accelerate up to 60 mph in 3 seconds.
- Feet**
- Padded paws increase traction while running.
- Claws**
- Has semi-retractable claws that help grip the ground while running, similar to sports cleats.

Tools for Survival: African Cat Adaptations

CAN YOU BECOME AN
AFRICAN CAT OLYMPIAN?

Setting: **Classroom** | Grade: **2-6** | Length of Activity: **1 hour** | Subjects: **Science** | Staff: **At least one teacher or volunteer**
(additional staff may be helpful for running multiple activities or class management)

DESCRIPTION

To strengthen their connection with lions and cheetahs, students will test their cat-like skills in several games that make up the *African Cat Olympics*. These games encourage the use of kinesthetic learning to provide an engaging experience focused on the behaviors and adaptations of African cats. African cats such as lions and cheetahs have unique physical adaptations that make them top predators in their environment.

OBJECTIVES

Through participation in this activity students will:

- Understand the terms **adaptation** and **competition**.
- Distinguish between a predator and prey.
- Describe two examples of lion and cheetah adaptations.
- Become "African Cat Athletes" by using imagination, play, and movement to learn about physical adaptations of African cats.

POSITIVE ACTIONS TO HELP AFRICAN CATS

Thanks to their amazing adaptations, lions and cheetahs are top predators on the African savanna. Learn more about lions and cheetahs by reading books and visiting websites listed in the educator's guide.

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.

MATERIALS**Lion's Leap**

- Worksheet #7: *Lion's Leap Paws-a-gram*
- Measuring tape
- Masking tape or sidewalk chalk

Cheetah Relay Race

- Sunglasses (1 pair for each station)
- Spotted t-shirt or coat (1 for each station)
- Sneakers or soccer cleats (1 pair for each station)
- Baton (or decorated paper towel roll) (1 for each station)
- Masking tape or sidewalk chalk

Savanna Competitors (Capture the Flag game)

- 2 "prey" items – flags with prey cut-outs or an animal figurine
- Rope, masking tape, or sidewalk chalk
- Worksheet #8: *African Cat Athlete Award Certificates* – one for each student

SET UP**Lion's Leap**

- Make copies and cut out the Lion's Leap Paws-a-gram page so that there is one paw print for each student.
- Set this activity up in a large open space, preferably outdoors (a grassy field, basketball court, or recess yard work best).
- Use masking tape or chalk to mark a starting line on the ground. From this starting line, use a measuring tape to mark off each foot up to 20 feet (the distance a lion can leap horizontally).
- Label each tick mark to make reading measurements easier during the activity.

(continued on the next page)



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CATS**

LESSON

2

activity
one

Tools for Survival: African Cat Adaptations

CAN YOU BECOME AN AFRICAN CAT OLYMPIAN? (2 of 4)

Cheetah Relay Race

- Use a large open space, preferably outdoors (a grassy field, basketball court, or recess yard work best).
- For a class of 30, set up 5 stations. Use masking tape or chalk to mark a starting line and a return line for each station.
- Use masking tape or sidewalk chalk to create a "balancing line" between the start and return points at each station.
- Place the following items in a box at each starting line:
 - Sunglasses
 - Spotted t-shirt or coat
 - Sneakers/soccer cleats
- After set-up is complete, the field should look similar to the field diagram below.

Savanna Competitors (Capture the Flag game)

- Use a large open space, preferably outdoors (a grassy field, basketball court, or school yard work best).
- Use rope, masking tape, or sidewalk chalk to mark a dividing line between opposite ends of the field.
- Decorate two flags: one with images of a lion's prey (zebra, giraffe, warthog, etc.), and the other with images of a cheetah's prey (Thomson's gazelle, helmeted guinea fowl, springbok, etc).
- Print out and personalize the *African Cat Athlete Award Certificate* for each student.



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Tools for Survival: African Cat Adaptations

CAN YOU BECOME AN AFRICAN CAT OLYMPIAN? (3 of 4)

Procedures

Introduction

1. Introduce students to the term **adaptation**. Have students brainstorm a list of adaptations that help animals survive. *They may list physical adaptations such as powerful legs, webbed feet, or large wings. They may list behavioral adaptations as well, such as caring for young or a lion's roar.*
2. Ask students the following questions to encourage them to draw their own conclusions about adaptations before beginning the activity:
 - Explain in your own words why adaptations are important. *Both physical and behavioral adaptations can offer protection from predators, allow animals to access food more easily, or help them camouflage in their surroundings.*
 - What adaptations do people have to help them survive? Create a T-gram to compare animals to humans. *Lungs, legs, skin, eyes, ears, hair, arms, hands, thumbs, nose, the five senses, and our family groups are all examples that the students may list.*
 - What are some adaptations that lions and cheetahs might have that help them survive? *For a list of lion and cheetah adaptations, refer to the Educator's Background Information for this section.*
3. Introduce the terms **predator** and **prey**. Have students list and categorize examples of predators and prey on the African savanna. Ask students where lions and cheetahs fit into these categories.
 - Create connections by asking students how and why adaptations are important to predators like lions and cheetahs.
4. After completing the class discussion, inform students they will have the opportunity to test their skills against the adaptations of a lion and a cheetah in the African Cat Olympics.

Lion's Leap

1. In this activity, they will be testing how far they can leap compared to a lion.
2. First ask students to predict how far they think a lion can leap.
3. Then, have the class line up single file at the start line.

Instruct the first student in line to stand upright in a stationary position with both feet on the starting line.

4. Have each student jump as far as they can, one at a time. Record the distance they jumped on their *Lion's Leap Paws*.
5. Next, have the student continue to jump, each time from a stationary position, until they reach the 20 foot tick mark. Record the number of jumps it took for the student to reach the end of the line.

Cheetah Relay Race

1. Take the students outside into the field or area that you have safely prepared and carefully monitor their activity while outdoors. Be sure that the area and students are safe. For a class of 30, divide the class into five teams of six students.
2. For each team, have three students line up behind the "start" line and three students line up behind the "return" line.
3. Once all teams have assembled, explain the following steps of the relay race:
 - a. To begin the race, the first person at the "start" line (student #1) must put on sunglasses and cross the field, walking the straight line with one foot in front of the other. Once they reach the "return" line, they must raise their "paws" and chirp like a cheetah to signal the person at the "return" line (student #2) to go. Student #2 must take the glasses and walk the straight line back to the "start" line.
 - b. Student #2 raises their "paws" and chirps to signal student #3 to go. Student #3 must put on the spotted t-shirt and do a "cheetah crouch" to cross the field (both hands and feet touching the ground). Once they reach the "return" line, student #3 passes the spotted t-shirt to student #4, who puts the t-shirt on over their own clothes, and signals them to cross the field also doing a "cheetah crouch".
 - c. When student #4 reaches the "start" line, they signal student #5 by picking up the baton from the supply box and chirping as they hand it off. Student #5 must put on the tennis shoes/soccer cleats and race across the field to student #6. Once there, they should pass off the shoes and baton with a chirp, signaling student #6 to cross the field one last time. When student #6 crosses the "start" line, the relay race is complete.

Tools for Survival: African Cat Adaptations

CAN YOU BECOME AN AFRICAN CAT OLYMPIAN? (4 of 4)

- The objective of the game is to successfully complete all steps of the relay race in the least amount of time. The first team to bring student #6 across the "start" line will be declared the winner.

Savanna Competitors (Capture the Flag game)

- Now tell students they will test their skills as either a lion or a cheetah by playing a game where they will compete, as lions or cheetahs, for space and food.
- Ensure the safety of students by preparing an outside field or area and monitoring their activity. Divide the class into two teams, lions and cheetahs.
- Each team has its own home range, divided by the line down the middle of the field. Students are free to move around their home range, but are in danger if they cross into the other team's home range. If a cheetah crosses into lion home range they may be captured and vice versa.
- Have both teams assemble at the dividing line but within their own home range. Choose a team leader for each side and give them their prey item.
- On a signal, the team leader sets their prey item near the end of field. The prey item must be visible to the other team. Players may guard their prey item but cannot touch or hold onto the prey item while guarding it.
- Once the team leaders have placed their prey item, another signal is given for the start of the game. Students can then enter the other team's home range in an attempt to steal the prey item. Once on the other team's home range, however, students are at risk of being tagged out. Once a player is tagged out, they are out for the rest of the game and may sit near the side of the field.
- To win the game, a team must capture the prey item and bring it back into their home range without being tagged. If neither side catches the enemy's prey item within a set time limit (15-20 minutes), the team with the most

individuals left in the game is declared the winner.

Wrap-up

Use the discussion points below to review the purpose of the African Cat Olympics with your students:

- Describe the lion and cheetah adaptations you used in each of the Olympic "events". Conclude how these adaptations are useful for life on the savanna. *Students mimicked the lion's ability to leap, and the cheetah's claws, black under-eye marks, long tail for balance, and speed. All of these are useful because they help lions and cheetahs catch prey and fulfill their role as top predators on the savanna.*
- Thinking about the Savanna Competitors game, explain how home range and population size affect lions and cheetahs in the wild. *Both lions and cheetahs require a large home range. This means that each individual or group of individuals needs ample space to roam. The larger the lion and cheetah population, the more space that is required. If the population increases but the space stays the same or decreases, this causes competition between individuals and species.*
- Imagine you are a cheetah on the savanna. How does the presence of a lion pride in your home range affect you? *Cheetahs would typically rather flee than fight. Because of this, the presence of a lion pride would likely force the cheetah to move elsewhere.*

African cats such as lions and cheetahs have unique physical adaptations that make them top predators in their environment.

Evaluation

To evaluate student comprehension, have students correctly answer the corresponding lesson questions on the *Big Ideas for Big Cats* card and then place it on the bulletin board in its proper location.



Tools for Survival: African Cat Adaptations

LION'S LEAP PAWS-A-GRAM

**LIONS CAN LEAP 20 FEET IN ONE JUMP!**

I leaped _____ feet in one jump.

It took _____ jumps to reach 20 feet.

TELL ALL YOUR FRIENDS HOW AMAZING LIONS ARE!**LIONS CAN LEAP 20 FEET IN ONE JUMP!**

I leaped _____ feet in one jump.

It took _____ jumps to reach 20 feet.

TELL ALL YOUR FRIENDS HOW AMAZING LIONS ARE!**LIONS CAN LEAP 20 FEET IN ONE JUMP!**

I leaped _____ feet in one jump.

It took _____ jumps to reach 20 feet.

TELL ALL YOUR FRIENDS HOW AMAZING LIONS ARE!**LIONS CAN LEAP 20 FEET IN ONE JUMP!**

I leaped _____ feet in one jump.

It took _____ jumps to reach 20 feet.

TELL ALL YOUR FRIENDS HOW AMAZING LIONS ARE!

AFRICAN CAT ATHLETE AWARD CERTIFICATE

NAME _____

HAS EARNED THIS CERTIFICATE FOR BECOMING AN:

AFRICAN CAT ATHLETE

AS PART OF THE

OFFICIAL AFRICAN CAT OLYMPICS

DATE _____

SIGNATURE _____

As an honorary African cat,
be sure to tell all your friends
how amazing lions and cheetahs are!

THE AFRICAN SAVANNA

HOME TO AFRICA'S LIONS AND CHEETAHS

Educator's Background Information

The African savanna conjures up images of one of 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 coral 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

- Carrion → 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: 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 gazelles and warthogs. Tall grasses also provide cover for snakes, lizards, and large birds like Kori bustard and guinea fowl. Scattered among and along the grassland edges, trees like the umbrella-shaped acacia and stout baobab provide browse for large antelopes, elephants, and giraffes, and food and protection for monkeys and baboons.

Rising from the vast grasslands, outcroppings of rocks known as kopjes (pronounced "ko-pees") stand out like rocky islands in a sea of grass. Kopjes consist of very old granite rock which has weathered and eroded, causing its surfaces to become broken and furrowed. These outcroppings provide shade and protection from fire, rain, sun, and predators. Many plants and animals, such as the brightly-colored agama lizard, rock hyrax, tiny klipspringer antelope, and aloe plants, use the savanna kopjes.

It's no surprise that with this many sources of prey, predators are abundant on the savanna. Many are both hunters and scavengers, and will steal food from each other when they have the opportunity.

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.

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. Termite 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 such as water, food, cover, and a place to raise young fluctuate naturally over time. As these components fluctuate, they directly impact animal populations within the habitat. An overabundance of resources can lead to flourishing animal populations. However, if resources decline, the health, stability, and density of the population is sure to follow. Limited resources can result in a "race for survival" with species competing against each other for food, water, and space.

The African Savanna

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.
- Split the class into small groups and pass out the food, water, and cover cards giving each group one. Tell students you need their help to match each habitat requirement to its appropriate category.
5. First hold up the examples of people. Ask students to use their knowledge of a human habitat to match each card to its 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

The African Savanna

WHAT'S IN A HABITAT? (2 of 2)

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.



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**AFRICAN
CATS**

The African Savanna

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.

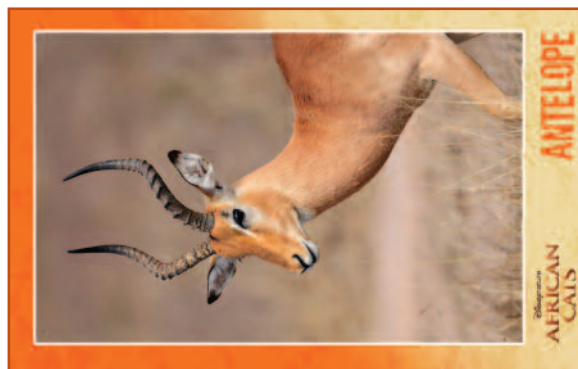
WHAT MAKES UP THE SAVANNA HABITAT?

PAGE 1

People Cards



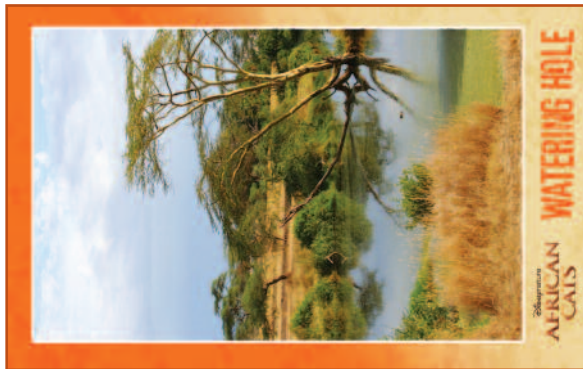
Food Cards



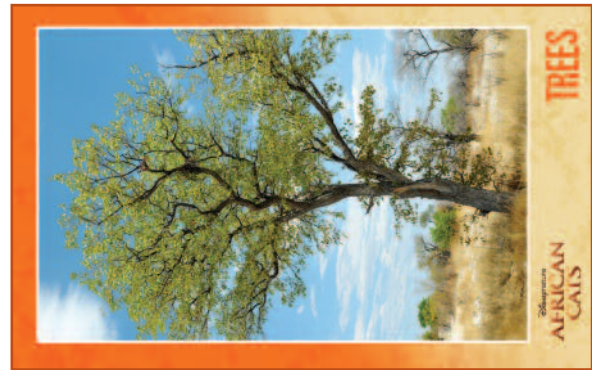
WHAT MAKES UP THE SAVANNA HABITAT?

PAGE 2

Water Cards



Cover Cards



The African Savanna

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.

The African Savanna

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

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.

- 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

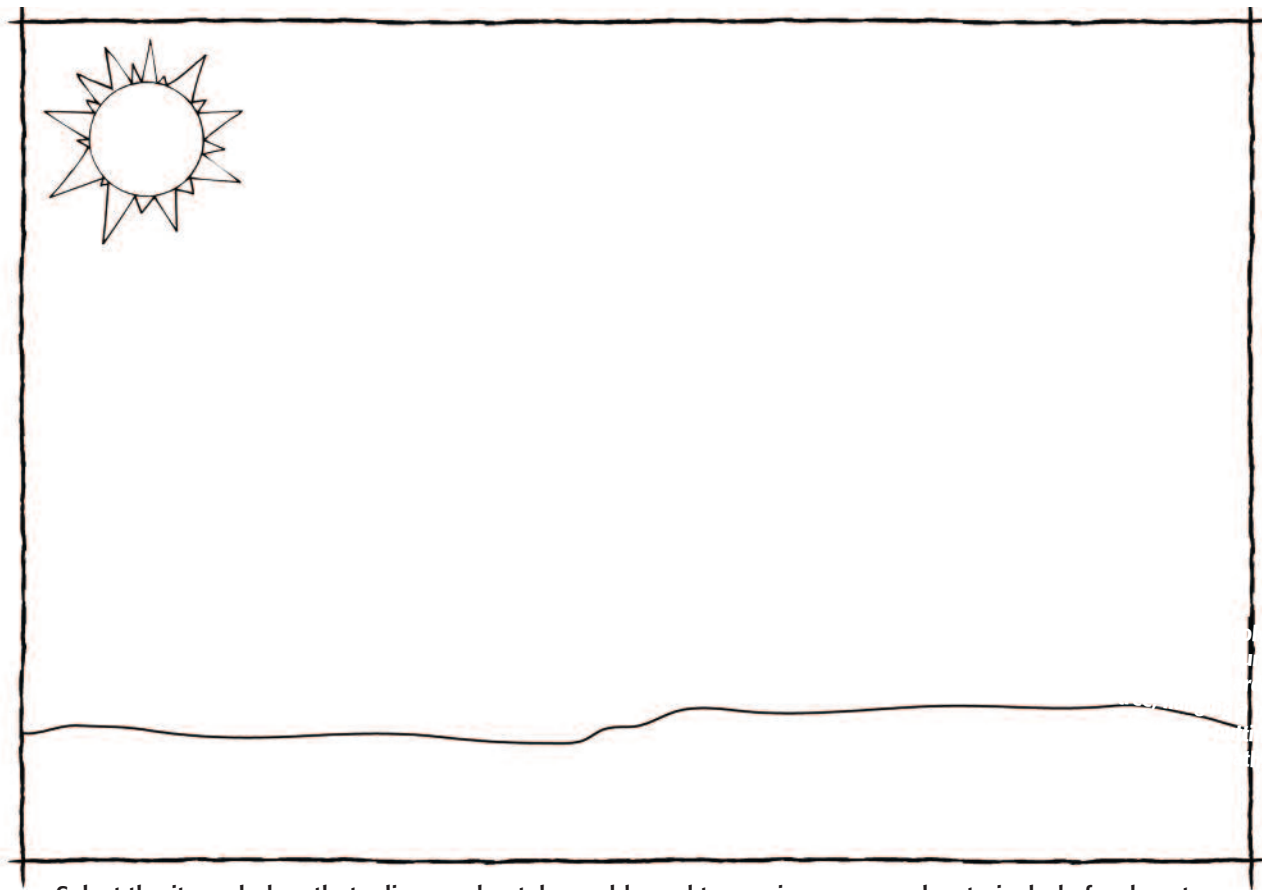
As an engaging way to evaluate student comprehension, have students correctly answer the corresponding lesson questions on the *Big Ideas for Big Cats* card and then place it in the proper location on the bulletin board.



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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



seaweed



antelope



trees



roller blades



short grass



river

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DATA SHEET FOR WHAT DO LIONS AND CHEETAHS NEED TO SURVIVE? GAME

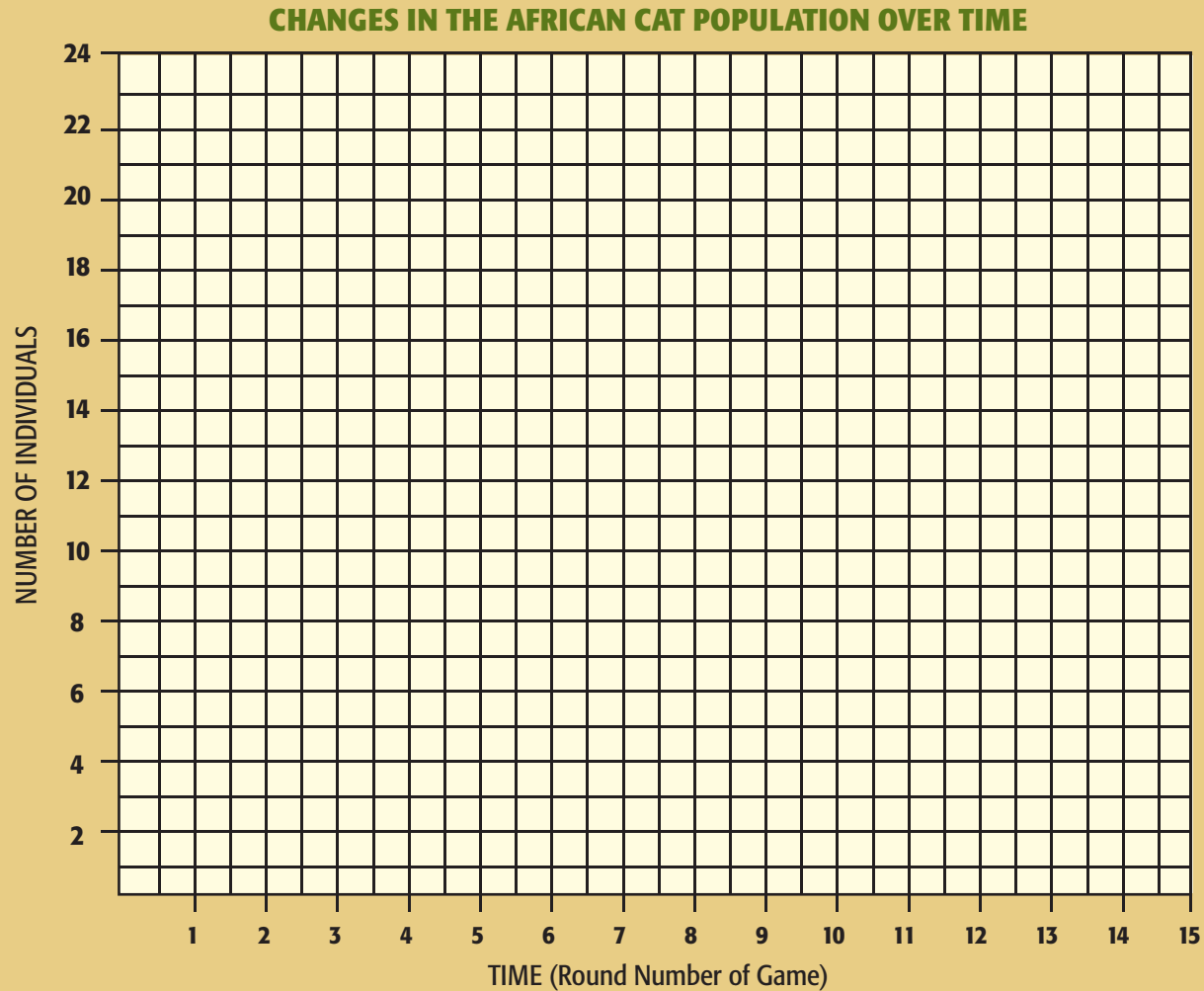
At the beginning of each round of play, record the number of surviving lions, cheetahs, and habitat elements in the table below.

	Number of Habitat Elements	Number of Lions	Number of Cheetahs
ROUND 1			
ROUND 2			
ROUND 3			
ROUND 4			
ROUND 5			
ROUND 6			
ROUND 7			
ROUND 8			
ROUND 9			
ROUND 10			
ROUND 11			
ROUND 12			
ROUND 13			
ROUND 14			
ROUND 15			

The African Savanna

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.

**KEY**

LIONS

CHEETAHS

HABITAT
ELEMENT

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

PREDATORS

LIFE AT THE TOP OF THE FOOD CHAIN

Educator's Background Information

Life at the Top starts with the Sun

Whether you are a human, lion, ant, or tree your food starts out as energy from the sun. Plants convert this energy directly into food in a process called photosynthesis. Plants are one of the few living things that can make their own 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**. The relationship between producers and consumers can be documented through food pyramids, food chains, and food webs.

Food pyramids show the energy transfer between different levels in a habitat. When a series of organisms are linked together in the order in which they feed on each other this is called a **food chain**. For example, a giraffe eats leaves from the acacia trees and then a lion may consume the giraffe. There are many food chains in a given area because some animals consume more than one kind of animal. This complex system of food chains in an area is called a **food web**.

Zebra, wildebeest, and Thomson's gazelle eat grasses and/or leaves from many different kinds of plants and in turn are eaten by many different predators, animals that hunt other animals such as cheetahs, lions, and hyenas. When the hunters and scavengers have finished with a carcass, **decomposers** such as bacteria, **fungi** (an organism such as a mushroom 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. Removing any organism in this complex web of life could have major impacts on other organisms, and ultimately, the ecosystem.

Examples of food chains on the savanna 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
- Carrion → 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 help students understand how plants and animals are balanced on the savanna. The food pyramid for these food chains is as follows (this is also the answer key for worksheet 25: *What does the savanna food pyramid look like?*).

Everything is Connected

Food webs are one way that all living things are interconnected. However, organisms may interact with one another in a variety of ways. Animals may compete for important resources like food, water, and space. **Herbivores** eat plants, which provide room for other plants to grow. **Carnivores** eat other animals which prevents them from overpopulating. Plants provide food for some animals, which in turn help plants by pollinating and dispersing seeds. Even after plants and animals die, they provide food for **decomposers**, such as millipedes, fungi, and bacteria. These release nutrients back into the environment, continuing the cycle of life. It's easy to see how removing any organism from this complex system could impact other organisms.

Predator and prey relationships are an important part of an ecosystem's food web. A **predator** is an organism that catches and eats other animals for food. A **prey** animal is one that is eaten for food. There are many examples of predator and prey relationships on the African savanna. Top predators

on the savanna include lions, cheetahs, leopards, and hyenas. These animals feed on diverse species including rodents, lizards, birds, zebra, a wide range of antelope (such as wildebeest and Thomson's gazelle), buffalo, and in some cases, juvenile rhinoceros and giraffe. Just like removing an organism from the habitat can be devastating, altering a predator and prey relationship can also have significant impacts.

We Need Predators

While many people fear lions, cheetahs, and other predators due to their meat-eating ways, the fact is we couldn't live without them! Predators keep herbivore populations healthy by removing sick and weak animals. Weeding out these individuals leads to stronger herds. Without predators, populations of prey species would grow too large and exceed their available food supply. This would lead to overgrazing, starvation, and disease that would eventually impact all species on the savanna.

Not only do lions and cheetahs play an important role in keeping prey populations balanced, but they also help neighboring human populations by attracting tourists. People from around the world travel to Africa to explore its parks and preserves, and lions and cheetahs are among their most popular and famous wildlife.

Savanna Predators: Meet the Competition

Cheetahs and lions aren't the only predators on the savanna. Other cat species like leopards, caracals, and servals, as well as species like hyena, painted dogs, and jackals call the savanna home. While their specific habitat preferences and behaviors differ, they often compete for food and home range.

African Painted Dog: With its blotchy coat, large round ears, long legs, and powerful jaws, the painted dog (or African wild dog) is only distantly related to the domestic dog. Like lions, painted dogs are very social and can travel in packs of up to 40 animals. Together, the pack looks after the young, old, or sick members. Like the cheetah they hunt by day, chasing down medium-sized antelope like impala as well as smaller prey like warthog. Also like cheetah, these shy predators prefer to avoid stronger predators, like hyena who often steal their prey.

Jackal: These small canines are both hunters and scavengers. While mostly nocturnal, they can sometimes be seen during the day as well. Working together as a pack they hunt small animals, such as rodents and hares, as well as birds and reptiles.

Spotted Hyena: Nocturnal, noisy, and highly intelligent, these animals are both scavengers and efficient hunters. They are commonly seen near lion kills or stealing prey from cheetahs, African painted dogs, and leopards. Thanks to living and hunting in packs led by a female pack leader, they are able to hunt large prey like zebra and wildebeest.

What's for Dinner?

Like you, lions and cheetahs have their favorite foods too!

Cheetahs primarily eat hooved mammals weighing less than 90 pounds, like gazelle, young kudu, and wildebeest. They will also hunt smaller animals like hares, warthogs, and birds.

By hunting together, lions are able to hunt large prey like wildebeest, zebra, buffalo, young elephant, rhino, hippo, and giraffe. Each of these can provide several meals for the pride. They'll also eat smaller animals like lizards, tortoises, warthogs, and even mice. Lions often take over prey hunted by hyenas, cheetahs, and leopards. In some areas like the Serengeti Plains, scavenged food makes up more than 50 percent of their diet.

African Cats: Hunting 101

Daytime Sprinter vs. Nighttime Heavyweights

Although both are predators, lions and cheetahs use very different strategies to hunt their prey.

Cheetahs

Cheetahs are among the best hunters. They are much more successful than other predators like lions, which catch their prey only about 30% of the time. The different steps of a cheetah hunt include:

Spotting Prey

Using their excellent vision, cheetahs stand on termite mounds or climb onto a low tree branch to scan the landscape for prey.

Closing In

Once a target is selected, the cheetah approaches the prey at a walk or slow run. Often it crouches to blend in with the grass and stalk an unsuspecting victim.

The Chase

Once the prey notices the cheetah, it takes off running, driving the cheetah into full speed. Since a cheetah can only keep up this speed for a short time, it must quickly get within striking distance before it has to rest.

The Trip

The cheetah swipes at the prey's hind legs using its front paw and strong dewclaw, tripping it and knocking it to the ground.

The Chokehold

Cheetahs suffocate their prey, by biting down on the throat and holding it tightly.

Taking a Break

Exhausted and in danger of overheating from the chase, the cheetah lays down for up to 30 minutes to recover before it eats. It is at this time when the cheetah's hard-earned meal is often stolen by other predators.

Time to Eat

Once it starts eating, the cheetah will eat as much and as quickly as possible before the local scavengers, like jackals and vultures, arrive and drive them away from their meal.

Lions

Lions hunt using stealth, power, and the cover of night. Two or more lions may hunt together or an entire pride may fan out and close in on an animal from all sides. Their hunting steps include:

The stalk and freeze

Using every available bit of cover, lions slowly stalk their prey alternately creeping and freezing. Younger members will sometimes drive a herd of prey animals towards the more experienced hunters waiting in ambush. Sometimes, one or more lions wait at a waterhole, and jump on unsuspecting animals coming in for a drink.

The rush and leap

Once a lion has selected an animal, it will make a final rush and leap on its prey. If the animal cannot be caught quickly, the lion usually tires and gives up. Often several individuals assist in bringing down an animal.

The Grab

Small prey are dispatched with a swipe of a paw, while larger animals are seized by the throat and suffocated.

The Meal

Once the hunt is over, the prey is dragged to a more secluded spot. If the pride males are present, they will often (but not always) hog the meal for themselves, eating as much as 75 pounds of food in a single meal! Once he is full, the females eat, and finally the cubs eat last. Lions have poor table manners and often fight over their food!

The Big Nap

After eating a large meal, lions may sleep up to 24 hours! The pride may take a break from activity for up to four days and not need to hunt for six days.

**Life's Tough at the Top:
Challenges Faced by Predators**

While life as a top predator may seem easy, life is tough at the top! Finding food, competing with other predators, and avoiding humans are just some of the challenges that lions and cheetahs face every day.

Predator Problems

Due to their shy nature, cheetahs are often pushed out of protected parks and reserves – areas where other predator populations are on the increase. Unable to compete for home range and prey, they move onto unprotected “marginal” farmlands located between park boundaries and settlements. Here they are sometimes killed by farmers concerned that the cheetah may harm their livestock.

People vs. Predators

Today, humans are the greatest threat to both lions and cheetahs. As daytime hunters, cheetahs are more likely to be seen by farmers and thus blamed, trapped, and killed.

Humans are the biggest threat to lions as well. Until recently scientists believed there were 100,000–200,000 lions living in Africa. But recent studies have found that their numbers have dropped dramatically to about 23,000. Most of these live in protected national parks. Currently the most serious threat to lions is the widespread use of poisons. Farmers use these to kill lions and prevent them from eating livestock.



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Predators: Life at the Top of the Food Chain

HOW DOES ENERGY FLOW ON THE AFRICAN SAVANNA?

Grade: **2-3** | Length of Activity: **1 hour** | Subjects: **Science** | Staff: **One teacher or volunteer**

DESCRIPTION

Students will discover how energy flows to and from living things on the African savanna. They will wear a picture of a savanna plant or animal and participate in a meet-and-greet activity to introduce themselves to one another. They will then create a food pyramid to show how energy flows between organisms on the savanna. Every living thing on the African savanna is connected and dependent on others for survival.

OBJECTIVES

Through participation in this activity students will:

- Identify at least two plants and two animals from the African savanna.
- Understand and be able to correctly apply the terms **producer**, **consumer**, **scavenger**, **decomposer**, and **food pyramid**.
- Demonstrate their understanding of energy flow in the savanna by creating a **food pyramid** to show how wildlife is connected.

POSITIVE ACTIONS TO HELP AFRICAN CATS

Spend time in your backyard, schoolyard, or neighborhood park. Observe two examples of a predator-prey relationship and learn more about them.

MATERIALS

- Worksheet 22-24: *Who lives on the African savanna?* – activity sheet
- Worksheet 25: *What does the savanna food pyramid look like?* – activity sheet

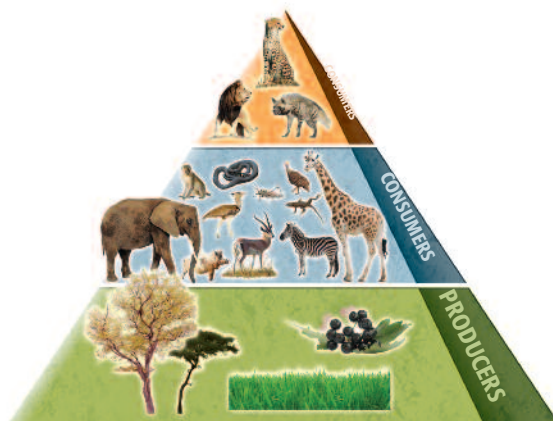
SET UP

- Make copies of the *Who lives on the African savanna?* worksheet for each student.
- Make copies of the *What does a savanna food pyramid look like?* worksheet for each student. The answer key is found below.

WHAT DOES A SAVANNA FOOD PYRAMID LOOK LIKE?

ANSWER KEY

Wildlife on the African savanna is connected. Plants, grasses, leaves, fruits, and trees are food for many animals. Many animals that eat plants are also food, or **prey**, for other animals called **predators**. Each level of the pyramid depends on the one below it to survive.



SCAVENGERS AND DECOMPOSERS

With the help of your teacher and classmates, fill in the pyramid. Anything that is not a producer or consumer can be put into the circle labeled "scavengers and decomposers." Use the wildlife you earned about during the meet-and-greet game.

Predators: Life at the Top of the Food Chain

HOW DOES ENERGY FLOW ON THE AFRICAN SAVANNA? (2 of 3)

Procedures

Who Lives on the African Savanna? Game*

1. Brainstorm with the class and list animals that live on the African savanna. Use the cards from worksheets 27-31 to show students pictures of some of the animals they named.
2. Discuss with students where wild animals find food, water, cover, and a place to raise their young (their habitat). Help students build on their existing knowledge of the African savanna by asking them to give examples of how living things on the savanna are connected.
One example could be: cheetahs eat gazelles. The dung from the gazelles adds nutrients to the soil. New grasses grow providing more food for the gazelles and thus food for the cheetah continuing the cycle. Students should conclude that all living things depend upon something else for their survival.
3. To demonstrate how living things are connected, students will be taking part in a meet-and-greet activity that will introduce them to the organisms that live on the African savanna. The purpose of this activity is to first identify their savanna "neighbors" before asking them to make connections about how these living things are related. The meet-and-greet activity will allow students to discover the different organisms found on the savanna and their role in the habitat.
4. Students wear a picture of one of these organisms and move throughout the classroom, introducing themselves to their African savanna neighbors. They should find the plants and animals they depend on. At the end of this activity, students will use their knowledge to construct an African savanna food pyramid.
5. Distribute worksheet 22-24: *Who lives on the African savanna?* and the picture card lanyards from worksheets 27-31, giving one to each student. Tell students to wear their picture around their neck. Depending on class size, you should have these species (see chart at right).
6. Give students 15-20 minutes to move around the classroom and mingle – meeting every member of the African savanna. As students meet new savanna neighbors, they should fill out their worksheet to identify the role of each organism in the environment.
7. When students have completed their worksheet, ask them the following questions:

- a. What types of organisms did you meet on the African savanna? How do these compare to the list you made at the beginning of this activity?
- b. What types of organisms did you meet the most often?
Students should say grasses and trees. Discuss why there would be more of these living things than anything else on the savanna.

What Does a Savanna Food Pyramid Look Like?*

1. After playing the *Who lives on the African savanna?* game, distribute worksheet 25: *What does a savanna food pyramid look like?* to the class. Explain that a **food pyramid** is a way to show what animals live in a habitat and how energy is transferred between them.

	For a Class of 20 Students:	For a Class of 30 Students:
sun	1	1
grass	4	5
acacia tree	2	3
fungus	1	1
fruit	0	1
termites (mound of termites)	1	1
grasshopper	0	2
agama lizard	1	1
olive grass snake	1	1
dung beetle	1	2
vervet monkey	0	1
olive baboon	1	1
kori bustard	1	1
guinea fowl	0	1
warthog	0	1
Thomson's gazelle	1	1
zebra	1	1
lappet faced vulture	1	1
elephant	1	1
spotted hyena	1	1
cheetah	1	1
lion (pride)	1	1

Predators: Life at the Top of the Food Chain

HOW DOES ENERGY FLOW ON THE AFRICAN SAVANNA? (3 of 3)

- Have students explain, in their own words, the roles of the **producer**, **consumer**, **scavenger**, and **decomposer** on the savanna. Using their worksheet from the previous activity, have students fill in their African savanna pyramid. Students can draw pictures, write in the names, or put tally marks so that there are the same number of living things as there are students that represent them (so if there are three students acting as trees, they should draw three trees; if there are two fungi, they should draw two fungi, etc.).
 - After assigning organisms to each of the categories, have students evaluate the importance of animals like scavengers and decomposers.
 - At the end of this activity, students will have a fully constructed food pyramid depicting energy transfer on the African savanna.
- Looking at the pyramid, decide which group of living things makes up the largest portion. Why do you think this is? *The producers (plants) make up the largest section of the pyramid. There must be more producers than consumers in a balanced ecosystem.*
 - Describe what would happen to the savanna habitat if the pyramid was reversed. *This would devastate the savanna habitat. If there were more top consumers than there were producers, there would not be enough food to go around.*
 - Predict whether the savanna would be a cleaner or dirtier place without scavengers and decomposers. Use your understanding of their role to justify your answer. *The savanna would be a dirtier place without things like vultures, dung beetles, and fungi. These organisms eat things that no one else wants to eat, like dung and dead animals, called carrion. Scavengers and decomposers are nature's recyclers and help return important nutrients to the environment.*

Wrap-up

Discuss findings with the class by using the following discussion points or asking the following questions:

- Explain what a food pyramid represents and the common characteristic(s) shared at each level of the pyramid. *A food pyramid diagrams energy flow between living things. Each level of the pyramid is divided by how the organisms in it get their energy (they make their own versus they eat other things).*

Every organism on the African savanna is connected and depends upon another for survival.

Evaluation

To evaluate student comprehension, have students correctly answer the corresponding lesson questions on the *Big Ideas for Big Cats* and place the card in the proper place on the bulletin board.



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**AFRICAN
CATS**

Predators: Life at the Top of the Food Chain

WHO LIVES ON THE AFRICAN SAVANNA?

PAGE 1

1. GRASS

CIRCLE ONE:
PRODUCER CONSUMER

What does grass depend on?

What eats grass?

2. TREE

CIRCLE ONE:
PRODUCER CONSUMER

What does a tree depend on?

What eats a tree?

3. LION

CIRCLE ONE:
PRODUCER CONSUMER

What does a lion eat?

What eats a lion?

4. DUNG BEETLE

CIRCLE ONE:
PRODUCER CONSUMER

What does a dung beetle eat?

What eats a dung beetle?

5. WARTHOG

CIRCLE ONE:
PRODUCER CONSUMER

What does a warthog eat?

What eats a warthog?

6. LIZARD

CIRCLE ONE:
PRODUCER CONSUMER

What does a lizard eat?

What eats a lizard?

7. VULTURE

CIRCLE ONE:
PRODUCER CONSUMER

What does a vulture eat?

What eats a vulture?

8. FUNGUS

CIRCLE ONE:
PRODUCER CONSUMER

What does fungus depend on?

What eats fungus?

Predators: Life at the Top of the Food Chain

WHO LIVES ON THE AFRICAN SAVANNA?

PAGE 2

9. CHEETAH

CIRCLE ONE:
PRODUCER CONSUMER

What does a cheetah eat?

What eats a cheetah?

10. TERMITE

CIRCLE ONE:
PRODUCER CONSUMER

What does a termite eat?

What eats a termite?

11. GAZELLE

CIRCLE ONE:
PRODUCER CONSUMER

What does a gazelle eat?

What eats a gazelle?

12. BABOON

CIRCLE ONE:
PRODUCER CONSUMER

What does a baboon eat?

What eats a baboon?

13. ELEPHANT

CIRCLE ONE:
PRODUCER CONSUMER

What does an elephant eat?

What eats an elephant?

14. SNAKE

CIRCLE ONE:
PRODUCER CONSUMER

What does a snake eat?

What eats a snake?

15. KORI BUSTARD

CIRCLE ONE:
PRODUCER CONSUMER

What does a kori bustard eat?

What eats a kori bustard?

16. ZEBRA

CIRCLE ONE:
PRODUCER CONSUMER

What does a zebra eat?

What eats a zebra?

Predators: Life at the Top of the Food Chain

WHO LIVES ON THE AFRICAN SAVANNA?

PAGE 3

17. HYENA

CIRCLE ONE:
PRODUCER CONSUMER

What does a hyena eat?

What eats a hyena?

18. GUINEA FOWL

CIRCLE ONE:
PRODUCER CONSUMER

What does a guinea fowl eat?

What eats a guinea fowl?

19. MONKEY

CIRCLE ONE:
PRODUCER CONSUMER

What does a monkey eat?

What eats a monkey?

20. GRASSHOPPER

CIRCLE ONE:
PRODUCER CONSUMER

What does a grasshopper eat?

What eats a grasshopper?

21. FRUIT

CIRCLE ONE:
PRODUCER CONSUMER

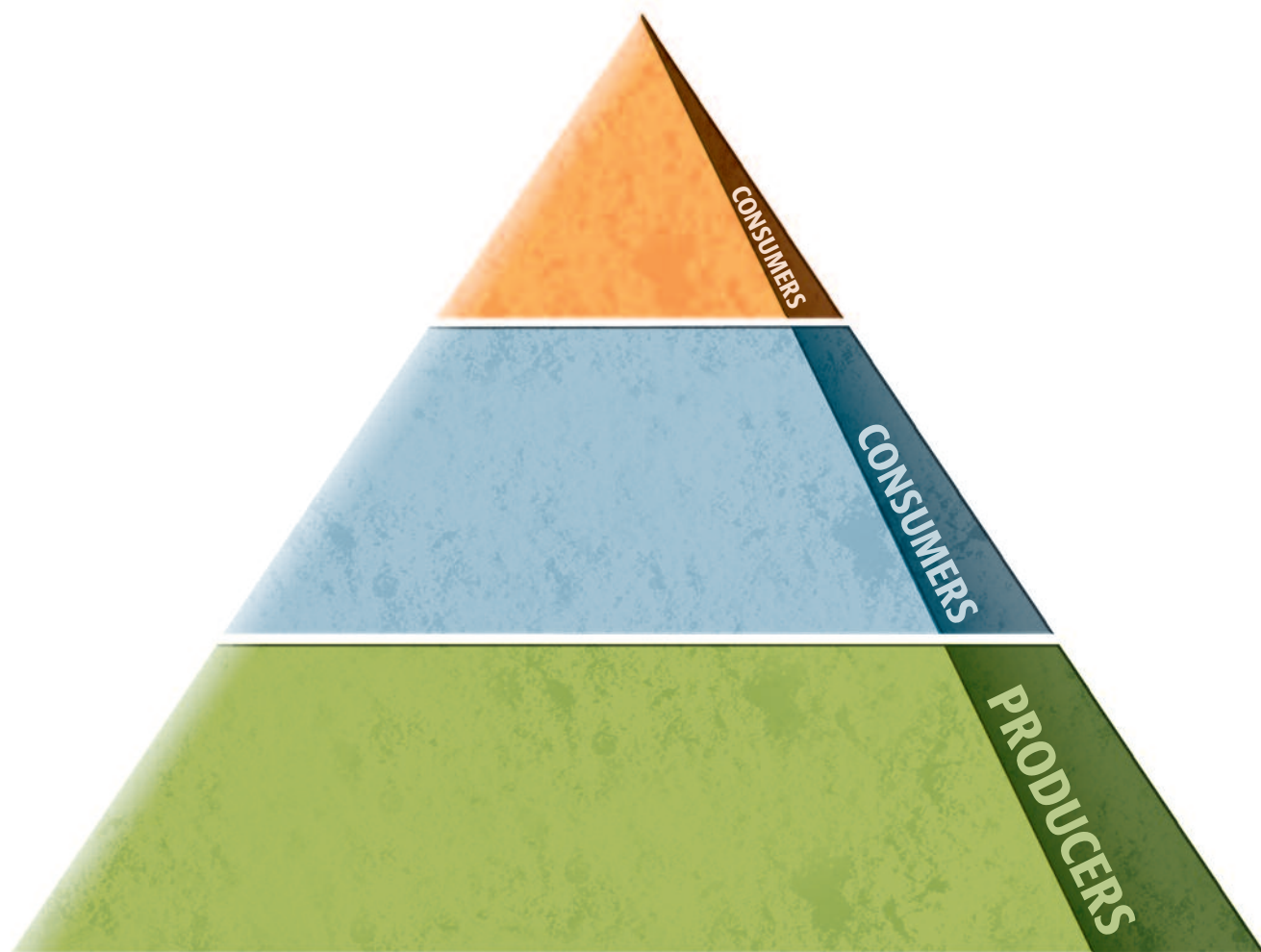
What does fruit depend on?

What eats fruit?

Predators: Life at the Top of the Food Chain

WHAT DOES A SAVANNA FOOD PYRAMID LOOK LIKE?

Wildlife on the African savanna is connected. Plants, grasses, leaves, fruits, and trees are food for many animals. Many animals that eat plants are also food, or **prey**, for other animals called **predators**. Each level of the pyramid depends on the one below it to survive.



SCAVENGERS
AND DECOMPOSERS

With the help of your teacher and classmates, fill in the pyramid. Anything that is not a producer or consumer can be put into the circle labeled "scavengers and decomposers." Use the wildlife you learned about during the meet-and-greet game.

WHO IS PART OF THE SAVANNA FOOD WEB?

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

DESCRIPTION

Students will discover how animals on the African savanna are connected by completing two activities. In the Savanna Meet & Greet activity, students will discover who lives in the savanna and how they depend upon one another. In the Web of Life activity, students create a living web of life model and discuss how every organism on the African savanna is connected and how they depend upon each other for survival.

OBJECTIVES

Through participation in this activity students will:

- Identify at least two plants and two animals that live on the African savanna.
- Understand the terms ***predator, prey, food chain, food web, carrion*** and ***fungus*** and apply these terms to the creation of a food web.
- After completing the Meet & Greet activity, identify at least two predator-prey relationships on the savanna.
- Create a living food web to demonstrate connections between wildlife on the savanna.

POSITIVE ACTIONS TO HELP AFRICAN CATS

Spend time in your backyard, schoolyard, or neighborhood park. Observe two examples of a predator-prey relationship and learn more about them.

MATERIALS

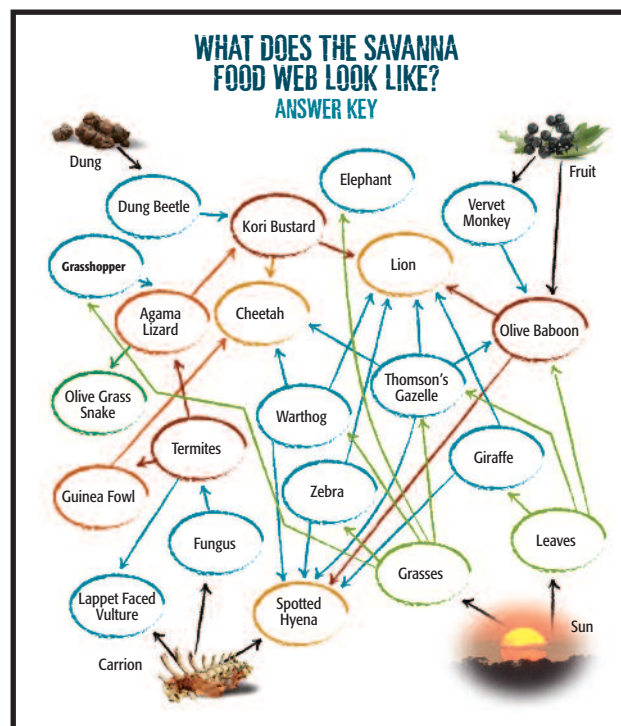
- Worksheets 22-24: *Who lives on the African savanna?* – activity sheet
- Worksheet 26: *What does the savanna food web look like?* – activity sheet
- Worksheets 27-31: *How is wildlife connected in a food web?* – 30 game cards
- Lanyard clips, string, or ribbon
- Ball of string or yarn
- Hole punch

SET UP

- Print and cut out the game cards from worksheets 27-31. Make these cards into lanyards by hole punching the top and attaching ribbon.
- Make copies of the *Who lives on the African savanna?* worksheet for each student.
- Make copies of the *What does a savanna food web look like?* worksheet for each student.

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.



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Predators: Life at the Top of the Food Chain

WHO IS PART OF THE SAVANNA FOOD WEB? (2 of 3)

Procedures

Who Lives on the African Savanna? A Meet & Greet Activity

1. Discuss the definitions of consumer, producer, predator, prey, herbivore, carnivore, and decomposer with the class.
2. Pass out pictures of savanna organisms and ask students to wear their picture. Also, each student should receive a *Who lives on the African savanna?* worksheet. Encourage students to move throughout the classroom, introducing themselves to students wearing pictures of other African savanna plants and animals and to fill in the worksheet as they meet and greet new organisms. Depending on class size, teachers can hand out the following species and numbers (see chart at right).
3. When the Meet & Greet activity is complete, have students return to their seats and distribute worksheet 26.

What Does a Savanna Food Web Look Like?*

1. Based on what students learned in the *Who lives on the African savanna?* activity, distribute worksheet 26: *What does a savanna food web look like?*. Allow time for students to fill in this savanna food web using the information they collected during the activity. Remind students that in a food web, the arrows point in the direction of energy flow (so from the energy source to the consumer).
2. At the end of this activity, students will have a fully constructed food web depicting energy transfer on the African savanna. They will use this knowledge to successfully complete the next activity.

How is Wildlife Connected in a Food Web?

1. Take the class outside to an open field or schoolyard. Be sure the outdoor area is a safe place and prepared for the students' use.

For a Class of
20
Students:

For a Class of
30
Students:

sun	1	1
grass	4	5
acacia tree	2	3
fungus	1	1
fruit	0	1
termites (mound of termites)	1	1
grasshopper	0	2
agama lizard	1	1
olive grass snake	1	1
dung beetle	1	2
vervet monkey	0	1
olive baboon	1	1
kori bustard	1	1
guinea fowl	0	1
warthog	0	1
Thomson's gazelle	1	1
zebra	1	1
lappet faced vulture	1	1
elephant	1	1
spotted hyena	1	1
cheetah	1	1
lion (pride)	1	1

2. Stand the class in a circle. Ask the student who has the sun card to stand in the middle.
3. The "sun" should hold the end of the string and name an organism in the circle that depends on it. They hold onto the end of the string and pass the ball of string to the student he or she named. The student that passes the ball of string should explain this connection (i.e. "*I am the sun. Grass depends on me to grow.*").
4. The next student repeats the activity by saying (i.e. "*I am grass. A Thomson's gazelle eats grass and depends on me for food.*"). Or, "*I am a Thomson's gazelle. I depend on the cheetah to keep my numbers in balance.*"). The web can go in either direction.
5. Students should continue passing the ball of string to other "living things" in the web, explaining their connections along the way.

When all students have finished the game, they should each be holding onto a piece of the string and be connected in a web of life.

6. Now present students with several scenarios:
 - a. A drought has occurred and there is no more grass. Have all the students that are grass continue to hold onto the yarn and sit down. Now any organisms that are linked to the grass and holding the yarn should sit down as well.
 - b. Lightning has struck nearby acacia trees. These trees have caught fire and burned. Have all of the trees sit down. Next have any animals connected to them sit down while still holding onto the yarn.

Predators: Life at the Top of the Food Chain

WHO IS PART OF THE SAVANNA FOOD WEB? (3 of 3)

7. Ask students what has happened?
8. Now present students with two more scenarios:
 - a. With the lightning has come rain, and the rains have provided water for new grass to grow. Have all the students who are grass stand up.
 - b. New grass means more food. Have all the animals that eat the grass stand up.
 - c. Now there is an abundance of prey (food) for other animals like lions, cheetahs, leopards, and hyenas. Have the rest of the class stand up so that everyone is standing again.

Wrap-up

Return to the classroom and use the discussion points and questions below to talk about these activities:

- Compare the organisms you “met” on the savanna to your original list. Discuss similarities and differences. *This is an open-ended question. All answers are acceptable.*
- Which organisms did you “meet” most often? Explain what this tells us about their role in the ecosystem. *Students should have encountered grass and trees the most. This is because they are examples of producers. There should be more producers than consumers in a balanced ecosystem.*
- Using the savanna food web, describe how plants and animals are connected to each other on the savanna. *Plants and animals depend on each other. Animals eat the plants for food, and the plants often depend on animals to spread seeds and help them re-grow.*

- What changes occur when organisms disappear from an ecosystem? *Many changes can occur and students will give a variety of answers. They should conclude that the disappearance of one organism can impact other organisms in an ecosystem.*
- Explain how organisms are affected by natural occurrences like drought and fire. *Drought and fire are natural occurrences that typically keep populations balanced. Although natural occurrences may cause damage to some populations, others, like certain grasses are dependent on fire for growth.*
- Use your knowledge of the savanna to make predictions about a habitat or ecosystem near your home. How do these organisms depend on each other? How are you connected to this habitat or ecosystem? *This is an open-ended question. All answers are acceptable.*

Students should conclude that every organism on the African savanna is connected and depends upon each other for survival.

Evaluation

To evaluate student comprehension, have students correctly answer the corresponding lesson questions on the *Big Ideas for Big Cats* cards and place it in the proper place on the bulletin board.

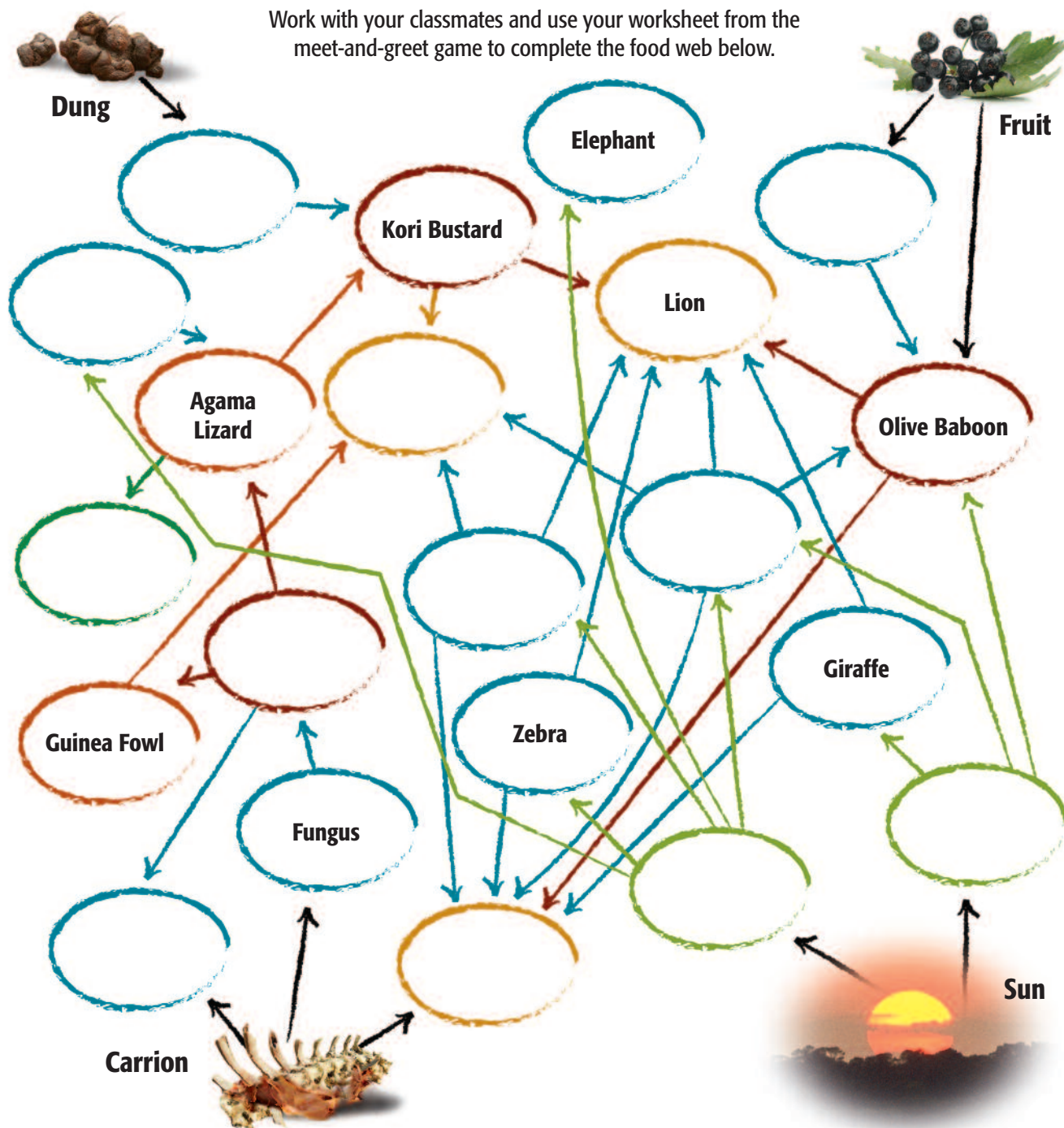
To demonstrate the students’ understanding of food webs, ask them to create a food web with animals near their school or a personal food web that involves what they eat in one day.



Predators: Life at the Top of the Food Chain

WHAT DOES THE SAVANNA FOOD WEB LOOK LIKE?

Work with your classmates and use your worksheet from the meet-and-greet game to complete the food web below.



Learn more about the African savanna by doing a school report on one of the animals listed in the food web.

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HOW IS WILDLIFE CONNECTED ON THE SAVANNA?

PAGE 1

Game Cards



TREE

I get my energy
from the sun.



TREE

I get my energy
from the sun.



TREE

I get my energy
from the sun.



SUN



GRASS

I get my energy
from the sun.



GRASS

I get my energy
from the sun.

HOW IS WILDLIFE CONNECTED
ON THE SAVANNA?

PAGE 2

Game Cards

**GRASS**

I get my energy
from the sun.

**GRASS**

I get my energy
from the sun.

**GRASS**

I get my energy
from the sun.

**CHEETAH**

I eat gazelles,
warhogs, and
Guinea fowl.

**GAZELLE**

I eat grass,
leaves, herbs,
buds and
shoots.

**LION PRIDE**

I eat antelope,
gazelle, buffalo
and zebras.

Predators: Life at the Top of the Food Chain

HOW IS WILDLIFE CONNECTED
ON THE SAVANNA?

PAGE 3

Game Cards

**WARTHOG**

I eat grass,
roots and fruit.

**MONKEY**

I eat leaves,
seeds, nuts
and fruit.

**BABOON**

I eat seeds,
plants, insects
and small
animals like
gazelles and
monkeys.

**ZEBRA**

I eat grass,
leaves and
brush.

**GRASSHOPPER**

I eat leaves
and grass.

**GRASSHOPPER**

I eat leaves
and grass.

Predators: Life at the Top of the Food Chain

HOW IS WILDLIFE CONNECTED
ON THE SAVANNA?

PAGE 4

Game Cards

**DUNG
BEETLE**

I eat dung and
decaying plants
and animals.

**DUNG
BEETLE**

I eat dung and
decaying plants
and animals.

**SNAKE**

I eat lizards.

**KORI
BUSTARD**

I eat insects,
reptiles, rodents,
carrion and
tree sap.

**FUNGUS**

I get my energy
from the
decaying plants
and animals.

**FRUIT**

I grow on
trees that get
their energy
from the sun.

HOW IS WILDLIFE CONNECTED
ON THE SAVANNA?

PAGE 5

Game Cards

**HYENA**

I eat wildebeests,
gazelles, zebras
and young
rhinos.

**ELEPHANT**

I eat grass,
woody plants
and some fruit.

**LIZARD**

I eat insects.

**TERMITES**

I eat plant
material and
fungus.

**VULTURE**

I eat carrion.

**GUINEA
FOWL**

I eat seeds
and insects.

Predators: Life at the Top of the Food Chain

WHO CAN SURVIVE ON THE AFRICAN SAVANNA?

Grade: **2–6** | Length of Activity: **1 hour** | Subjects: **Science, Graphing** | Staff: **One teacher or volunteer**

DESCRIPTION

This outdoor game works best after completing the predator-prey activities for either grade 2-3 or 4-6. Students will use interactive play to learn about predator-prey relationships in this twist on a classic game of freeze tag. After playing the game, students should conclude that predator species depend on prey for food, but prey species actually depend on the presence of predators to keep their populations healthy and in balance. The predator-prey relationship is a perfect example of all living things being connected.

OBJECTIVES:

Through participation in this activity students will:

- Use the terms **predator** and **prey** to complete the game.
- Describe how predators and prey interact within the savanna habitat.

POSITIVE ACTIONS TO HELP AFRICAN CATS

Spend time in your backyard, schoolyard, or neighborhood park. Observe two examples of a predator-prey relationship and learn more about them.

MATERIALS

- Outdoor space or open field for running
- Masking tape, sidewalk chalk, or rope
- Four rope circles or hula hoops
- 60 “food tokens” made from colored paper squares, soda bottle tops, or poker chips (enough for each student to have three – so for a class of 20, 60 “food tokens” are required)
- Colorful vests (orange safety vests work well) or “Predator Lanyards” made by attaching string to pictures of a lion, cheetah, hyena, and leopard. You will need one vest or lanyard for each predator – a class of 20 will require five predators; a class of 30 will require seven predators.

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.

SET UP

- Set up a large playing field by dividing it in half and using masking tape, rope, or sidewalk chalk to create two parallel lines approximately 50 feet apart (space can be made larger or smaller depending on class size and athletic ability). Designate one line “food” and the other line “cover.”
- Place the four rope circles or hula hoops randomly throughout the field in the large open space between the “food” and “cover” lines.
- Just prior to starting the game, place the food tokens on the other side of the food line, away from the open field. There should be enough tokens for each student to take three.

Procedures

1. Review the background information with your class. If this game is immediately following the *How is everything connected?* activity, only an abbreviated version of this information is needed.
2. Take students outside to the outdoor area you have prepared. Choose 5–7 students (depending on class size) to be predators. Have the students who are predators wear a “Predator Lanyard” or a colorful vest. The remainder of the class will be prey. Prey can wear one of the “food web” prey cards.
3. Explain the field to students. One end of the field is the “food source” and the other end of the field is the “cover.” Tell students that hoops in the middle of the field are “temporary cover.”
4. Prey should start at the “cover” side of the field. Their goal is to make it to the “food source” end of the field and recover three “food tokens” without being caught by a predator. Students can only take one token at a time, meaning they will have to cross the field three times. In order to “survive the savanna” students must return safely to the “shelter” side of the field with three food tokens before time is up.
5. In order to avoid being caught by a predator, prey have two options:
 - a. Prey can “freeze”, meaning they must remain motionless and cannot talk. Prey can remain frozen in place as long as they want but if they do not make it to the “shelter” side of the field with three food tokens then they will not survive the game. They may have escaped a predator, but they did not have food to eat.

Predators: Life at the Top of the Food Chain

WHO CAN SURVIVE ON THE AFRICAN SAVANNA? (2 of 2)

b. Prey can also run to a “temporary cover.” To be safe in a “temporary cover,” prey must have at least one foot inside the hoop. Again, there is no time limit to how long they stay in the hoop, but if the game is over and they have not made it to the “cover” side of the field with three tokens, they did not survive.

6. Predators should start anywhere in the open field between the “food” and “cover” lines. Predators must capture at least two prey in order to survive, but can only tag moving prey. Predators are not allowed to push down or tackle prey. Once a predator tags its prey, it must walk the prey to the sidelines before returning to the game.
7. Once all students understand the rules, signal the start of the game. The recommended time of play is five to seven minutes. After stopping each round of play, record the number of surviving predators and prey. Let everyone join back into the game and repeat the game four to five times, choosing new predators each round.

Wrap-up

After the game, bring students back to the classroom to wrap-up the lesson. Use the following discussion points to assess their understanding:

- Describe how the numbers of predators and prey changed with each round of the game. Explain how these changes made the game easier or more difficult for the predators and the prey. *As prey disappear, it should make it easier to catch more because the ratio between predator and prey should get smaller (there should be a more equal number of predators to prey). For students that are prey, they should find it makes it harder to escape predators when there are fewer individuals – remember the old adage: safety in numbers!*
- Explain how this game relates to the predator-prey relationships on the African savanna. *This is an open-ended question. Students may conclude that this activity is an*

excellent demonstration of how predator-prey relationships change over time. As the number of individuals in a species changes, this influences other species. For example, if there are more lions working together to hunt, they may have an easier time catching food. At the same time, if there is a very large group of zebra or gazelle, it may be harder for a single predator, like a cheetah, to catch even one of these animals.

- Create an argument for why predators and prey are equally important to the African savanna. *Answers will vary but should demonstrate students’ understanding of how both predators and prey are important to maintaining the balance on the African savanna.*

Extensions

- To encourage students to explore predator-prey relationships in more detail, try altering the game slightly. To demonstrate what happens when predator-prey populations are not in balance, reduce the number of predators. Play several rounds with fewer predators. Then, increase the number of predators. Play several rounds with more predators. Ask students to compare and contrast the difficulty in catching prey and escaping predators when there were more and less individuals.
- To show how food or habitat can be a limiting factor, reduce the amount of food tokens or temporary cover. This should make it harder for all prey animals to find food or cover. Ask students how this affected the outcome of the game.

Evaluation

- To evaluate student comprehension, have students correctly answer the *Big Ideas for Big Cats* question and place the card in its proper place on the bulletin board.

***Adapted from *Quick Frozen Critters*, a Project WILD activity.



BEHAVIORAL ADAPTATIONS

A DAY IN THE LIFE OF AN AFRICAN CAT

Educator's Background Information

Music filled the still night air. Somewhere out in the darkness of the African savanna, lions roared. First one, then another, and finally a third called forming a deep chorus. The pride members listened for a response from the neighboring pride. The deep voice of a male lion rose from the distance. Warnings, welcomes, territorial announcements, and declarations of pride strength and size were loudly broadcast through the darkness.

Vocalizing is just one of the many behaviors lions and cheetahs use to make their way in the world. The word **behavior** is used to describe an animal's natural habits and actions. Like physical adaptations, **behavioral adaptations** are designed to help individuals survive within their specific habitat. Both lions and cheetahs have behavioral adaptations specifically designed to help them survive life in their savanna home. Sleeping, hunting, finding water, and avoiding predators are just some of the survival behaviors that lions and cheetahs display every day. Others include:

Communication: Talking – African Cat style

Like you, cheetahs and lions communicate for a variety of reasons and in a variety of ways. While you talk, use hand signals, make a phone call, or send a text message, lions and cheetahs roar, chirp, scent mark, or claw trees to warn off adversaries, keep youngsters close by, find a mate, or strengthen family bonds. Here are some of the unique ways that lion and cheetahs communicate:

Vocalizations

While we are all familiar with a lion's roar, lions and cheetahs use a wide variety of sounds to communicate.

Cheetah Vocalizations Include:

- Purring: As with house cats and domestic cats, this sound indicates a friendly, contented mood. Sometimes it can also be a sign of nervousness.
- Chirping: Female cheetahs use this high-pitched bird-like chirp to call their cubs. It also serves as a greeting, but is reserved for family members.
- Stutter Call: This unique call is used by a male on the trail of a female. A female cheetah will also use it when telling her cubs to follow closely.

- Growling, Hissing: These aggressive sounds are used when defending themselves, their territory, or their young. At the same time, the cheetah may also lunge, slap the ground, and crouch to emphasize the point!
- Bleating: This sound expresses distress.
- Ihn-Ihn: This call alternates with chirping and is used by females to call their young.

Lion Vocalizations Include:

- Humming: Instead of purring, lions hum when they are content.
- Puffing: This sound (which sounds like a faint "pfft pfft") is made by lions when they approach each other with peaceable intentions.
- Woofing: This sound is made when a lion is startled.
- Grunting: This is used as a way of keeping in touch when the pride is on the move.
- Roaring: Both male and female lions roar. Females may roar to protect their cubs from an intruding male or to call nearby females to help defend their young. Resident males (those who live with a pride of females) are often seen roaring at night to advertise their location and strength to rival males, to communicate with pride members, warn off other males, or intimidate rival males during a fight. Male lions who are nomadic (traveling without a pride) seldom roar. Without the strength of a pride behind them, they prefer not to let their whereabouts be known. Sometimes an entire pride roars in chorus; this is a way to strengthen important social bonds. Thanks to the lion's sensitive hearing, they are able to discriminate the roars of large groups from small groups and the roars of companions from strangers.

Why Cheetahs Can't Roar and Lions Can't Purr

Only four cats can roar: the leopard, the jaguar, the tiger, and the lion. For this reason, they are all classified in the genus *Panthera*. Their secret is a two-piece hyoid bone in the throat; other cats have only one. But the rigidity of these bones prevents these larger cats from purring. Smaller cats like cheetahs, bobcats, lynx, cougars, caracals, servals, and domestic (house) cats vibrate their larynxes. This resonates their more flexible hyoid bone, allowing them to purr continuously while breathing in and out.

Other Types of Communication:

Body Language

Just like we use waving, smiling, and nodding to communicate, lions and cheetahs use body language to communicate as well. Face licking, and cheek rubbing are common greeting gestures. A threatening stiff-legged approach with the head below the shoulders sometimes followed by a charge clearly tells intruders to “go away!” Cheetah may also lunge, slap the ground, flatten their ears, and bare their teeth. This is alternated with crouching and open mouthed snarls to emphasize the point!

Scent Marking

If you have a pet dog or cat you may be familiar with this communication strategy. Both lions and cheetahs mark their territory by leaving urine and dung (poop) “calling cards” on the ground, in trees, on bushes, fences, and other objects. In addition to dung and urination, these cats sometimes scratch the ground or stand up and scratch tree trunks with their claws, similar to a house cat when it scratches the furniture. Why? Although these scrapes may simply be part of the claw-maintenance process, many researchers believe it is another way for these cats to announce their presence, since scent from the paws is left behind. Territorial boundaries can also be marked with saliva and secretions of cheek scent glands. What’s the advantage of all this fuss? By advertising their territorial boundaries, adult males and females scent mark and cheek mark to demonstrate their presence and give neighboring cats ample opportunity to avoid a life-threatening face-to-face encounter.

Playtrees: A Tree with a Unique Purpose

In Namibia and Botswana, cheetahs have been observed using “play trees” – large trees with low sloping branches to observe their surroundings and communicate with other cheetahs. In Namibia, where trees are scarce, cheetahs have been known to travel for days and pass through several farmlands to “post a message” on a play tree. These messages may be in the form of dung, urine, or claw marks. Other cheetahs inspect the markings to identify the cheetahs who have passed through the area.

Grooming

Like house cats, both lions and cheetahs groom the fur of others in their groups with their hard, rough tongues. This removes dirt and scabs and helps to strengthen bonds between individuals.

Sleeping, Hunting and Defending Territory: One Habitat, Two Different Lifestyles

While both lions and cheetahs are adapted for savanna living, their sleeping, hunting, and defense strategies are quite different.

Cheetah: Speedy, Solitary Daytime Hunters

Much more solitary than the highly social lion, cheetah females live alone except when they are raising cubs (which they raise on their own). In addition to caring for their cubs and protecting them from predators, females must also teach their cubs how to hunt and survive on their own. The female and her cubs separate when the cubs are about 18 months. The cubs usually stay together as a sibling group for another six months, perfecting their hunting and survival skills as a group. When they are two years old, female siblings leave the sibling group to look for a mate and raise cubs of their own. Male siblings may venture out on their own or stay with their brothers in a small permanent group or coalition. Both lone females and some male coalitions defend territories and fight fiercely with intruders. Unlike most animals, the female’s territory tends to be larger than the males in order to support the cubs.

Dependant on sight and speed for finding and hunting prey, cheetahs are diurnal, or active during the daytime, rather than nighttime like lions and most other wild cats. This allows the cheetah to make the most of the times when other predators are not active.

To avoid overheating while chasing prey, cheetahs prefer to hunt during the cooler parts of the day, like early morning, late afternoon, or early evening. Cheetahs can often be seen sitting on high points like termite mounds, where they can view potential prey or other predators. At night, cheetahs rest in secluded spots among thick shrubs or rocks. During the hottest part of the day, they rest in the shade. Preferring to avoid other predators rather than fight, they move on a regular basis to avoid being detected.

Lions: Powerful, Social Nighttime Predators

Unlike cheetahs and most other members of the cat family, lions are highly social animals that live in prides or family groups of 20–30 animals of different ages. The size of the pride depends on the amount of available food. Some prides include one male while others can include as many as four, usually brothers. Males are strongly territorial and challenge intruders, while lionesses fight off other females. Males often

fight until one lion is a clear winner. While the winner takes over dominance of the territory and of the pride, scientists say that on average a male lion only lives with a pride for about two to three years before being ousted by a stronger, often younger male. Unlike cheetahs, lions are nighttime (nocturnal) hunters and often hunt in groups. The female lionesses do most of the hunting for the pride.

Due to their large size and muscular build, lions generate a lot of heat. Just walking across an open plain can leave them panting! To help keep themselves cool, lions spend much of their day (up to 20 hours in some cases) sleeping or resting.

Family Life: Growing up African Cat Style

Playing, learning, eating, sleeping and interacting with family members. Sound familiar? Like you, lions and cheetah do a lot of growing and learning on their way to becoming adults.

Cheetahs:

The average litter size for a female cheetah is between four to five cubs, although anywhere from one to six is possible. Although cheetahs can give birth any time of year, the peak season is March through June. Cubs are grey and sport a mane of hair called a mantle that helps the cubs blend into the tall grass of the savanna. It also provides protection from sun and rain. Some scientists think it may also help them resemble a honey badger, which is a small, very aggressive animal that is usually left alone by predators. The mantle begins to disappear at around three months old.

During the first few weeks of life, the mother hides her cubs in thick underbrush and moves them often to avoid predators. Since she has to leave her cubs alone while she goes off to hunt, this is an especially dangerous time for the cubs. Many starve due to lack of prey, die of exposure, or are attacked by predators. In some parks with high predator populations, as many as 90% of the cubs die before reaching three months old. Cubs begin walking at three weeks and when cubs are about six weeks old, they begin to follow their mother around.

They stay with her for 18 months, while she teaches them hunting and survival skills. When the cubs are 18 months old, the mother and cubs separate. Siblings usually stay together as a group for another six months. At two years old, the female cubs, now young adults, go off to live on their own and search for a mate. Male siblings usually stay together for life in small groups or coalitions.

Lions:

Female lions usually give birth to a litter of between one to four cubs about every two years. Since they are born completely helpless, she keeps them hidden from other animals, including her own pride until they are about eight weeks old. In a pride, females often give birth around the same time (a process called synchronized birthing). Mothers of similarly aged cubs form a *crèche*, or nursery group, and remain together for one to two years. Crèche-mates will often nurse each other's cubs, though they give priority to their own offspring followed by the offspring of their closest relatives. Mothers of single cubs produce the same amount of milk as mothers of large litters, and therefore are the least resistant to nursing other cubs. The primary advantage of forming a crèche is that a group of females is better able to protect their young against coalitions, or groups of ousted male lions from other prides. When male lions locate a new pride, they fight the existing males for the pride. If they are successful, the new males eliminate any of the pride's cubs. Why? Mothers with cubs will not breed again until their cubs are 18 months old. Male lions are unwilling to spend that much time and energy caring for cubs that are not their own. Without cubs, though, the female lions are ready to mate within days. So eliminating the cubs ensures that the new male will be able to father a litter before he is pushed out of the pride by another, stronger male. Since males are typically 1½ times larger than females, a male can easily overpower a female. However, a crèche with at least two mothers can successfully protect at least some of their cubs against these outside invaders.

While females do all that they can to protect their cubs from invading males and other predators, they will abandon cubs if there is not enough food available. While this may seem harsh, it is more important for the future of the species and the pride that the female survives and has the opportunity to produce litters in the future when prey is more abundant.

Life Lessons

Like you, young cheetahs and lions, from about six weeks to 18 months old, "go to school" to learn how to get along in the world. Playing, observing adults, and exploring their savanna habitat help them learn the survival skills they need as adults.

Learning Through Play

Like many animals (including humans) young lions and cheetahs learn a lot through play. Stalking one another,

chasing, wrestling, and playing tug-of-war helps them develop strength and coordination. Tackling, tripping each other, and chasing small ground birds allows them to practice their hunting skills.

Young cheetahs also watch their mother hunt. At about nine months she begins bringing back live prey for them to chase under her supervision so they can perfect their timing and coordination.

For lions, hunting training begins around three months of age. Although cubs still nurse the young, the lionesses also take them to eat after a successful hunt. Just before a cub turns one, they begin to hunt prey. However, their skills are not perfected until they are about two or three years old. Unlike male cheetahs, the pride's resident males help care for the youngsters by protecting them from intruding lions and taking down prey that is too large for the mothers to catch. Although cubs will usually stay at a distance when they are small, older cubs sometimes approach and play with their fathers.

Growing up and Moving Out:

At around 18 months, when they have grown to sub-adults, cheetah cubs leave their mother. However, they stay together for up to six more months. At around 20–30 months, the females leave their littermates to search for suitable mates and start their own families. Like their mothers, they will

raise their families on their own without the help of a male. Males live alone or with their brothers in permanent groups called **coalitions** until they are about four years old. These groups may stay together for life, claim territories, hunt, and find mates together.

Lionesses take care of their cubs until the cubs reach two years of age. The pride then forces out the male cubs. Once on their own, they must either fend for themselves, form a coalition with other males (often from the same pride), or find another pride. Female cubs are allowed to stay with the pride and have cubs of their own. However, about one third of the females will leave to form new prides.

Scientists: Observing and Studying African Cat Lifestyles

How do we know so much about the daily lives of lions and cheetahs? Scientists study their daily activities by observing them in the field, tracking their movements through the use of radio collars, and photographing them using motion triggered cameras near feeding areas, play trees, and other areas frequented by these African cat species. They also observe and record their daily activities. From long term observations, scientists are able to design and use ethograms to ask and answer specific questions about African cats and their behaviors (for example, how long cubs stay with their mother and how they learn to hunt).



African Cat Behavioral Adaptations

HOW DO LIONS AND CHEETAHS
SPEND THEIR DAY?

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

DESCRIPTION

By completing an activity cycle and observing lion and cheetah behaviors, students will gain a better understanding of behavioral adaptations and the social structure of lions and cheetahs. Lions live in social groups called prides. Cheetahs live alone or in small groups. Although their behaviors and social structure may be different, both African cats are equally adapted to life on the savanna.

OBJECTIVES

Through participation in this activity students will:

- Create a daily activity cycle.
- Compare a daily activity cycle for lions to their own activity cycle.
- Examine African cat behaviors and understand their purpose.
- Identify five African cat behaviors using video clips.*
- Draw conclusions about how behavioral adaptations help lions and cheetahs survive in the wild.

POSITIVE ACTIONS TO HELP AFRICAN CATS

Learn more about African cats like lions and cheetahs by visiting websites or reading books listed in this guide.

MATERIALS

- Worksheet 37: *How do lions spend their time?*
– activity sheet
- Worksheet 38: *What African cat behaviors do you see?*
– activity sheet
- Video clips of lions and cheetahs in the wild
- Pencils or pens for each student

SET UP

- Make copies of worksheet 37: *How do lions spend their time?* for each student.
- Make copies of worksheet 38: *What African cat behaviors do you see?*
- Cue up the provided video clips on the computer or television screen.

Procedures

1. Discuss what they know about lion and cheetah behaviors. The following questions may be helpful in encouraging discussion:
 - a. How do you think a lion spends its day? What do you think it does most?
 - b. How do you think a cheetah spends its day? What do you think it does most?
 - c. Who do you think lions spend the most time with? How about cheetahs? Do these animals live alone or in groups?
2. Write their answers on the board. Tell students that they will now participate in an activity to learn about how lions spend their day.

3. First, distribute worksheet 37 to the class. Tell students that the top portion of this worksheet shows a typical day for a lion. The pie chart represents a lion's daily activity cycle. An activity cycle is a way for scientists to organize how an animal spends its day. Ask students the following questions:
 - a. Based on this pie chart, what does a lion spend most of its day doing? *Students should say resting.*
 - b. What does it spend the least amount of time doing? *Students should say playing and scent marking.*
 - c. Why do you think this is? *Students may have a variety of answers. Tell the class that lions rest often for several reasons. They are big, muscular animals and it takes a lot of energy to capture prey. When they aren't hunting, they usually rest to recover. It is also hot on the savanna, so less movement helps them escape the*

*LION BEHAVIOR: http://a.media.global.go.com/disneynature/africancats/downloads/video_lion_behavior.zip

*CHEETAH BEHAVIOR: http://a.media.global.go.com/disneynature/africancats/downloads/video_cheetah_behavior.zip

African Cat Behavioral Adaptations *cont'd*

HOW DO LIONS AND CHEETAHS SPEND THEIR DAY? (2 of 5)

heat. Finally, lions tend to eat large meals every few days. Resting helps conserve their energy making it less important to eat every day.

- d. Why do you think grooming and playing are important, even if lions do not do it as often? *Grooming is important because it helps lions stay clean. But, it also is a way to strengthen their bonds with each other – like us giving each other a high five or hug. Playing helps cubs practice their hunting skills. It also strengthens their bonds with each other.*
4. After discussing the lion activity cycle, tell students it is their turn to make their own activity cycle (4th graders may need extra help with this portion of the activity). Have them calculate how much time they spend doing the following things in a day:
- Resting/sleeping (any time a student is sitting quietly, napping or sleeping)
 - Traveling (any time a student is moving from one place to another – examples could be the time spent in a car or bus on the way to and from school, moving between classes and lunch, and the time spent traveling between the end of school and bedtime)
 - Eating
 - Playing (this could include unstructured play or time spent in sports, drama, music, or playing games – either board games or electronically)
 - School/homework (this includes the time students spend at school or completing homework)
 - Other (doing anything else that does not fit into one of the categories above)
5. After students have completed their activity cycle, ask them to compare it to the lion activity cycle. Use questions to engage students in a class discussion around similarities and differences between both cycles.
6. Tell students that now they are going to use their understanding of how a lion spends its day and decode the lion and cheetah behaviors they see. Using video clips, they will have to decide what behaviors they are observing and how much time is spent doing those behaviors.*
7. Review the background information with the class. Then, pass out Worksheet 38: *What African cat behaviors do you see?* and tell students that this is an example of an **ethogram**. Ethograms are a special list of behaviors that scientists use to record observations when studying animals in the wild. There are two ethograms; one for lions and one for cheetahs. Both have the same behaviors listed. Tell students that these are the behaviors they will be looking for when watching the video clips. Review each of the behaviors using the chart below:

BEHAVIOR	DESCRIPTION
<i>Resting</i>	<i>Inactive – laying still or sleeping</i>
<i>Walking</i>	<i>Traveling at a normal speed from one point to another</i>
<i>Stalking</i>	<i>Crouching low and/or following a prey species in the attempt to capture it for food</i>
<i>Capturing Prey</i>	<i>Chasing or taking down prey</i>
<i>Eating</i>	<i>In the process of ingesting food (biting, putting food in mouth, chewing)</i>
<i>Caring for Young</i>	<i>Nursing, feeding, grooming, or protecting cubs</i>
<i>Playing</i>	<i>Interacting with each other in a friendly manner (wrestling, chasing, pawing)</i>
<i>Scent Marking</i>	<i>Rubbing its face against an object, clawing a tree, or spraying an area with urine to mark territory</i>

8. Choose to divide the class into smaller groups to watch each video clip or show them to the entire class at once. Play the lion video clip first and have students record their observations. Be sure to mention that these observations should be done individually; students should not discuss or compare answers until the exercise is over.
9. After the class has viewed the lion clip, show students the cheetah clip. Have them record their observations on the ethogram without discussing or comparing their answers (you may choose to repeat the clips if students need more time to record behaviors).

*LION BEHAVIOR: http://a.media.global.go.com/disneynature/africancats/downloads/video_lion_behavior.zip

*CHEETAH BEHAVIOR: http://a.media.global.go.com/disneynature/africancats/downloads/video_cheetah_behavior.zip

African Cat Behavioral Adaptations *cont'd*

HOW DO LIONS AND CHEETAHS SPEND THEIR DAY? (3 of 5)

10. When presenting the behavior clips to the class, it may be helpful to have students watch each clip twice. To become familiar with the content first, students should watch the clip without making any marks on the worksheet. Then, students should watch the video clips for a second time while completing Worksheet 38: *What African Cat Behaviors Do You See?* This will allow students more time to successfully process and observe all of the big cat behaviors.
11. It is important to note that observing animal behaviors is not an easy task, even for experienced researchers! Therefore, students may have varying answers to Worksheet 38. After completing the activity, use the answer key to help guide students in their understanding of what behaviors were observed in each clip. Encourage students to draw conclusions around the complexities of recording and observing animal behavior. Class discussion could also serve as a preview to the next lesson by focusing on the use of technology (such as video equipment and recorded clips) as a useful tool for understanding big cat behavior.

Wrap-up

Use the discussion points and questions below to discuss their findings:

- Did your findings support the predictions you made about how lions and cheetahs spend their day at the beginning of this lesson? *This is an open ended question. All answers are acceptable.*
- Compare your daily activity cycle to the lion activity cycle. Explain any similarities and differences. *This is an open ended question. All answers are acceptable.*
- Using what you know about lion and cheetah behaviors hypothesize why lions and cheetahs would spend the majority of their time resting. *Lions and cheetahs are top predators – however, this means it often takes a lot of energy to catch and take down prey. As a result, after hunting or eating, lions and cheetahs rest. Also, the savanna can be very hot, so resting often helps these cats conserve energy and stay cool.*

- How are the behaviors listed in the ethogram used by African cats in the wild? *For detailed descriptions of African cat behaviors and how they are used in the wild, refer to the Educator's Background Information at the beginning of this section.*
- Make comparisons between African cat behaviors such as playing and scent marking to behaviors we use every day. *Answers will vary, but students' might equate scent marking to talking on the phone or sending an e-mail. Playing is similar to our play – it is good exercise, we can learn from play, and it can strengthen our friendships (social bonds) with others.*
After completing this activity cycle and observing lion and cheetah behaviors, students should have gained better understanding of behavioral adaptations and the social structure of lions and cheetahs.

Extensions

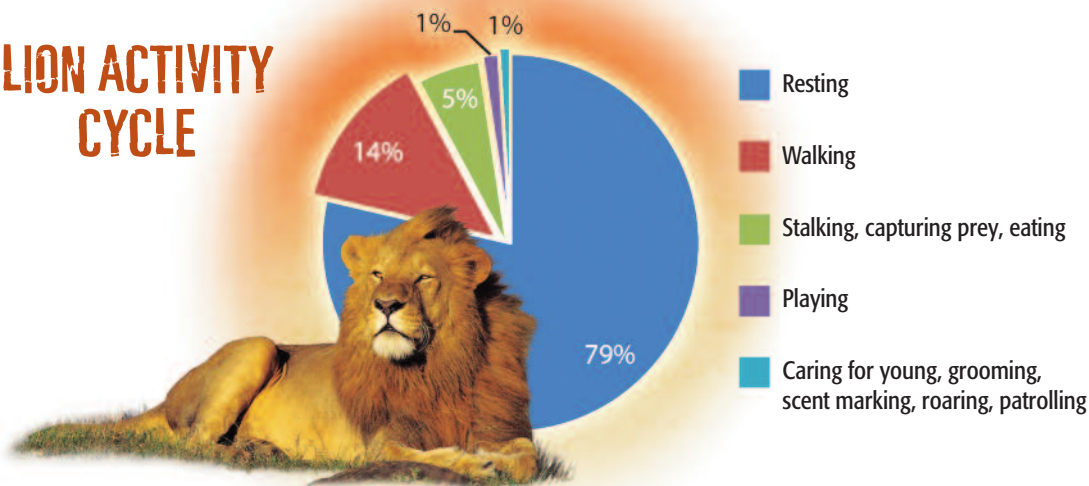
- Encourage students to create a backyard ethogram. Have students choose an animal near their schoolyard or neighborhood and create an ethogram with behaviors they would expect to see. Then, take the class outdoors to observe the animal they choose. Students should sit quietly and watch their animal for at least three minutes. Have them compare their animal's behaviors to the lion and cheetah behaviors they observed in the clip.
- Take students to a local park, nature center, or zoo and encourage them to observe animal behaviors at any of these locations using an ethogram (they may even be able to visit an AZA-accredited zoo with lions or cheetahs!). Then have the class compare the behaviors they observed to those of the lions and cheetahs in the video clips.

Evaluation

- To evaluate student comprehension, have students correctly answer the corresponding *Big Ideas for Big Cats* question card and place it on the bulletin board.

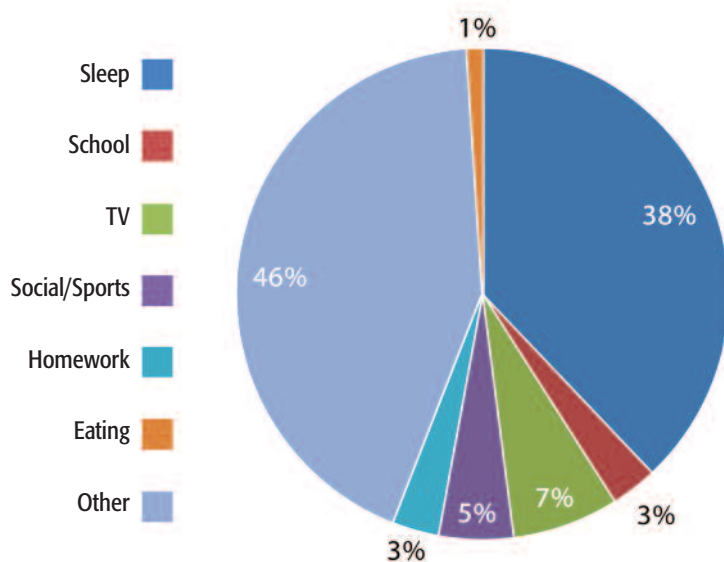
HOW DO LIONS SPEND THEIR TIME?

ANSWER KEY

LION ACTIVITY
CYCLE

Use the circle below to create your own activity cycle. How much time do you spend doing each of the listed activities? How does your activity compare to a lion's?

Below is a sample student activity cycle. Answers will vary for each student.

STUDENT
ACTIVITY CYCLE
(SAMPLE)

African Cat Behavioral Adaptations

HOW DO LIONS AND CHEETAHS SPEND THEIR DAY? (5 of 5)

WHAT AFRICAN CAT BEHAVIORS DO YOU SEE?

ANSWER KEY

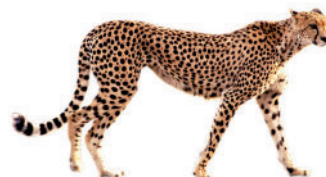
OBSERVING
LION BEHAVIOR

Researcher's Name _____

Date of Observation _____

Watch the provided video clips. As you see a lion do one of the things listed below, make a tally mark in the box that matches that behavior.

Type of Behavior	Number of Times the Behavior Occurs
RESTING	
WALKING	
STALKING	
CAPTURING PREY	
EATING	
CARING FOR YOUNG	
PLAYING	
SCENT MARKING	

OBSERVING
CHEETAH BEHAVIOR

Researcher's Name _____

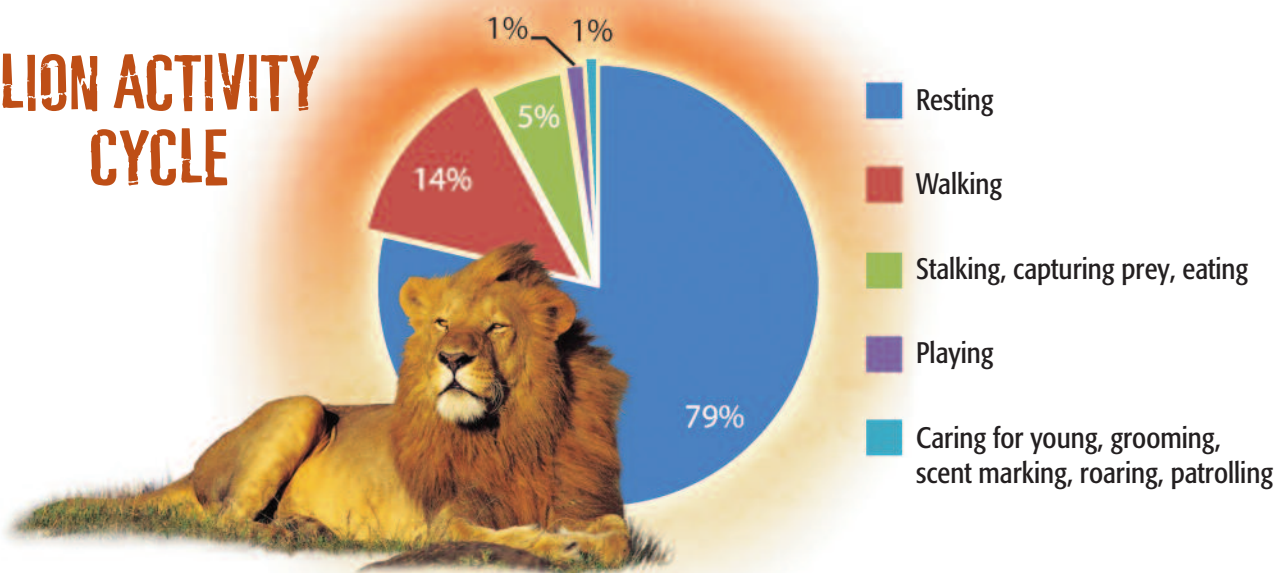
Date of Observation _____

Watch the provided video clips. As you see a cheetah do one of the things listed below, make a tally mark in the box that matches that behavior.

Type of Behavior	Number of Times the Behavior Occurs
RESTING	
WALKING	
STALKING	
CAPTURING PREY	
EATING	
CARING FOR YOUNG	
PLAYING	
SCENT MARKING	

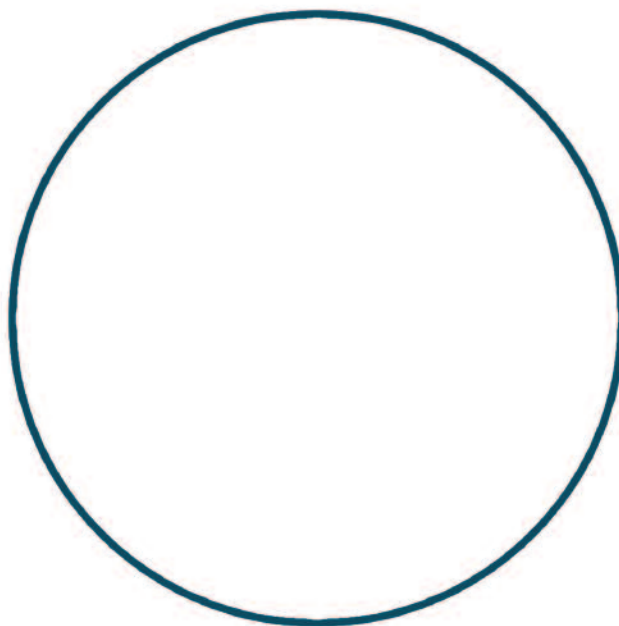
African Cat Behavioral Adaptations

HOW DO LIONS SPEND THEIR TIME?

LION ACTIVITY
CYCLE

Use the circle below to create your own activity cycle. How much time do you spend doing each of the listed activities? How does your activity compare to a lion's?

- Sleep ■
- School ■
- TV ■
- Social/Sports ■
- Homework ■
- Eating ■
- Other ■

STUDENT
ACTIVITY CYCLE

African Cat Behavioral Adaptations

WHAT AFRICAN CAT BEHAVIORS DO YOU SEE?

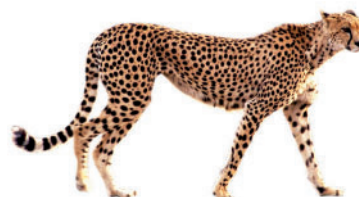
OBSERVING
LION BEHAVIOR

 Researcher's Name

 Date of Observation

Watch the provided video clips. As you see a lion do one of the things listed below, make a tally mark in the box that matches that behavior.

Type of Behavior	Number of Times the Behavior Occurs
RESTING	
WALKING	
STALKING	
CAPTURING PREY	
EATING	
CARING FOR YOUNG	
PLAYING	
SCENT MARKING	

OBSERVING
CHEETAH BEHAVIOR

 Researcher's Name

 Date of Observation

Watch the provided video clips. As you see a cheetah do one of the things listed below, make a tally mark in the box that matches that behavior.

Type of Behavior	Number of Times the Behavior Occurs
RESTING	
WALKING	
STALKING	
CAPTURING PREY	
EATING	
CARING FOR YOUNG	
PLAYING	
SCENT MARKING	

TOOLS OF CONSERVATION

HOT TOPIC

HOW RESEARCHERS STUDY LIONS AND CHEETAHS

Educator's Background Information:

Observing and Studying Behaviors

Scientific research is the first step towards protecting a species. Studying an animal's natural behaviors is an important part of this research. Identifying and understanding the daily activities and travel patterns of lions and cheetahs have helped scientists determine habitat needs, address human/wildlife conflict issues, and identify reasons for their decline.

Learning from Direct Observation

While lions and cheetahs can be difficult to watch up-close, much can be learned from directly observing behaviors. For instance, observing social grooming can give insight into social dynamics. Observing feeding and nursing behaviors provides clues to an animal's health and group structure. Watching a hunt offers insight into prey availability and potential conflicts with humans or other predators.

Seeing Spots: Identifying cheetahs and lions

To understand and track animal populations, scientists must be able to identify individual animals. Researchers use individual spot patterns on the face and chest and banding on the tail to identify cheetahs in the field. Lions are identified by looking at their "whisker spots" or patterns, as well as by body marks such as nicks and scars, that are unique to each lion.

Learning from Animal Evidence

In addition to direct observation, scientists can also learn a lot about an animal by what it leaves behind. Footprints or tracks, dung (poop), hair, drag marks (caused when lions and cheetahs drag their prey to more secluded feeding areas), and food remains help scientists learn about wildlife populations and give valuable insight into an animal's daily life. Due to the shy nature of cheetahs, this is one of the best ways to study cheetah populations and behaviors.

- **Dung:** Analyzing DNA in dung or hair can tell scientists a lot about wildlife without darting, capturing, or putting on a radio collar. Health, diet, location, age, gender, and reproductive status can all be determined by studying dung. In South Africa and Namibia, conservationists use specially trained "sniffer" dogs to locate cheetah dung.

- **Scent marks and claw marks:** The presence of scent marks can signal territorial boundaries and "high traffic" areas, like cheetah play trees. These are also good areas to set motion-sensor cameras called **camera traps**. Claw marks can also be a form of marking territory. Scratch marks on trees are a good indication that an African cat is in the area. In addition to providing a visual cue, claw marks also leave behind a cat's scent, since there are scent glands found within the foot pads.
- **Tracks, drag marks, and food remains:** These types of animal evidence can identify available prey species, give insight into scavenger/predator interactions, and help identify the size, location, age, makeup, and health of a pride or coalition.
- **Vocalizations:** Studying African cat vocalizations can help researchers decode group dynamics and relationships between individuals. For example, a lion may roar to call cubs, establish a territory, or communicate with the rest of its pride. A cheetah may chirp to call her cubs or greet family members. Identifying different types of vocal communication helps researchers better understand big cat behavior.

Putting it all together: Ethograms and Activity Cycles

Scientists develop an ethogram – or catalog of behaviors in an animal's daily activity cycle – that records how much time an animal spends on a given behavior. By better understanding an animal's daily activities (what they do, when and where they do it) scientists can better understand how to protect them.

Tools of the Trade

Finding elusive species like cheetahs and wide ranging species like lions isn't easy! Luckily, scientists have technology to assist them, including devices like these:

- **Motion-Sensor Cameras (Camera Traps):** These cameras are armed with infrared sensors that take pictures when they sense movement. **When placed near feeding sites and travel routes they help scientists identify travel patterns, natural behaviors, and population densities (the number of animals found in an area).** Because camera traps work in both day and night, can be mounted

The Tools of Conservation *cont'd*

at different heights, and operate automatically, they provide a wealth of information in the absence of people.

- **Tracking Devices:** The use of telemetry and Global Position System (GPS) tracking devices has revolutionized wildlife conservation. By receiving signals from specially fitted tracking collars placed on the animal, scientists can monitor the travels of lions, cheetahs, and other animals as they follow prey, avoid predators, and search for mates. In the process, scientists can learn critical information regarding habitat needs, travel patterns, and behaviors, including those that could lead to human/cat conflicts.

To see images of a lion wearing a GPS collar, visit:
<http://www.lionconservation.org/lion-monitoring.html>.



Camera traps like this one are mounted in a habitat to capture images in the absence of people.



Disneynature
**AFRICAN
CATS**

The Tools of Conservation

HOW DO RESEARCHERS STUDY AFRICAN CATS?

Setting: **Classroom** | Grade: **2–3** | Length of Activity: **1½ hours** | Subjects: **Science** | Staff: **One teacher or volunteer**

DESCRIPTION

Students will visit three stations to learn the various ways researchers study big cats in the wild and become a “Big Cat Researcher.” In order to protect lions and cheetahs in the wild, researchers must first work to understand their natural behaviors. Asking questions and collecting data on where and how these big cats spend their time gives researchers a better understanding of how to solve wildlife conservation issues.

OBJECTIVES

Through participation in this activity students will:

- Understand and apply the terms **research**, **scientific method**, and **wildlife researcher**.
- Identify which animals have passed through a habitat using a series of clues and a tracking guide.
- Use a footprint guide to match savanna animals to their footprints.
- Identify lion and cheetah vocalizations.

POSITIVE ACTIONS TO HELP AFRICAN CATS

You can be an animal researcher at home! Go outside and explore your backyard. Look for animal clues such as footprints, fur, feathers, or an animal home (webs, nests, and burrows are all fun to find).

MATERIALS

- Worksheet 39: *How do researchers study African cats?*
- Worksheet 40: *Who passed this way?* – images of clues left behind by lions
- Worksheet 41: *Animal tracking guide*
- Worksheet 42: *Who visited the waterhole?* – footprint silhouettes for students to identify
- *What’s all that noise?* – lion and cheetah vocalizations (Available at www.disney.com/africancats)
- Computer, recordable CDs and CD player, or MP3 player (headphones are helpful but not required)

SET UP

- Make copies of worksheet 39 and distribute to each student in the class. This will be their master data sheet. Students should take this worksheet with them to each of the research stations.
- Create three activity research stations within the classroom. You can duplicate stations if you’d like smaller working groups. The stations include:

Station 1: Who passed this way?

- Copy worksheet 40. Place at the *Who passed this way?* stations to identify clues of animals.

Station 2: Who visited the waterhole?

- Make a copy of worksheets 41 & 42. Place them at the *Who visited the waterhole?* “research stations.”

Station 3: What’s all that noise?

- Download the provided cheetah and lion sound clips and save them to the computer’s desktop or copy onto a CD or MP3 player.

Procedures

1. Students will use their scientific skills to become a Big Cat Researcher! Review the different methods that researchers use to study lions and cheetahs in the wild.
2. Students should move from station to station after analyzing the data and answering the questions found on the student worksheet.
3. Review the worksheet responses with students to assess their understanding of the content.

Wrap-up

Use the following questions to summarize the lesson.

1. What can researchers learn about animals by looking at clues? *What animals have visited a location, how many visited, their sizes, their health, vocalizations tell us about their behavior.*

2. Compare the clues from African cats to the clues that you might find near your home? *Animal calls, spider webs, footprints, feathers, insect molts, nests.*

Asking questions and collecting data on where and how these big cats spend their time gives researchers a better understanding of how to solve wildlife conservation issues.

Extensions

Students can practice being wildlife researchers in their schoolyard. In an area of the schoolyard without heavy foot traffic, have students smooth out a pile of sand on the ground. In the middle of the sand, place a rock or small log. On top of this rock, place a few drops of scented oil or spray (lavender oil, fish oil, clove oil, etc.) to attract animals. Let the rock and sand sit overnight. In the morning, check the sand for animal tracks. Using a field guide, identify and discuss your findings as a class.

HOW DO RESEARCHERS STUDY AFRICAN CATS? (2 of 2)

Evaluation

To evaluate student comprehension, have students correctly answer the corresponding lesson questions on the *Big Ideas for Big Cats* cards and place them in the proper order on the bulletin board.

Want to further your classroom conservation work? Visit **Disney.com/planetchallenge TODAY!**

**Worksheet 39 answer key:****HOW DO RESEARCHERS STUDY AFRICAN CATS?****Station 1: Who passed this way?****1. What four animal clues can you identify on the savanna?**

- 1) Footprints 2) Scat or dung (poop) 3) Leftover food (bones) 4) Scratch/claw marks

Describe what researchers can learn from each clue.

- Footprints tell researchers what animals passed by, how big the animals were (both size and age), how many there were, and what direction they were going.
- Scat tells researchers what an animal ate, if the animal is healthy, and can be tested to find out exactly what animal left it and if the animal is pregnant.
- Leftover food can tell researchers what animal has been there – an herbivore or carnivore. They can also tell from bite and scratch marks on the food what animal ate it.
- Scratch/claw marks are a good indication that an African cat has passed through an area. They are used to mark territory.

2. Animals also leave clues that we cannot see. What other clues could tell researchers that an animal is near? (Use all your senses.)

Other clues that an animal has been in the area are smells, such as scent markings, and sounds, such as vocalizations from the animal or other animals in the area. Animals might also leave behind fur, feathers, or hair that can be a clue as to what passed through.

3. Predict what animal passed this way? (Use all your clues.) Based on the clues, this animal is a lion. It cannot be a cheetah because the footprints do not have claw marks.**Station 2: Who visited the waterhole?****1. Using the animal tracking guide, determine what animals have visited the waterhole.**

- 1) Elephant 2) Rhinoceros 3) Giraffe 4) Zebra 5) Porcupine 6) Lion

2. What else can we learn from animal footprints? Footprints can tell researchers what animals passed by, how big the animals were (both size and age), how many there were, and what direction they were going.**3. Why do you think there are so many different footprints in this area?** Many animals come to the watering holes. On the savanna, especially in the dry season, water can be hard to find. Since every animal needs water, the watering hole is one place where almost all animals will visit, even if it is not at the same time.**Station 3: What's all that noise? See download links below.****1. Listen to the cat sounds. Identify which is the lion and which is the cheetah. Record your answers below.**

Sound 1: Lion Sound 2: Cheetah

2. Compare the lion and cheetah vocalizations. How are they different? The lion has a louder, more powerful voice. Lions roar, while cheetahs cannot. Cheetahs make a chirping noise, but cheetahs can purr and lions cannot. Both have many sounds they make to communicate with others.**3. Now watch the provided video clips of lions and cheetahs vocalizing. Why do you think vocalizations are important to lions and cheetahs?** Vocalizations are important to lions and cheetahs because they help them communicate on the savanna. Lions and cheetahs will use sounds to warn enemies, defend their territory, call their cubs, or talk to other family members. Just like people make sounds to communicate how they are feeling, lions and cheetahs use sounds to talk to other cats too!**4. How do researchers use vocalizations to study lions and cheetahs?** Researchers can learn a lot by listening to the sounds that lions and cheetahs make. Listening to sounds and comparing them to actions can help researchers better understand lion and cheetah behavior.

LION VOCALIZATION: http://a.media.global.go.com/disneynature/africancats/downloads/video_lion_vocalization.zip

CHEETAH VOCALIZATION: http://a.media.global.go.com/disneynature/africancats/downloads/video_cheetah_vocalization.zip



HOW DO RESEARCHERS STUDY AFRICAN CATS?

Station 1: Who passed this way?

1. What four animal clues can you identify on the savanna?

Describe what researchers can learn from each clue.

2. Animals also leave clues that we cannot see. What other clues could tell researchers that an animal is near? (Use all your senses.)

3. Predict what animal passed this way? (Use all your clues.)

Station 2: Who visited the waterhole?

1. Using the animal tracking guide, determine what animals have visited the waterhole.

2. What else can we learn from animal footprints?

3. Why do you think there are so many different footprints in this area?

Station 3: What's all that noise?

1. Listen to the cat sounds. Identify which is the lion and which is the cheetah. Record your answers below.

Sound 1: _____ Sound 2: _____

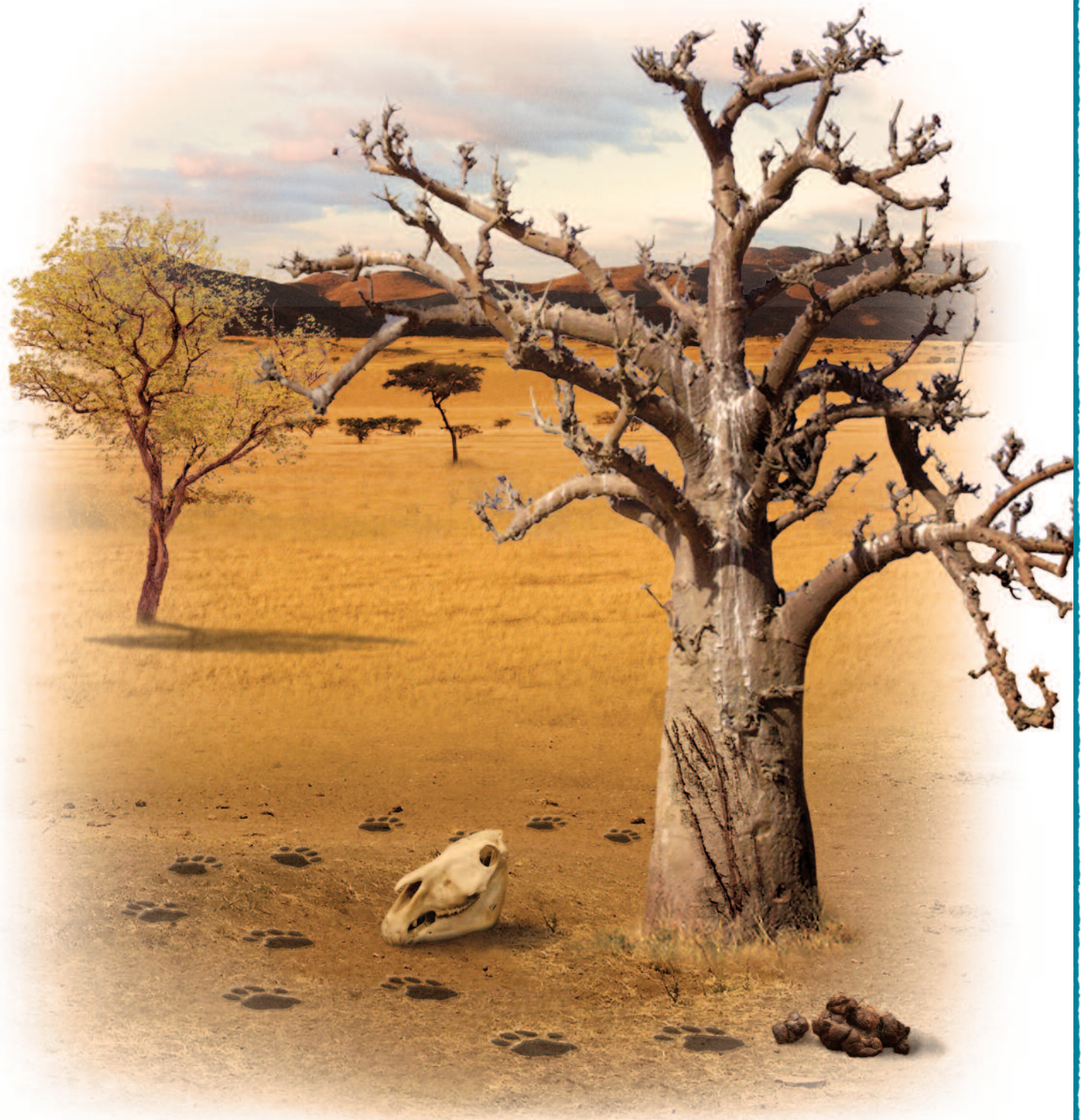
2. Compare the lion and cheetah vocalizations. How are they different?

3. Now watch the provided video clips of lions and cheetahs vocalizing. Why do you think vocalizations are important to lions and cheetahs?

4. How do researchers use vocalizations to study lions and cheetahs?

The Tools of Conservation

WHO PASSED THIS WAY?



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CATS**

The Tools of Conservation

ANIMAL TRACKING GUIDE

Use this tracking guide to help you identify the animal footprints.

AFRICAN CRESTED PORCUPINE



WATERBUCK



ZEBRA



CHEETAH



LION



AFRICAN BUFFALO



GIRAFFE



HIPPOPOTAMUS



WHITE RHINOCEROS



ELEPHANT



WHO VISITED THE WATERHOLE?



Disney
nature
**AFRICAN
CATS**

WHAT TECHNOLOGY DO RESEARCHERS USE TO STUDY AFRICAN CATS?

Setting: **Classroom** | Grade: **4–6** | Length of Activity: **1 hour** | Subjects: **Science, Math, Social Studies** | Staff: **One teacher or volunteer**

DESCRIPTION

Students will visit three activity stations to learn the various ways researchers study lions and cheetahs in the wild. After visiting these stations, students will become familiar with data and technology used to be a “Big Cat Researcher.” Research is critical in understanding lion and cheetah natural behaviors, habitat requirements, and threats to their survival.

OBJECTIVES

Through participation in this activity students will:

- Understand and apply the terms **research**, **wildlife researcher**, **natural resources**, and **conservation** to their activities.
- Utilize tools such as GPS maps, camera traps, video clips, and an ethogram to make observations about lion and cheetah behavior.

POSITIVE ACTIONS TO HELP AFRICAN CATS

You can be a Big Cat Researcher at home! Make your own ethogram and then watch a wildlife show on African cats or visit your local zoo to observe the behavior of animals such as lions and cheetahs.

MATERIALS

- Worksheet 43: *What technology do researchers use to study African cats?*
- Worksheet 44: *Who was caught on the camera trap?* – camera trap images
- Worksheet 46: *How do researchers use GPS to study cheetahs?* – illustration of cheetah movements within Makazi Game Reserve
- Worksheet 47: *What can researchers learn about cat behaviors by using an ethogram?* – ethogram

SET UP

- Make copies of worksheet 43 and distribute to each student in the class. This will be their master data sheet. Students should take this worksheet with them to each of the three research stations.
- Create three research stations in your classroom. You can duplicate more station worksheets if you’d like more stations. Stations include:
 - *Who was caught on camera trap? Camera trap images*
 - *How do researchers use GPS to study cheetahs? GPS tracking of cheetah movements*
 - *What can researchers learn about cat behaviors by using an ethogram? Ethogram to understand behavior.*

Procedures

1. Review the background information with students. Encourage class discussion through interactive questioning.
2. Students should move from station to station and analyze the data and answer the questions found on the student worksheet.
3. After completing all stations, discuss the students’ worksheet responses. Congratulate students on becoming excellent “Big Cat Researchers.” They will use their findings from this activity to help solve conservation problems in a future activity.

Wrap-up

Use the discussion points and questions below to summarize this lesson:

1. Describe how researchers use tools to study African cat behavior. *They use GPS to track movements throughout*

range, camera traps to identify specific locations where big cats are found, ethograms to understand behaviors.

2. How do you think the information about African cats would be different if tools such as GPS and camera traps did not exist? *Technology helps to record movement and patterns that would take many researchers over many years to compile so our information would be greatly reduced.*
3. How could researchers use the data that they collect about African cats to protect them in the future? *When we understand where lions and cheetahs spend their time and what behaviors they are demonstrating we can apply this data to inform/warn local people of cats near their villages and how to prevent them from coming too close.*

Research is critical in understanding lion and cheetah natural behaviors, habitat requirements, and threats to their survival. This data can inform and warn local people of lion and cheetah movements near their villages.

WHAT TECHNOLOGY DO RESEARCHERS USE TO STUDY AFRICAN CATS? (2 of 2)

Evaluation

To evaluate student comprehension, have students correctly answer the corresponding lesson questions on the *Big Ideas for Big Cats* cards.

Worksheet 43 answer key:**WHAT TECHNOLOGY DO RESEARCHERS
USE TO STUDY AFRICAN CATS?****Station 1: Who was caught on camera?**

- 1. Why did the researchers set up a camera trap?** Researchers wanted to know what types of animals were using the savanna habitat. Setting up the camera trap lets them take pictures of the savanna to collect data on the animals found there.
- 2. Compare the lion and cheetah photos. Based on what you know about lion and cheetah behaviors, explain the difference.** These photos show different activity levels at different times of day. The lion photo is taken at night, and shows the lion hunting and eating. The cheetah photo is taken during the day, and shows the cheetah walking with her cubs. This makes sense because lions are very active at night and cheetahs are more active during the day.
- 3. Explain in your own words why a camera trap is an important tool for studying animals in the wild?**
A camera trap is important because it helps researchers collect images from an area without being present. This gives them a better understanding of how animals use the area, what times they are present, what they are doing, and how many animals are there. Researchers can also use camera traps to take pictures both day and night, and at different levels, so it gives them a complete look at one habitat.

Station 2: How do researchers use GPS to study cheetahs?

- 1. How was this GPS data collected?** This GPS data was collected using a GPS tracking collar placed on a cheetah. The collar does not hurt the cheetah, but it does record data on where the cheetah is spending its time and how it is moving throughout its habitat.
- 2. When was this GPS data collected?** The month of December
- 3. Where is the cheetah spending its time?** The cheetah is spending its time within the Game Reserve
- 4. Using the distance traveled per day, calculate the average distance the cheetah traveled this month?**
 $2.25 \text{ km traveled per day} \times 31 \text{ days in December} = 69.75 \text{ km traveled during the month of December}$
- 5. What can GPS data tell researchers about an animal?** GPS data can tell researchers a lot about an animal. It can tell them where an animal is spending its time, the location of an animal at a certain time, how the animal is using its habitat, and how far it has traveled. From this information, researchers can identify an animal's home range or territory.

**Station 3: What can researchers learn about cat behavior
by using an ethogram?**

- 1. Why is it important to study behavior?** Studying behavior helps researchers better understand the daily lives of animals like lions and cheetahs. This increases our knowledge about the survival needs of these animals.
- 2. What was the cheetah doing when the observation started?** Resting **When it ended?** Eating
- 3. How many times did the cheetah stalk before catching prey?** 3 times
- 4. During the observation, did the cheetah do anything to identify its territory? If so, what?**
Yes, the cheetah did scent marking at 10:42 am.
- 5. Based on the ethogram data, on what behavior did the cheetah spend the most time? How much time in total did it spend on this behavior?** Students may be tempted to just count the number of data points and choose the category with the most data points. However, math is required for this answer:

Observation Began
 From 7:32 – 8:04 = Resting for 32 minutes
 From 8:49 – 9:24 = Resting for 35 minutes
 From 10:44 – 5:00 = Resting for 6 hours 16 minutes

Based on these calculations, the correct answer is that the cheetah spent the most time resting during the day. In total, the cheetah spent 7 hours and 23 minutes resting.

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WHAT TECHNOLOGY DO RESEARCHERS USE TO STUDY AFRICAN CATS?

Station 1: Who was caught on camera?

1. Why did the researchers set up a camera trap? _____

2 Compare the lion and cheetah photos. Based on what you know about lion and cheetah behaviors, explain the difference.

3. Explain in your own words why a camera trap is an important tool for studying animals in the wild.

Station 2: How do researchers use GPS to study cheetahs?

1. How was this GPS data collected? _____

2. When was this GPS data collected? _____

3. Where is the cheetah spending its time? _____

4. Using the distance traveled per day, calculate the average distance the cheetah traveled this month?

5. What can GPS data tell researchers about an animal? _____

Station 3: What can researchers learn about cat behavior by using an ethogram?

1. Why is it important to study behavior? _____

2. What was the cheetah doing when the observation started? _____

When it ended? _____

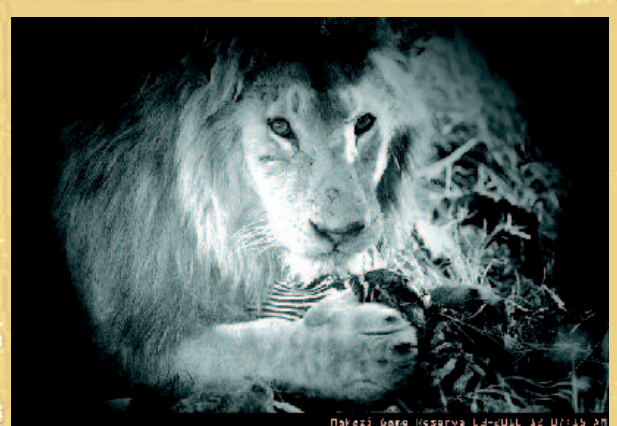
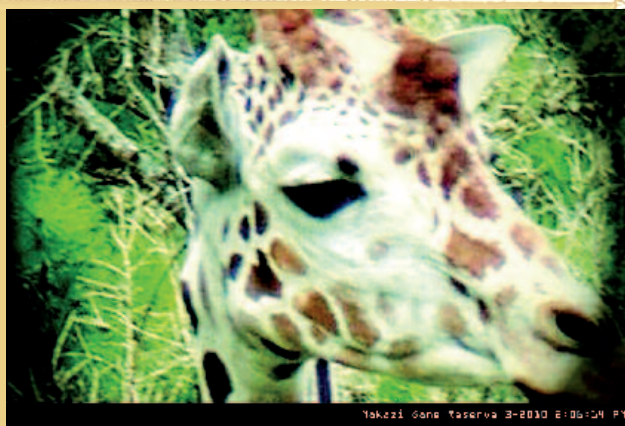
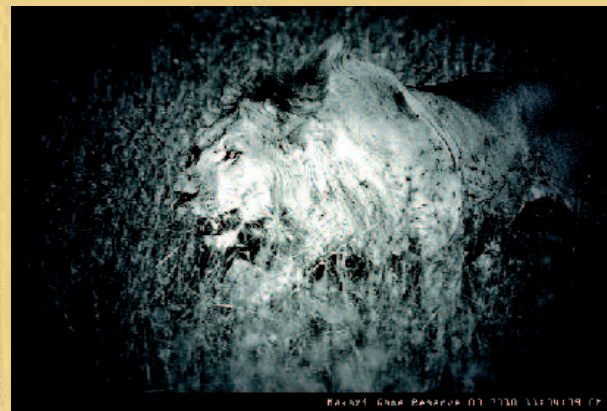
3. How many times did the cheetah stalk before catching prey? _____

4. During the observation, did the cheetah do anything to identify its territory? If so, what? _____

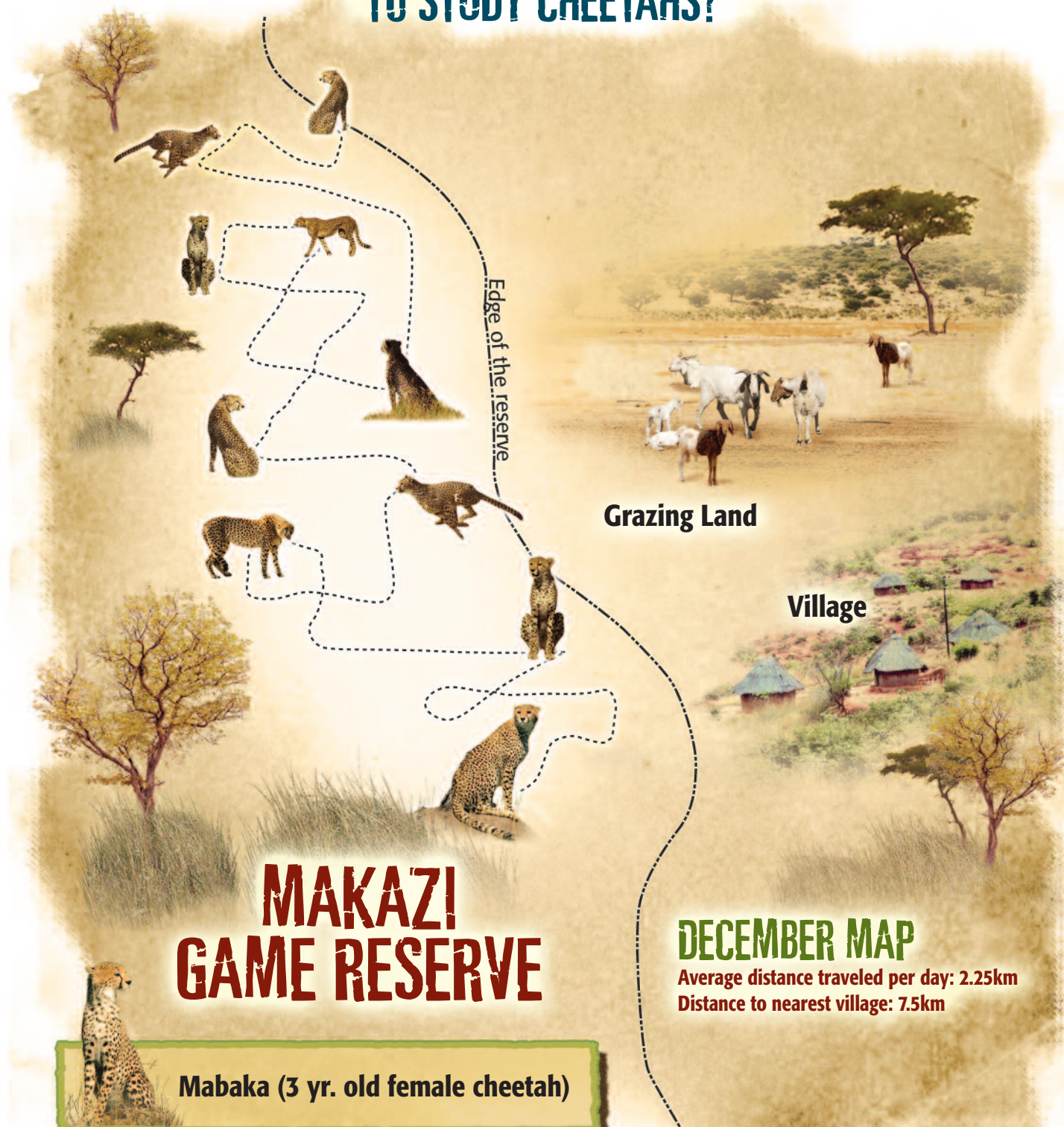
5. Based on the ethogram data, on what behavior did the cheetah spend the most time? How much time in total did it spend on this behavior? _____

The Tools of Conservation

WHO WAS CAUGHT ON CAMERA TRAP?



The Tools of Conservation

HOW DO RESEARCHERS USE GPS
TO STUDY CHEETAHS?

The Tools of Conservation

WHAT CAN RESEARCHERS LEARN ABOUT
CAT BEHAVIORS BY USING AN ETHOGRAM?

Cheetah Observations in Makazi Game Reserve

Researcher's Name: R. HowleyDate of Observation: January 15, 2010

Time that behavior was observed:

RESTING	<input checked="" type="checkbox"/> 7:32 am <input checked="" type="checkbox"/> 10:43 am <input checked="" type="checkbox"/> 8:49 am
WALKING	<input checked="" type="checkbox"/> 8:05 am <input checked="" type="checkbox"/> 9:37 am <input checked="" type="checkbox"/> 9:25 am <input checked="" type="checkbox"/> 5:01 pm
STALKING	<input checked="" type="checkbox"/> 8:47 am <input checked="" type="checkbox"/> 5:53 pm <input checked="" type="checkbox"/> 9:36 am
CAPTURING PREY	<input checked="" type="checkbox"/> 6:06 pm
EATING	<input checked="" type="checkbox"/> 6:07 pm
CARING FOR YOUNG	
PLAYING	
SCENT MARKING	<input checked="" type="checkbox"/> 10:42 am

CREATING A POSITIVE HOT TOPIC FUTURE FOR AFRICAN CATS

Educator's Background Information

African Cats Need Our Help

In Africa, shrinking habitat and growing populations force lions, cheetahs, and humans to live closer than ever before and compete for space, food, and water. The result? In the last 100 years, the world's population of cheetahs has dropped from as many as 100,000 to around 12,000 today. Cheetahs are listed as an endangered species. Until recently, scientists believed there were 100,000–200,000 lions living in Africa. However, recent studies show that their numbers have dropped dramatically to around 23,000 – with most of them living in protected national parks.

Fortunately, people around the world are working with local communities to save Africa's remaining lions and cheetahs. You can help too! But before learning about these creative solutions it is important to understand the threats currently facing these African cats:

Current Threats

Loss of habitat and prey to farming, game ranches, and development

Both lions and cheetahs need large expanses of land to survive. When people use this land for farms or livestock, the amount of land for African cats and their prey is reduced. Without enough natural prey, these cats may turn to taking domestic livestock like cattle and goats. To prevent this, farmers in some areas eliminate cheetahs and lions found on their land.

Competition with farmers and ranchers

To survive, lions and cheetahs must be able to find enough space, cover, water, and prey to thrive and raise their young. While protected parks and reserves provide some security, they are often too small to provide all that lions and cheetahs need. Reduced habitat and prey and increased competition within the parks can force lions and cheetahs to move between these protected areas and farmlands. For farmers, domestic livestock is their livelihood – their source of food and money – and losing even one goat or cow can be devastating. As a result, many farmers kill lions and cheetahs out of fear that they will take their livestock or in retaliation for livestock losses.

Poaching

Poaching is the illegal hunting, capture, or collection of wildlife. Cheetahs are poached for their beautiful spotted skins and as trophies. Limited international trade in live cheetahs and their skins is still permitted in Namibia, Zimbabwe, and Botswana. This, along with illegal trade in other parts of Africa, continues to be a threat. As mentioned before, cheetahs are also often illegally hunted because farmers fear the cheetahs will take their livestock.

Although illegal in many areas, lions are still hunted for trophies in some parts of Africa. Trophy hunting not only reduces the population but dramatically disrupts the lions' social structure. Eliminating the dominant male of a pride (normally the target of a trophy hunt) usually causes a new pride leader to kill the young of the previous male. The result is that many cubs are lost due to a single successful trophy hunt.

Competition with other predators

Cheetahs are the least aggressive of the African cats and would rather flee than fight. This makes it very hard for them to protect themselves from other predators. Lions and hyenas often steal their food and attack the cubs and adults. In some protected areas where predator populations are high, as many as 90% of cubs die before reaching adulthood. To escape this pressure, cheetahs sometimes venture away from protected areas and can come into conflict with farmers.

Creative Solutions: Creating a Positive Future for Lions and Cheetahs

Though these threats may seem daunting, it has not stopped people from working together to save these African cats. Solving conservation issues is complex. It requires creative problem solving, education, scientific study, and local community involvement. Here are a few of the creative solutions being used to save these magnificent cats:

Community Education:

Promoting a positive attitude toward lions, cheetahs, and other predators among farmers and local residents is an important component of many predator conservation programs. Having always seen predators as a threat, local

Creating a Positive Future for African Cats

residents are often unaware of the important role that they play in the environment. Community workshops, training, and support are giving farmers the skills, knowledge, and materials to protect their livestock. School education programs help students (the next generation of farmers) better understand and appreciate the lions, cheetahs, and other predators who share their lands.

Training farmers in effective livestock management - African Wildlife Foundation and Cheetah Conservation Botswana:

These and other conservation groups are helping farmers use livestock techniques that discourage lions and cheetahs from preying on livestock. Hiring trained herders to supervise grazing livestock, keeping livestock guarding animals like dogs and donkeys, and housing herds in strong, protective bomas (corrals) not only keep predators safe, but also produces healthier, more valuable herds.

Dogs Saving Cats: The Cheetah Conservation Fund's Livestock Guard Dog Program

To discourage cheetahs from killing livestock, The Cheetah Conservation Fund gives Anatolian Shepherd puppies to farmers to guard their herds. Originally from Turkey, where the dogs are used to protect livestock against wolves and bears, the puppies grow up with farmer's livestock herds and quickly learn to protect them. The breed's natural guarding instincts paired with the cheetah's natural flight vs. fight instinct have made this project a great success. Farmers who use livestock guarding dogs see up to an 80% decrease in livestock losses. Farmers are more willing to let cheetahs live on their land when they no longer see them as a threat to their livelihood.

Predator Compensation Program – Maasailand Preservation Trust:

The goal of this program is to prevent or greatly decrease the killing of lions and eliminate the use of poisons by reimbursing local farmers for livestock killed by lions and other predators. Thanks to this program, which includes training farmers in predator-friendly livestock methods, lion killing has virtually stopped in the surrounding community. Other predators like hyenas, cheetahs, leopards, wild dogs, and jackals have been protected as well.

The Disney Worldwide Conservation Fund: Helping to Save African Cats

The Disney Worldwide Conservation Fund (DWCF) is an annual awards program focused on the study and protection of the world's wildlife and ecosystems. Since 1996, The Disney Worldwide Conservation Fund has supported a variety of conservation programs focused on saving lions and cheetahs, while helping local communities. Here are two sponsored projects:

- ***People and Predators: Maasailand Lion Conservation Program***

Members of this organization train villagers (members of the Maasai tribe who have traditionally speared lions for ceremonial purposes and in retaliation for livestock attacks) to monitor lion populations, build lion-proof livestock corrals, patrol and protect lion habitat, and present lion education programs in local schools.

- ***Cheetah Conservation Botswana's Theatre Outreach***

This project focuses on monitoring Botswana's cheetahs to reduce livestock/predator conflicts, training local farmers in cheetah-friendly livestock methods, and transforming a film produced in 2007, "Spirit of the Kalahari," into a traveling theatrical show.



Creating a Positive Future for African Cats

You Can Help!

Although you may live thousands of miles from Africa, you can help protect lions and cheetahs and even the wildlife in your own backyard. Here are some ways you can make a difference for African cats and local wildlife:

- See DisneyNature's **AFRICAN CATS**: Follow the journey of two of Africa's most incredible cats – a lioness and a cheetah – as they raise their cubs, face challenges, and explore their world on the great plains of Kenya's Masai Mara.
- Learn more about African cats: Read books and check out the websites listed in this Guide. Subscribe to wildlife conservation magazines and watch nature shows on television. Contact local chapters of conservation groups to find out what is being done to help wildlife in your area and learn how you can help.
- Be an African cat ambassador: Speak up for African cats. Let

your friends and family know how much you care. Tell your family and friends about the threats facing cheetahs and lions, the important role they play in the environment, and what others can do to help them.

- Create habitats for wildlife in your backyard or schoolyard: Like the cheetahs and lions of Africa, your local wildlife needs habitat too! You can help by providing habitat in your backyard or schoolyard. So hang a bird house, plant a native tree, grow a butterfly garden, build a log pile, construct a pond, or add a bird bath and make a difference for wildlife!

Visit <http://www.nwf.org/Get-Outside/Outdoor-Activities/Garden-for-Wildlife/Schoolyard-Habitats.aspx> to learn more.

- Keep habitats clean: Pick up litter and clean up after your pets so their waste does not wash into rivers and streams. Join a beach or river clean-up.



DisneyNature
**AFRICAN
CATS**

Creating a Positive Future for African Cats

WHAT ARE THE THREATS TO CHEETAHS
AND LIONS IN THE WILD?

Grade: 4–6 | Length of Activity: 30 minutes | Subjects: Science, Conservation, Social Studies | Staff: One teacher or volunteer

DESCRIPTION

Students will discuss the challenges that pose threats to cheetahs, lions, and their habitat. They will discover that through positive actions people have the ability to protect cheetah and lion habitats for future generations.

OBJECTIVES

After participating in this activity students will be able to:

- Identify two threats to cheetahs and lions in the wild.
- Analyze positive solutions that will help protect cheetah and lion populations.

POSITIVE ACTIONS TO HELP AFRICAN CATS

Spend time in your backyard, schoolyard, or neighborhood park and think about the threats to wildlife that live there. Learn more about actions you can do to help wildlife in your backyard.

MATERIALS

- 12 circles of string or use hula hoops
- List of scenarios
- Worksheet 48: *What are the biggest threats to cheetahs and lions in the wild?* – photographs

SET UP

- Cut 12 pieces of string 5–6 feet long to form hoops
- Print out the list of game scenarios
- Copy and cut out images from worksheet 48: *What are the biggest threats to cheetahs and lions in the wild?*

Background Information

Cheetahs and lions face many challenges on the savanna, some of which are caused by people. This lesson identifies those challenges and suggests ways that people can help protect African cats for the future. The threats are listed below:

**Illegal Hunting (Poaching)**

Cheetahs are an endangered species and hunting of them is illegal in protected areas and national parks. However, illegal hunting of cheetahs for their beautiful spotted coats still

occurs. Many of these coats are bought by people from other countries, including the United States. Lions are often hunted as trophies, not only by local people but by an increasing number of international tourists (especially from the United States and Europe).

Living Too Close to the Savanna Habitat

Just like people in the United States often live close to forests, grasslands, or wetlands, people have built villages close to the wild habitats of African cats. In the United States, this can cause conflicts between people and animals such as wolves, bears, and alligators. For people in Africa, conflict can occur between lions, cheetahs, and other large predators. Because lions can be a threat to people in villages, they are sometimes

hunted when the lions come too close to the villager's homes.

People also raise their farm animals near the savanna, and when they leave their livestock unprotected, it encourages lions and cheetahs to capture these livestock animals instead of their usual wild animal prey (the same situation occurs when coyotes or wolves take livestock from farmers in the United States). Because livestock is a source of both food and money for farmers, losing even one goat or cow can be devastating. As a result, when farmers lose their livestock to African cats, they often hunt the lions and cheetahs as retaliation.

**Overhunting of Prey Animals**

Some of the food that people eat, such as gazelle, is also food for animals like lions and cheetahs. Traditionally, this has not been a problem for wildlife populations on the African savanna. However, in any ecosystem, if demand starts to outgrow the supply this can put pressure on all of the wildlife involved. In countries all over the world, people are expanding into rural areas and finding new places to live. This is true on the African



Creating a Positive Future for African Cats

WHAT ARE THE THREATS TO LIONS AND CHEETAHS IN THE WILD? (2 of 4)

savanna, where more people are living on the savanna and hunting animals for food. Although people can hunt grazing animals at a sustainable rate, over-hunting these animals can cause a decrease in food supply for lions and cheetahs.



Land Use for Human Development

As the human population increases, more and more land is developed for human use and wildlife habitats are shrinking. Habitat loss is the major reason for the decline of wildlife populations worldwide.

Procedures

1. Begin by showing the participants the photos of the different threats.
2. Ask participants to identify the threats shown in the photos. Ask them what they know about these threats.
3. Discuss each threat using the corresponding prop or image.
 - Illegal Hunting – *“Do you know some reasons why lions and cheetahs are hunted? Why is it important not to hunt in protected areas for lions and cheetahs?”*
 - Living too close to the savanna – *“What problems might be caused by humans living too close to the savanna? What conflicts might come up between humans and African cats?”*
 - Over-hunting of grazing animals – *“Why are grazing animals important on the savanna? What problems might be caused from over-hunting of these animals?”*
 - Land Use for Human Development – *“As more and more land is developed for people, what happens to the habitats for animals?”*
4. Now play the **Wildlife Threats Game** – Have the participants pick an animal that they would like to be; possibly one of the animals used in the previous activities (more than one of a species is fine).
5. Participants start the game by standing inside their own string hoop; the hoops represent an animals’ habitat.
6. **Rules:** Participants must have at least one foot fully in a hoop to be safe, however, if only one foot is inside the

hoop then that animal is considered endangered. Sharing of habitat is allowed and encouraged, but no more than 2½ people per hoop. Others are eliminated from the game.

7. Read the scenarios below as participants walk around the circle of hoops, passing through each hoop as they go along.
8. When the leader says **“stop”** participants should jump into the nearest habitat/hoop. After the scenario has been read, the leader will either remove or add a hoop to the circle. If there are no hoops available for the participants to put at least one foot into, they have lost their home and are out of the game for now.
9. Follow the instructions on the scenario sheet and adjust the hoops accordingly. Note, at the beginning of the game you will be removing hoops. However, half way through the game, you will be adding hoops back into the circle. So participants that may have lost their habitat will be able to rejoin the game.

Threats to Wildlife Game Scenarios

Read these scenarios out loud to the participants as they walk among the hoops. To see how the habitat changes, review the diagrams on the following page.

Start everyone walking. Read Scenario #1.

1. As more people move into the community, gazelles are over-hunted which means less food for cheetahs. Cheetahs begin to disappear.
 - Remove 2 circles, ask participants to stop walking and jump into the nearest hoop. Two participants will have to share a habitat with others.

Start everyone walking. Read Scenario #2.

2. People dump their garbage into the local water sources, contaminating the watering holes used by lions and cheetahs.
 - Remove 2 circles, ask participants to stop walking and to jump into the nearest hoop. Two more participants will have to share a habitat with others.

Start everyone walking. Read Scenario #3.

3. People begin hunting cheetahs because they are eating their goats.
 - Remove 2 circles, ask participants to stop walking and jump into the nearest hoop.

Creating a Positive Future for African Cats

WHAT ARE THE THREATS TO LIONS AND CHEETAHS IN THE WILD? (3 of 4)

Have everyone stop for a moment and look around. Ask the participants:

"What has happened to your habitat?"

Response: It has gotten smaller. All habitats have more animals depending on the same food, water, and shelter.

Start everyone walking. Read Scenario #4.

4. People build a new village in a nearby savanna which means fewer habitats for lions to hunt.
 - *Remove 2 circles from the center. Ask participants to stop walking and jump into nearest hoop.*

Start everyone walking. Read Scenario #5.

5. Ranchers begin hunting lions because they are eating their cattle.
 - *Remove 2 circles from the center. Ask participants to stop walking and jump into nearest hoop.*

Have everyone stop for a moment and look around. Ask the participants:

"How many animals are endangered? How many have been removed from the game? Why?"

Response: (The number depends on how many start the game.) As negative actions occur on the savanna and to wildlife, the amount of habitat is reduced and animals may become extinct or be forced to move to other savannas.

Start everyone walking. Read Scenario #6.

6. People in a local community teach others about the importance of prey animals to cheetahs and lions.
 - *Give back 1 circle. Ask participants to stop walking and jump into nearest hoop.*

Start everyone walking. Read Scenario #7.

7. A group of children join a wildlife club that picks up trash near water sources and shares with their families how to properly dispose of their trash.
 - *Give back 1 circle. Ask participants to stop walking and jump into the nearest hoop.*

Start everyone walking. Read Scenario #8.

8. A community group helps herdsmen build shelters to protect their cattle from lions at night.

- *Give back 1 circle. Ask participants to stop walking and jump into the nearest hoop.*

Start everyone walking. Read Scenario #9.

9. A local conservation group gives herdsmen guard dogs to protect their goats from hunting cheetahs.
 - *Give 2 circles back. Ask participants to stop walking and jump into nearest hoop. Ask all participants to rejoin the game and find a habitat to share.*

Start everyone walking. Read Scenario #10.

10. Parents teach their children to respect all living things, even the predators.
 - *Give 2 circles back. Ask participants to stop walking and jump into nearest hoop. Ask all participants to rejoin the game and find a habitat to share.*

Have everyone stop and look around. Ask the participants:

"How did the positive actions of the community help wildlife?"

Response: Wildlife was protected by using guard dogs and building shelters to protect livestock in order to reduce the number of lions and cheetahs that are hunted for preying on livestock. Picking up trash protects water sources, people, and wildlife, and teaching others helps protect animals and savanna habitats for future generations.

CONGRATULATIONS . . . THESE ACTIONS HELPED PROTECT WILDLIFE!!!!

Wrap-up

When the activity is finished, ask participants what they learned and how they felt. Many animals will have lost their original habitat/hoop, and others will be very crowded in the remaining habitat, while others were eliminated. Who was the cause of the threats to lions and cheetahs? *People* What positive actions were taken to benefit wildlife and the people who share these same resources? *Education, livestock management, habitat clean-up.* Based on the threats described in the activity, how can people balance their needs and the needs of wildlife? *Save space for people and wildlife, learn more about wildlife to better understand how to meet their needs, better protect their livestock from predators so they don't get taken.*

Creating a Positive Future for African Cats

WHAT ARE THE THREATS TO LIONS AND CHEETAHS IN THE WILD? (4 of 4)

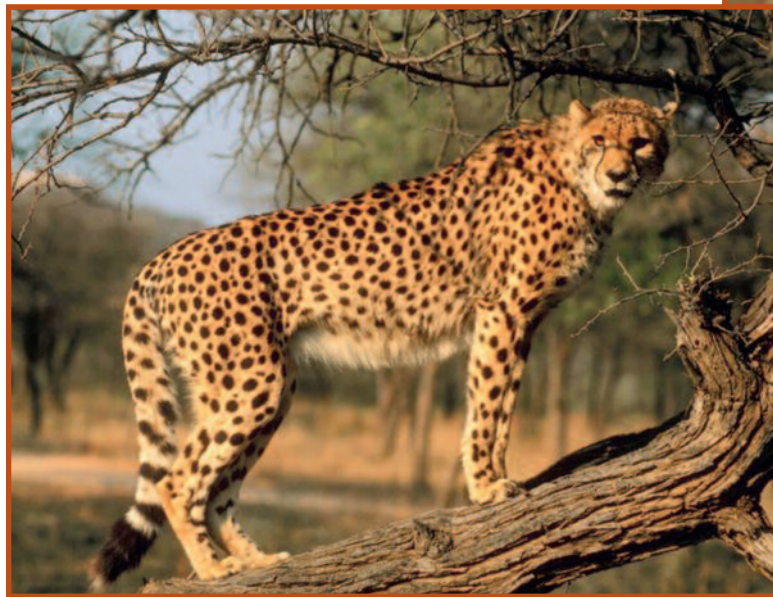
Extension

Conflicts between large predators and people occur all over the world, not just in Africa. In Asia, people and tigers compete for space and resources. In many parts of North America, predators such as coyotes, wolves, mountain lions (also known as cougars and panthers), bobcats, bears, alligators, and crocodiles find themselves in conflict with people. As an extension to this activity, encourage students to conduct their own research about threats facing a top predator in their area. Students should compile these threats into a report or presentation for the class. Some helpful websites include:

- Defenders of Wildlife: <http://www.defenders.org/>
- National Wildlife Federation: <http://www.nwf.org/>
- US Fish and Wildlife Service: <http://www.fws.gov/>
- Your state's Department of Natural Resources Website

Evaluation

To evaluate student comprehension, have students correctly answer the corresponding lesson questions on the *Big Ideas for Big Cats* cards.



Creating a Positive Future for African Cats

WHAT ARE THE BIGGEST THREATS TO CHEETAHS AND LIONS IN THE WILD?



ILLEGAL HUNTING



LIVING TOO CLOSE TO SAVANNA



OVERHUNTING OF PREY



LAND USED FOR HUMAN DEVELOPMENT

Creating a Positive Future for African Cats

HOW CAN I HELP WILDLIFE?

Setting: **Classroom** | Grade: **2–3** | Length of Activity: **30 minutes** | Subjects: **Science, Conservation** | Staff: **One teacher or volunteer**

DESCRIPTION

Students will use photographs to discuss a variety of ways they can help animals and their habitats. This activity should leave students feeling that everyone can help animals and their habitats by taking simple action steps. Little changes, like learning more about animals, creating a backyard habitat, or picking up litter, can make a world of difference for wildlife and wild places!

OBJECTIVES

Through participation in this activity students will:

- Discuss eight simple ways they can make a difference for wildlife.
- Commit to complete at least one of these actions to help animals and their habitats.

POSITIVE ACTIONS TO HELP AFRICAN CATS

See Disneynature's new film **AFRICAN CATS** to make a difference for lions and cheetahs.

MATERIALS

- Worksheet 49: *How can I help wildlife?*
 - photograph cards of simple actions

SET UP

- Print worksheet 49 and cut out each image.
- Post each image at the front of the classroom.

Procedures

1. Discuss with students the importance of helping animals and their habitats. Ask the students to share something that they think that they can do to help animals near their home
2. Review the individual pictures with the students. Discuss what each photograph is depicting and how that action might help.
3. Encourage students to take action to protect wildlife by creating pledge cards. Each student will draw a picture and write their action step on a piece of paper. They should choose one of the eight actions discussed in class. Students should sign (or write their name) on their pledge card as a promise to help wildlife.
4. Hang the students' pledges on a wall or bulletin board in the classroom.
5. Optional: to follow-up on students' promises, they could be rewarded with some type of small prize after completing the action written on their pledge card.

Wrap-up

Summarize this activity by having students complete the following tasks.

1. In your own words, explain why it is important that each of us take action to protect animals and their habitats?
Example: people can cause problems for animals but they can also do positive actions that help them; if we care about wildlife we should act in a way that shows it.
2. Create a tagline or a slogan to encourage others to help protect animals.

Little changes, like learning more about animals, creating a backyard habitat, or picking up litter, can make a world of difference for wildlife and wild places!

Evaluation

To evaluate student comprehension, have students correctly answer the corresponding lesson questions on the *Big Ideas for Big Cats* cards and place on a bulletin board in the proper order.



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Creating a Positive Future for African Cats

WHAT CAN I DO TO HELP WILDLIFE?



LOOK FOR ANIMALS



LEARN MORE ABOUT ANIMALS



VISIT YOUR LOCAL AZA ZOO



PLANT A TREE



PICK UP LITTER



LOOK FOR ANIMAL CLUES



RECYCLE



HANG A BIRDHOUSE

HOW CAN SCIENCE-BASED CONSERVATION SOLUTIONS PROTECT AFRICAN CATS?

Setting: **Classroom** | Grade: **4–6** | Length of Activity: **30–45 mins.** | Subjects: **Science, Conservation** | Staff: **One teacher or volunteer**

DESCRIPTION

Students will be able to apply research data to real-life conservation issues. By comparing two illustrations of cheetah movement within the fictional Makazi Game Reserve, students will draw conclusions as to how movement patterns have changed. They are then presented with a real-life scenario and will use their independent research skills to propose conservation solutions. Conservation is a complex and interdisciplinary topic that involves research, education, creative thinking, and community involvement.

OBJECTIVES

Through participation in this activity students will:

- Interpret two GPS range maps depicting lion and cheetah movement.
- Conduct their own research on current conservation solutions and success stories.
- Identify at least two conservation solutions to threats facing cheetahs in the wild.

POSITIVE ACTIONS TO HELP AFRICAN CATS

Learn more about the efforts of conservation organizations, like African Wildlife Foundation, currently working to help protect lions and cheetahs in the wild.

MATERIALS

- Worksheet 46: *How do scientists use GPS to study cheetahs?* – Illustration of cheetah movements within Makazi Game Reserve from December (from *What technology do researchers use to study African cats?* Activity).
- Worksheet 51: *Conservation Solutions* – question sheet
- Worksheet 52: *How can science-based conservation solutions protect African cats?* – illustration of lion and cheetah movements within Makazi Game Reserve in March.
- Computers and websites that provide information on conservation solutions for lions and cheetahs.

SET UP

- Re-use worksheet 46 from *What technology do researchers use to study African cats?* Activity
- Print out or make copies of worksheets 51 and 52 for each student.

Procedures

1. Split the class into small groups (if this activity is immediately following the *What technology do researchers use to study African cats?* activity, you may choose to keep students at the individual “research” stations).
2. Hand out worksheet 46 once more. Remind students that this data shows the movements of a female cheetah.
3. Now distribute worksheets 51 and 52 to each small group.
4. Have the class compare the data on these two worksheets and make deductions.
6. The researchers want to propose some solutions to the villagers that will protect both their livestock and cheetahs. But, researchers are not sure what to suggest. It is the students’ turn to be conservationists! Have the class research real-life conservation solutions using the following websites:

<http://www.awf.org/content/solution/detail/3504>

http://www.afwpw.org/programs/maasailand_lion_conservation_program

<http://wildlifeconservationnetwork.org/wildlife/lion.html>

<http://wildlifeconservationnetwork.org/wildlife/cheetahbotswana2.html#solutions>

<http://wildlifeconservationnetwork.org/wildlife/cheetahnamibia.html>

7. In small groups, students should use their findings to write a proposal to the villagers of Makazi. They should include at least two solutions to the conflict between cheetahs, the village livestock, and the people and should keep the involvement of the local village in mind. Their proposals need to include solutions that the villagers can continue doing after the researchers have left the area. After writing their proposals, have students present them to the class.

Extension

Using the threats they identified in the Extension Activity for Lesson 7, Activity 1: *What are the biggest threats to cheetahs*

Creating a Positive Future for African Cats

HOW CAN SCIENCE-BASED CONSERVATION SOLUTIONS PROTECT AFRICAN CATS? (2 of 3)

and lions in the wild?, encourage students to research conservation solutions in place to address these threats. Students should evaluate the effectiveness of these conservation solutions based on how they help both animals and people. They can then propose other ideas to help reduce local predator-people conflicts.

Wrap-up

Use the discussion points and questions below to summarize this lesson.

1. Conservation is complicated. Describe some of the challenges that researchers may face when they are working on a conservation solution. *People build villages too close to predators' home range and therefore come into conflict situations, people overhunt predators and their prey and need limits on hunting, people need to save space for predators and for themselves.*

2. Explain why it is necessary to include the local people in the planning of a conservation solution. *People are a big part of the conservation equation and therefore need to be a big part of any successful solutions; most of the threats faced by big cats today are the direct result of human actions.*

Conservation is a complex and interdisciplinary topic that involves research, education, economics, influencing skills, creative thinking, and community involvement.

Evaluation

To evaluate student comprehension, have students correctly answer the corresponding lesson questions on the *Big Ideas for Big Cats* cards and place on the bulletin board in order.



Creating a Positive Future for African Cats

HOW CAN SCIENCE-BASED CONSERVATION SOLUTIONS PROTECT AFRICAN CATS? (3 of 3)

Worksheet 51 answer key: CONSERVATION SOLUTIONS

- 1. Where did the cheetah spend most of its time in March? How is this different from the December map?**
In March, the cheetah spent its time very close to the village. This is different because in December, the cheetah spent its time in the Game Reserve. It did not go near the village
- 2. What caused the change in where the cheetah spends its time?** The presence of the lion pride has pushed the cheetah out of the Reserve and closer to the village
- 3. What has changed about the cheetah since December?** The cheetah is now traveling with her cubs.
- 4. How has the average distance traveled per day changed since December?** The average distance traveled per day has gotten shorter since December. In December, the cheetah traveled an average of 2.25 km per day. Now, she is only traveling 1.75 km per day
- 5. What are some possible reasons for the change in distance traveled?** There are several reasons that distance traveled could have changed. One is that now the cheetah is traveling with cubs and cannot go as far as she was able to on her own. The other is that she is now closer to the village and has much less room to travel, making her average daily distance traveled shorter
- 6. How has the distance to the nearest village changed? Why do you think this occurred?** The distance to the nearest village has also gotten shorter. The cheetah was 7.5 km from the nearest village. She is now only 0.5 km to the nearest village. This may have occurred because the lion pride has pushed the cheetah out of the Reserve. Now that she has cubs, she also needs to find more food to feed her cubs. Since she can no longer hunt her normal prey, she may be closer to the village because there is livestock there.
- 7. What change has occurred in the village due to the presence of the cheetah?** There are fewer goats now that the cheetah is present
- 8. Help researchers and local people identify a plan to protect cheetahs and people. Use the websites below to research possible conservation solutions and explain how each plan will help to resolve the issue. Your plan should describe how you would include the villagers in the solutions.** Students may present a variety of solutions, but the four main solutions are: creating livestock bomas, using livestock guard dogs, creating a livestock compensation program, and community education. These are all described in detail in the background information and on the websites below.
 - <http://www.awf.org/content/solution/detail/3504>
 - http://www.afrpw.org/programs/maasailand_lion_conservation_program
 - <http://wildlifeconservationnetwork.org/wildlife/lion.html>
 - <http://wildlifeconservationnetwork.org/wildlife/cheetahbotswana2.html#solutions>
 - <http://wildlifeconservationnetwork.org/wildlife/cheetahnamibia.html>

Creating a Positive Future for African Cats

CONSERVATION SOLUTIONS

1. Where did the cheetah spend most of its time in March? How is this different from the December map?

2. What caused the change in where the cheetah spends its time?

3. What has changed about the cheetah since December?

4. How has the average distance traveled per day changed since December?

5. What are some possible reasons for the change in distance traveled?

6. How has the distance to the nearest village changed? Why do you think this occurred?

7. What change has occurred in the village due to the presence of the cheetah?

8. Help researchers and local people identify a plan to protect cheetahs and people. Use the websites below to research possible conservation solutions and explain how each plan will help to resolve the issue. Your plan should describe how you would include the villagers in the solutions.

- <http://www.awf.org/content/solution/detail/3504>
- http://www.afrpw.org/programs/maasailand_lion_conservation_program
- <http://wildlifeconservationnetwork.org/wildlife/lion.html>
- <http://wildlifeconservationnetwork.org/wildlife/cheetahbotswana2.html#solutions>
- <http://wildlifeconservationnetwork.org/wildlife/cheetahnamibia.html>

Creating a Positive Future for African Cats

HOW CAN SCIENCE-BASED CONSERVATION
SOLUTIONS PROTECT AFRICAN CATS?

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GLOSSARY

Adaptation *a trait that helps an animal survive in its environment*

Behavioral adaptation *a natural habit or action that makes an animal well suited for its environment*

Biodiversity *variety of living forms; three major types of biodiversity are species, genetic, and ecosystem diversity*

Camera trap *a special camera equipped with a motion-detecting beam that is used to take pictures of objects in the absence of people*

Carnivore *an animal that eats mostly meat*

Carriion *a dead and decaying animal*

Coalition *a small group of animals; in African cats, this typically refers to a group of male cheetahs or lions*

Conservation *the careful use, preservation, and protection of natural resources*

Consumer *an organism that does not make its own food; there are different types of consumers: primary consumers eat producers, secondary consumers eat primary consumers, and tertiary consumers eat secondary consumers*

Continent *one of seven great landmasses on earth*

Country *a geographical region with a government and political borders*

Crèche *a nursery group of animals; female lions raise their young in nursery groups called crèches*

Decomposer *a living organism at the base of the food web that breaks down dead animals and plants*

Ecosystem *all the living and nonliving components found within a given area that function together as a unit*

Enrichment *items and activities that encourage natural behaviors*

Energy *ability to do work; energy can take many forms including heat and light*

Ethogram *a catalog of behaviors*

Food chain *the way energy is transferred from producers to consumers*

Food pyramid *a diagram of energy transfer from producers to consumers in an ecosystem*

Food web *an interconnected network of feeding relationships*

Fungus *a multi-cellular organism that is neither a plant nor an animal and gets its energy from breaking down other organisms; a mushroom is an example of a fungus*

GPS *a technology that uses the Global Positioning System (GPS), a system of navigational satellites that can provide accurate data on an object's location for land, air, or sea*

Grassland *semi-arid areas dominated by grasses and little to no trees. Tropical grasslands are characterized by warm temperatures year round and heavy seasonal rainfall. Temperate grasslands experience hot summers and cold winters. Savannas, pampas, plains, steppes, prairies and veldts are all types of grasslands.*

Habitat *a place where plants and animals find everything they need to survive*

Herbivore *an animal that eats only plants*

Natural resource *something that comes from nature (animals, plants, fungus, air, water, minerals, and soil are all examples of natural resources)*

Nocturnal *active at night*

Omnivore *an animal that eats plants and animals*

Physical adaptation *a physical trait that makes an animal well suited for its environment*

Predator *organisms that kill and eat other organisms*

Prey *any creature that is hunted and caught to be eaten for food*

Pride *a family group of lions consisting of 2–30 individuals*

Producer *an organism that is able to make its own food (i.e., plants, algae)*

Range *the area where an organism naturally lives*

Retractable claws *claws that can be pulled all the way into the foot pad*

Research *the use of the scientific method to ask questions and collect data about a subject*

Savanna *a rolling grassland scattered with shrubs and isolated trees, found between tropical rainforests and desert biomes along the equator. Savannas are characterized by warm temperatures year round with very long dry seasons and a wet season.*

Scavenger *an animal that feeds off of food killed or acquired by another animal*

Scent marking *marking an area with body odor, scent from a gland, urine, or scat to communicate with others of the same species*

Social grooming *an activity in which individuals in a group clean or maintain each other's body or appearance*

Semi-retractable claws *claws that can only be pulled part of the way into the footpad*

Synchronized birthing *the process of giving birth at or around the same time; in lions, several lionesses will experience synchronized birthing and raise their litters together*

Tracking collar *a special collar equipped with a Global Positioning System device to record an animal's movement throughout its habitat*

Training *the process of teaching an animal to perform a requested behavior on cue*

Territory *the space an animal defends from other animals (usually of the same species) for mating or feeding*

Thicket *a dense group of tall grasses, bushes, or trees*

Vocalization *a sound produced by an animal through its nose, throat, or lungs and used to communicate with members of its own species*

Wildlife researcher *a person who studies living organisms such as algae, fungus, plants, or animals*

RESOURCE GUIDE

African Cat Adaptations, Behavior, Research and Conservation

Cheetahs

- Cheetah Conservation Botswana: <http://www.cheetahbotswana.com/>
- Cheetah Conservation Fund: <http://www.cheetah.org/>

Lions

- A Library of the World's Animals Lion distribution map:
<http://www.learnanimals.com/lion/lion-distribution.php>
- National Geographic:
<http://animals.nationalgeographic.com/animals/mammals/african-lion/>
- University of Minnesota- Lion Research Center:
<http://www.cbs.umn.edu/eeb/lionresearch/about/>

Books

- John Seidensticker, Susan Lumpkin, and Frank Knight. 1991. *Great Cats (Majestic Creatures of the Wild)*. Rodale Press
- Gus Mills and Martin Harvey. 2001. *African Predators*. Smithsonian Institution Press.

Research and Conservation

- African Wildlife Foundation: <http://www.awf.org/>
- Association of Zoos and Aquariums: www.aza.org
- Cheetah Conservation Fund Livestock Guarding Dog Program:
http://www.cheetah.org/?nd=guarding_dog_program
- Disney Worldwide Conservation Fund: www.disney.com/conservation
- Lion camera trap images:
<http://lionguardians.wildlifedirect.org/tag/camera-trap/>
- Lion Guardians Program: <http://www.lionconservation.org/lion-guardians.html>
- Living with Lions: <http://www.lionconservation.org/>
- National Geographic – Big Cats Initiative:
<http://animals.nationalgeographic.com/animals/big-cats/>
- Wildlife Conservation Network:
<http://wildlifeconservationnetwork.org/wildlife/lion.html>
<http://wildlifeconservationnetwork.org/wildlife/cheetahbotswana2.html#solutions>
<http://wildlifeconservationnetwork.org/wildlife/cheetahnamibia.html>
- Wildlife Conservation Society: www.wcs.org

African Culture

- Maasai People and Culture:
<http://www.maasai-association.org/maasai.html>
- Serengeti National Park: <http://www.serengeti.org/>

Natural Ecosystems

- Biomes of North America: <http://waynesword.palomar.edu/biomes.htm>
- Blue Planet Biomes:
http://www.blueplanetbiomes.org/world_biomes.htm
- Geography 4kids:
http://www.geography4kids.com/files/land_ecosystem.html
- Missouri Botanical Gardens: <http://www.mbgnet.net/>
- neoK12: <http://www.neok12.com/Ecosystems.htm>
- Vanderbilt's North American EcoRegions:
<http://www.cas.vanderbilt.edu/bioimages/ecoregions/nam-ecoregions-list.htm>

Related Curriculum for Educators:

- Cincinnati Zoo's A Voice for the Cheetah Guide:
http://www.cincinnati.zoo.org/discovery/schools/documents/CheetahGuide_K-6.pdf
- The Cheetah Conservation Fund – Educator's Guide:
<http://www.cheetah.org/?nd=edaides>
- Cheetah Conservation Fund Botswana – Cheetah: A Predator Resource for the Students of Botswana:
http://www.cheetahbotswana.com/downloads/Cheetah_Student_Book.pdf
- Middle School Portal-Discover Resources – Populations and Ecosystems: <http://msteacher.org/epubs/science/science17/science.aspx>
- Project Wild: <http://www.projectwild.org/>
- Snow Leopard Trust – Engaging students in Conservation: Protecting the Endangered Snow Leopard:
<http://www.snowleopard.org/catfactsclassroom/classroom>

Taking Action

- Conservation International: www.conservation.org
- International Fund for Animal Welfare: www.ifaw.org
- National Wildlife Federation – Create a Certified Wildlife Habitat:
<http://www.nwf.org/Get-Outside/Outdoor-Activities/Garden-for-Wildlife/Create-a-Habitat.aspx>
- The Nature Conservancy: www.nature.org
- US Fish and Wildlife Service: <http://www.fws.gov/>

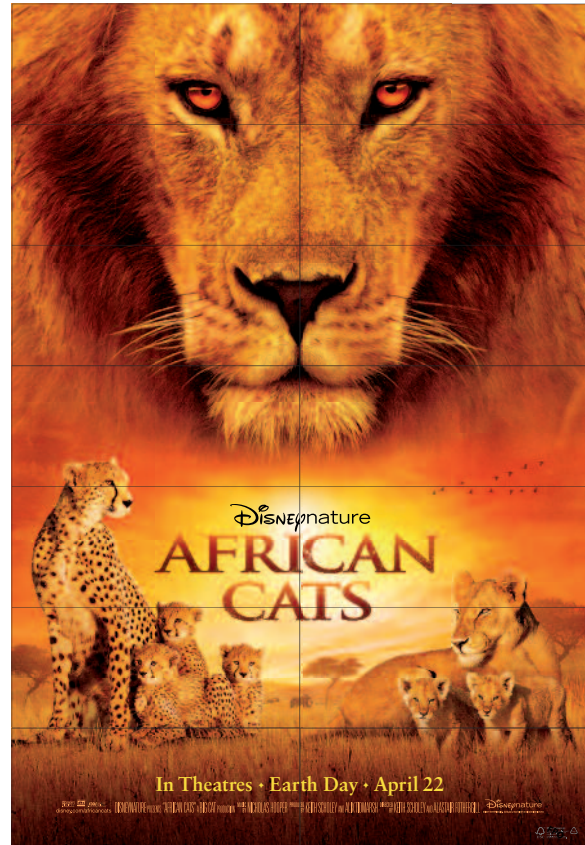


BIG IDEAS FOR BIG CATS

Grades 2-3

Copy pages 100–109. Cut along the outer edge of each card set and glue each front set to it's corresponding back set. Then, cut the cards apart. There are 14 cards in all. Each card will have a question on the front and a piece of an image on the back. Be sure the correct fronts match to the correct backs. As your class answers each question successfully, create the movie poster below by taping the cards together.

<p>WHERE DO LIONS AND CHEETAHS LIVE?</p> <p>List two countries where lions live.</p> <p><small>Disney</small> AFRICAN CATS</p>	<p>WHERE DO LIONS AND CHEETAHS LIVE?</p> <p>List two countries where cheetahs live.</p> <p><small>Disney</small> AFRICAN CATS</p>
<p>CAN YOU BECOME AN AFRICAN CAT OLYMPIAN?</p> <p>Name two examples of lion adaptations.</p> <p><small>Disney</small> AFRICAN CATS</p>	<p>CAN YOU BECOME AN AFRICAN CAT OLYMPIAN?</p> <p>What do we call a trait that helps an animal survive in its environment?</p> <p><small>Disney</small> AFRICAN CATS</p>
<p>WHAT'S IN A HABITAT?</p> <p>Name the four requirements that every animal needs to survive.</p> <p><small>Disney</small> AFRICAN CATS</p>	<p>CAN YOU BECOME AN AFRICAN CAT OLYMPIAN?</p> <p>What does a cheetah's long, thin legs and semi-retractable claws help them do?</p> <p><small>Disney</small> AFRICAN CATS</p>
<p>HOW DOES ENERGY FLOW THROUGH AN AFRICAN SAVANNA?</p> <p>What term describes how food chains are connected in an ecosystem?</p> <p><small>Disney</small> AFRICAN CATS</p>	<p>HOW DOES ENERGY FLOW THROUGH AN AFRICAN SAVANNA?</p> <p>What term describes how energy flows from plants to animals?</p> <p><small>Disney</small> AFRICAN CATS</p>
<p>HOW DOES ENERGY FLOW THROUGH AN AFRICAN SAVANNA?</p> <p>Fill in the missing piece of this food chain: sun → _____ → zebra → lion</p> <p><small>Disney</small> AFRICAN CATS</p>	<p>HOW DOES ENERGY FLOW THROUGH AN AFRICAN SAVANNA?</p> <p>A food pyramid shows energy transfer in a habitat. Which group is on the bottom of a savanna food pyramid?</p> <p><small>Disney</small> AFRICAN CATS</p>
<p>HOW DO RESEARCHERS STUDY AFRICAN CATS?</p> <p>Which animal makes a chirping sound?</p> <p><small>Disney</small> AFRICAN CATS</p>	<p>HOW DO RESEARCHERS STUDY AFRICAN CATS?</p> <p>What is one way that scientists study lions and cheetahs in the wild?</p> <p><small>Disney</small> AFRICAN CATS</p>
<p> HOW CAN I HELP WILDLIFE?</p> <p>Name two ways that you can help wildlife near your home.</p> <p><small>Disney</small> AFRICAN CATS</p>	<p>HOW CAN I HELP WILDLIFE?</p> <p><small>Disney</small> AFRICAN CATS</p>



Disney
AFRICAN CATS

WHERE DO LIONS AND CHEETAHS LIVE?

1

List two countries where cheetahs live.

Disney
nature
**AFRICAN
CATS**



CAN YOU BECOME AN AFRICAN CAT OLYMPIAN?

3

What do we call a trait that helps an animal survive in its environment?

Disney
nature
**AFRICAN
CATS**



CAN YOU BECOME AN AFRICAN CAT OLYMPIAN?

5

What does a cheetah's long, thin legs and semi-retractable claws help them do?

Disney
nature
**AFRICAN
CATS**





WHERE DO LIONS AND CHEETAHS LIVE?

2

List two countries where lions live.

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nature
AFRICAN
CATS



CAN YOU BECOME AN AFRICAN CAT OLYMPIAN?

4

Name two examples of lion adaptations.

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nature
AFRICAN
CATS



WHAT'S IN A HABITAT?

6

Name the four requirements that every animal needs to survive.

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AFRICAN
CATS





HOW DOES ENERGY FLOW THROUGH AN AFRICAN SAVANNA?

7

What term describes how energy flows from plants to animals?

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**AFRICAN
CATS**

**HOW DOES ENERGY FLOW THROUGH AN AFRICAN SAVANNA?**

9

A food pyramid shows energy transfer in a habitat. Which group is on the bottom of a savanna food pyramid?

Disney
nature
**AFRICAN
CATS**

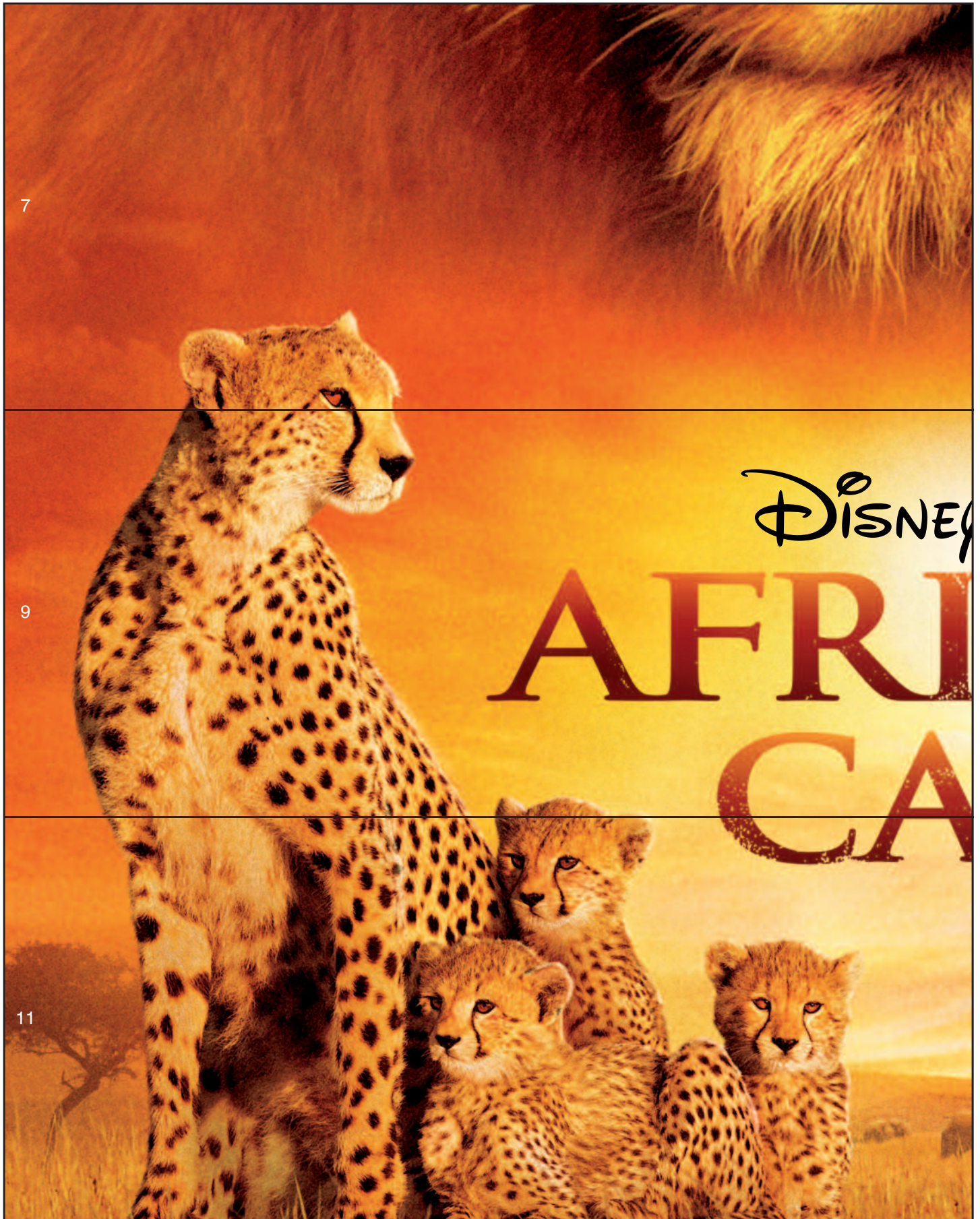
**HOW DO RESEARCHERS STUDY AFRICAN CATS?**

11

What is one way that scientists study lions and cheetahs in the wild?

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CATS**





HOW DOES ENERGY FLOW THROUGH AN AFRICAN SAVANNA?

8

What term describes how food chains are connected in an ecosystem?

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CATS**



HOW DOES ENERGY FLOW THROUGH AN AFRICAN SAVANNA?

10

Fill in the missing piece of this food chain:

sun → _____ → zebra → lion

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CATS**

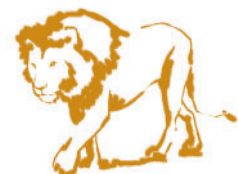


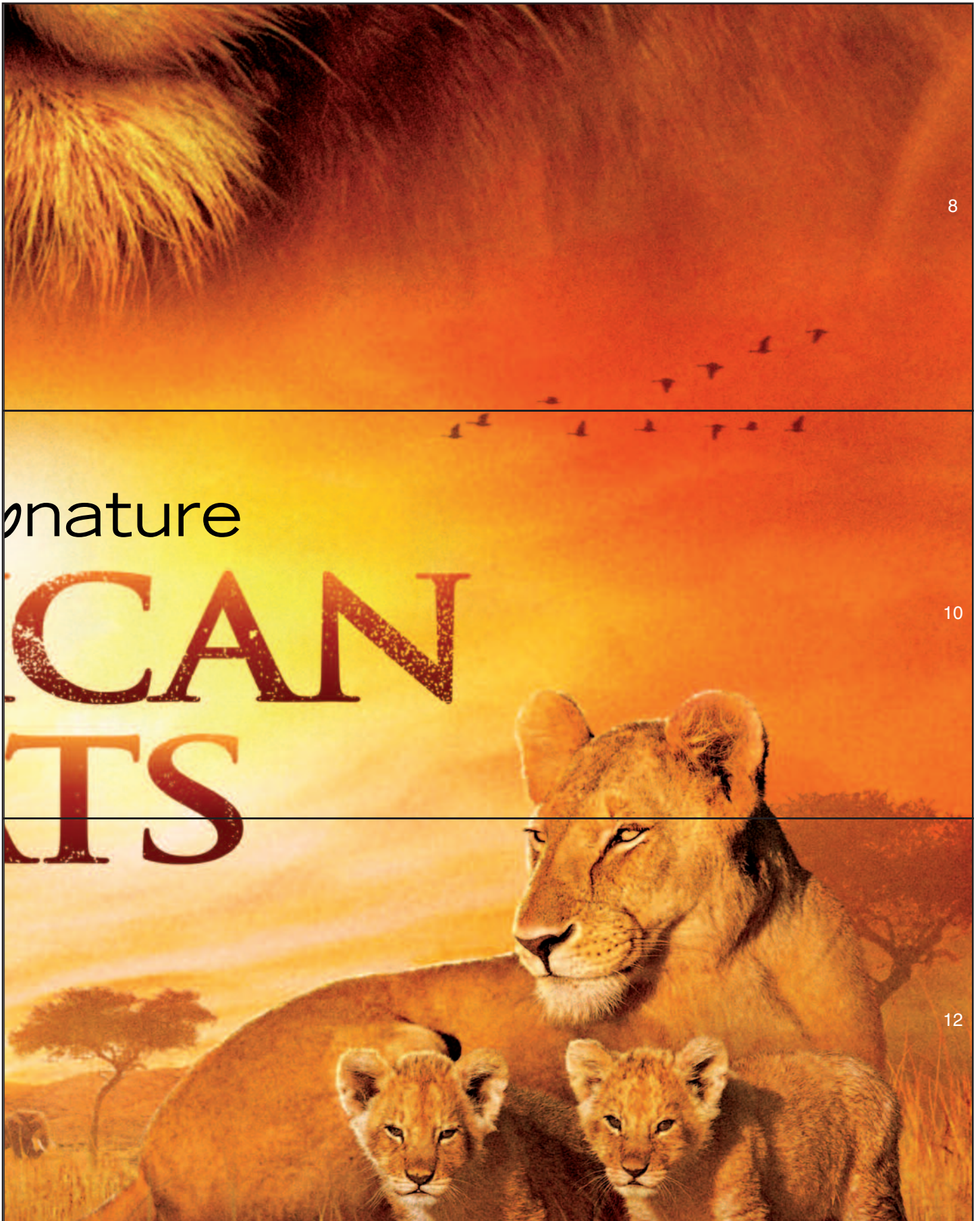
HOW DO RESEARCHERS STUDY AFRICAN CATS?

12

Which animal makes a chirping sound?

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**AFRICAN
CATS**





8

10

12

HOW CAN I HELP WILDLIFE?

13

**Name two ways that you can help
wildlife near your home.**

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**AFRICAN
CATS**



14



See AFRICAN CATS during opening week, and Disney
nature will make a donation in your honor to protect lions
and cheetahs and the land they call their home.
To learn more, visit www.disney.com/africancats.



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CATS**

13

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DISNEYNATURE PRESENTS "AFRICAN CATS" A BIG CAT PRODUCTION MUSIC BY NICHOLAS HOOPER

th Day • April 22

14

CEDED BY KEITH SCHOLEY AND ALIX TIDMARSH DIRECTED BY KEITH SCHOLEY AND ALASTAIR FOTHERGILL Disneynature

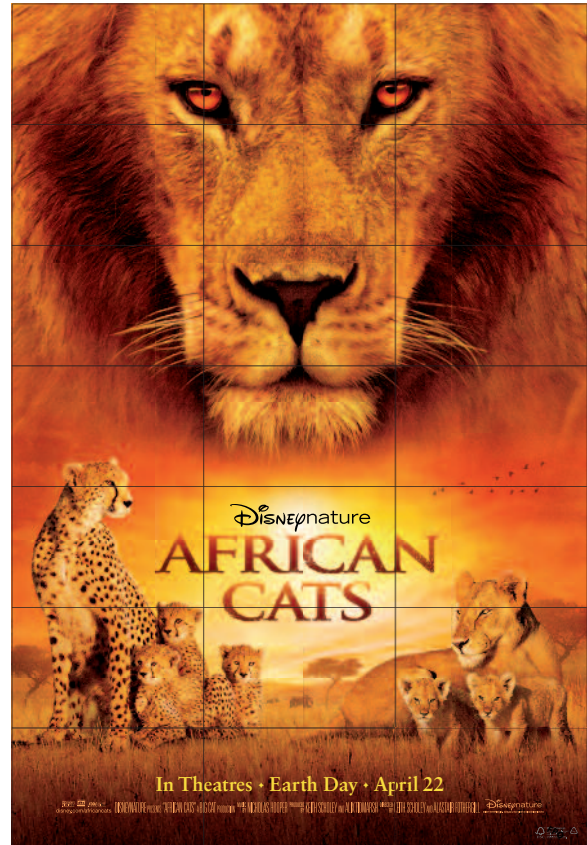
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BIG IDEAS FOR BIG CATS

Grades 4-6

Copy pages 111–122. Cut along the outer edge of each card set and glue each front set to it's corresponding back set. Then, cut the cards apart. There are 14 cards in all. Each card will have a question on the front and a piece of an image on the back. Be sure the correct fronts match to the correct backs. As your class answers each question successfully, create the movie poster below by taping the cards together.

<p>CAN YOU BECOME AN AFRICAN CAT OLYMPIAN?</p> <p>What do you call a trait that helps an animal to survive in its environment?</p>	<p>WHERE DO LIONS AND CHEETAHS LIVE?</p> <p>Name three countries where lions live.</p>	<p>WHERE DO LIONS AND CHEETAHS LIVE?</p> <p>List three countries where cheetahs live.</p>
<p>CAN YOU BECOME AN AFRICAN CAT OLYMPIAN?</p> <p>What adaptation helps a cheetah grip the ground while sprinting?</p>	<p>CAN YOU BECOME AN AFRICAN CAT OLYMPIAN?</p> <p>What adaptation helps a cheetah balance while making sharp turns at high speeds?</p>	<p>CAN YOU BECOME AN AFRICAN CAT OLYMPIAN?</p> <p>What adaptation helps a lion blend in with grasses while stalking prey?</p>
<p>WHO IS PART OF THE SAVANNA FOOD WEB?</p> <p>What term best describes how energy flows from plants to consumers?</p>	<p>WHAT DO LIONS AND CHEETAHS NEED TO SURVIVE?</p> <p>An animal that is food for another animal is called what?</p>	<p>WHAT DO LIONS AND CHEETAHS NEED TO SURVIVE?</p> <p>What is the name of an animal that catches and eats other animals for food?</p>
<p>WHO IS PART OF THE SAVANNA FOOD WEB?</p> <p>Fill in the missing piece of this food chain: carnivore → _____ → top predator</p>	<p>WHO IS PART OF THE SAVANNA FOOD WEB?</p> <p>What is an organism that is neither a plant nor an animal and gets its energy from breaking down other organisms?</p>	<p>WHO IS PART OF THE SAVANNA FOOD WEB?</p> <p>What term best describes how food chains in an ecosystem are connected and overlap?</p>
<p>WHAT TECHNOLOGY DO RESEARCHERS USE TO STUDY AFRICAN CATS?</p> <p>List two tools that researchers use to study African cats.</p>	<p>HOW DO LIONS AND CHEETAHS SPEND THEIR DAY?</p> <p>What tool do researchers use to study African cat behaviors?</p>	<p>HOW DO LIONS AND CHEETAHS SPEND THEIR DAY?</p> <p>What behavior makes up the largest portion of a lion activity cycle?</p>
<p>WHAT ARE THE THREATS TO CHEETAHS AND LIONS IN THE WILD?</p> <p>List two threats to cheetahs and lions in the wild.</p>	<p>WHAT TECHNOLOGY DO RESEARCHERS USE TO STUDY AFRICAN CATS?</p> <p>What can researchers learn about African cats from GPS data?</p>	<p>WHAT TECHNOLOGY DO RESEARCHERS USE TO STUDY AFRICAN CATS?</p> <p>What can researchers learn from using a camera trap?</p>
<p>HOW DO SCIENCE-BASED CONSERVATION SOLUTIONS PROTECT AFRICAN CATS?</p> <p>List two conservation solutions to help lions and cheetahs in the wild.</p>	<p>HOW DO SCIENCE-BASED CONSERVATION SOLUTIONS PROTECT AFRICAN CATS?</p> <p>How does scientific research help protect African cats?</p>	<p>WHAT ARE THE THREATS TO CHEETAHS AND LIONS IN THE WILD?</p> <p>Why is the development of farmland and ranches a threat to lions and cheetahs?</p>



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WHERE DO LIONS AND CHEETAHS LIVE?

2

Name three countries where lions live.



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CATS**

WHERE DO LIONS AND CHEETAHS LIVE?

1

List three countries where cheetahs live.



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CATS**

CAN YOU BECOME AN AFRICAN CAT OLYMPIAN?

5

What adaptation helps a cheetah balance while making sharp turns at high speeds?



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**AFRICAN
CATS**

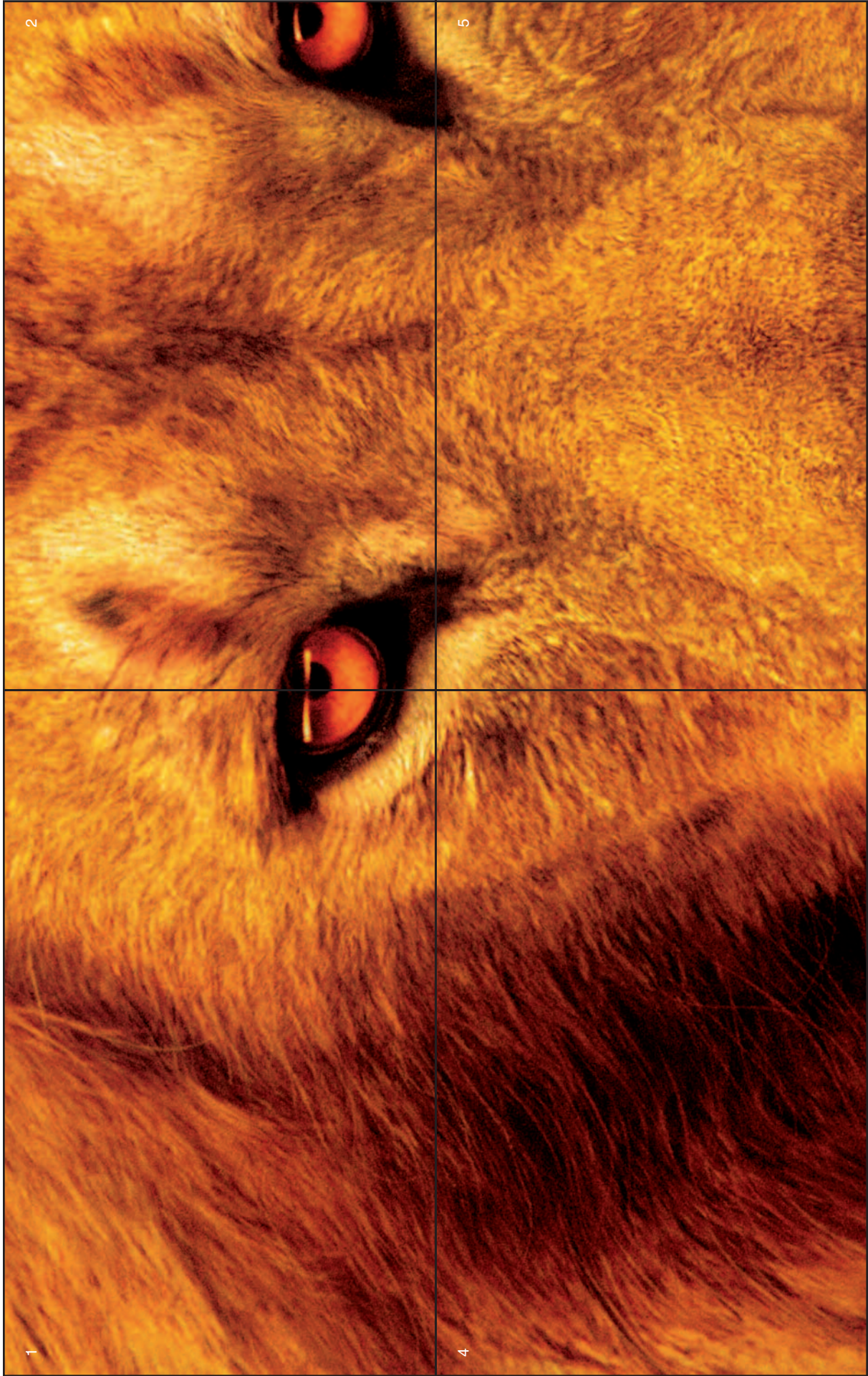
CAN YOU BECOME AN AFRICAN CAT OLYMPIAN?

4

What adaptation helps a lion blend in with grasses while stalking prey?



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CATS**



CAN YOU BECOME AN AFRICAN CAT OLYMPIAN?

3

What do you call a trait that helps an animal to survive in its environment?

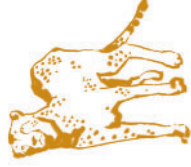


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WHAT DO LIONS AND CHEETAHS NEEDS TO SURVIVE?

7

What is the name of an animal that catches and eats other animals for food?



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CATS**

CAN YOU BECOME AN AFRICAN CAT OLYMPIAN?

6

What adaptation helps a cheetah grip the ground while sprinting?



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CATS**

WHO IS PART OF THE SAVANNA FOOD WEB?

10

What term best describes how food chains in an ecosystem are connected and overlap?



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CATS**



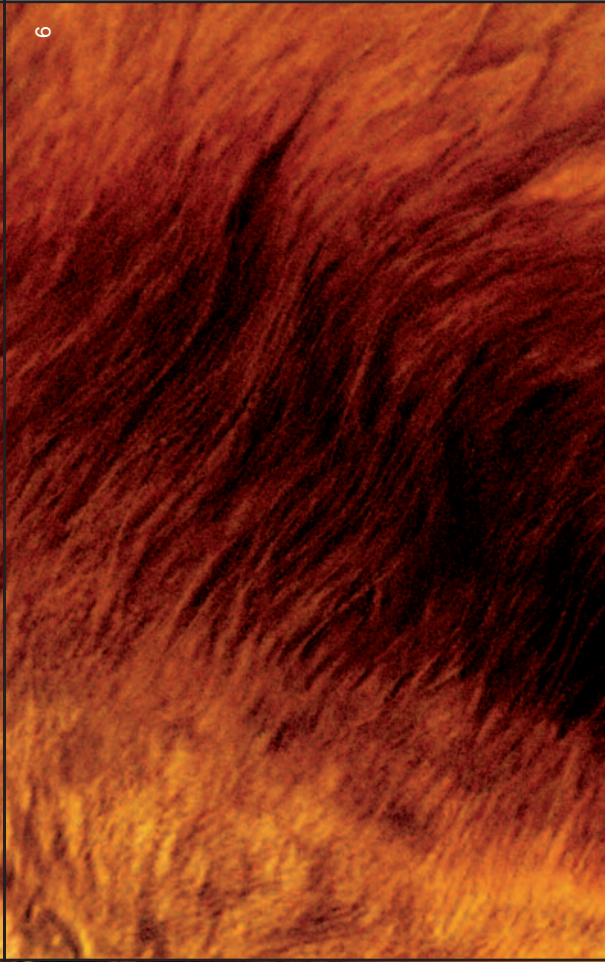
7



3



10



6

WHO IS PART OF THE SAVANNA FOOD WEB?

9

What term best describes how energy flows from plants to consumers?



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**AFRICAN
CATS**

WHAT DO LIONS AND CHEETAHS NEEDS TO SURVIVE?

8

An animal that is food for another animal is called what?



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**AFRICAN
CATS**

WHO IS PART OF THE SAVANNA FOOD WEB?

12

Fill in the missing piece of this food chain:

carrion → fungus → ____ → lappet faced vulture



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**AFRICAN
CATS**

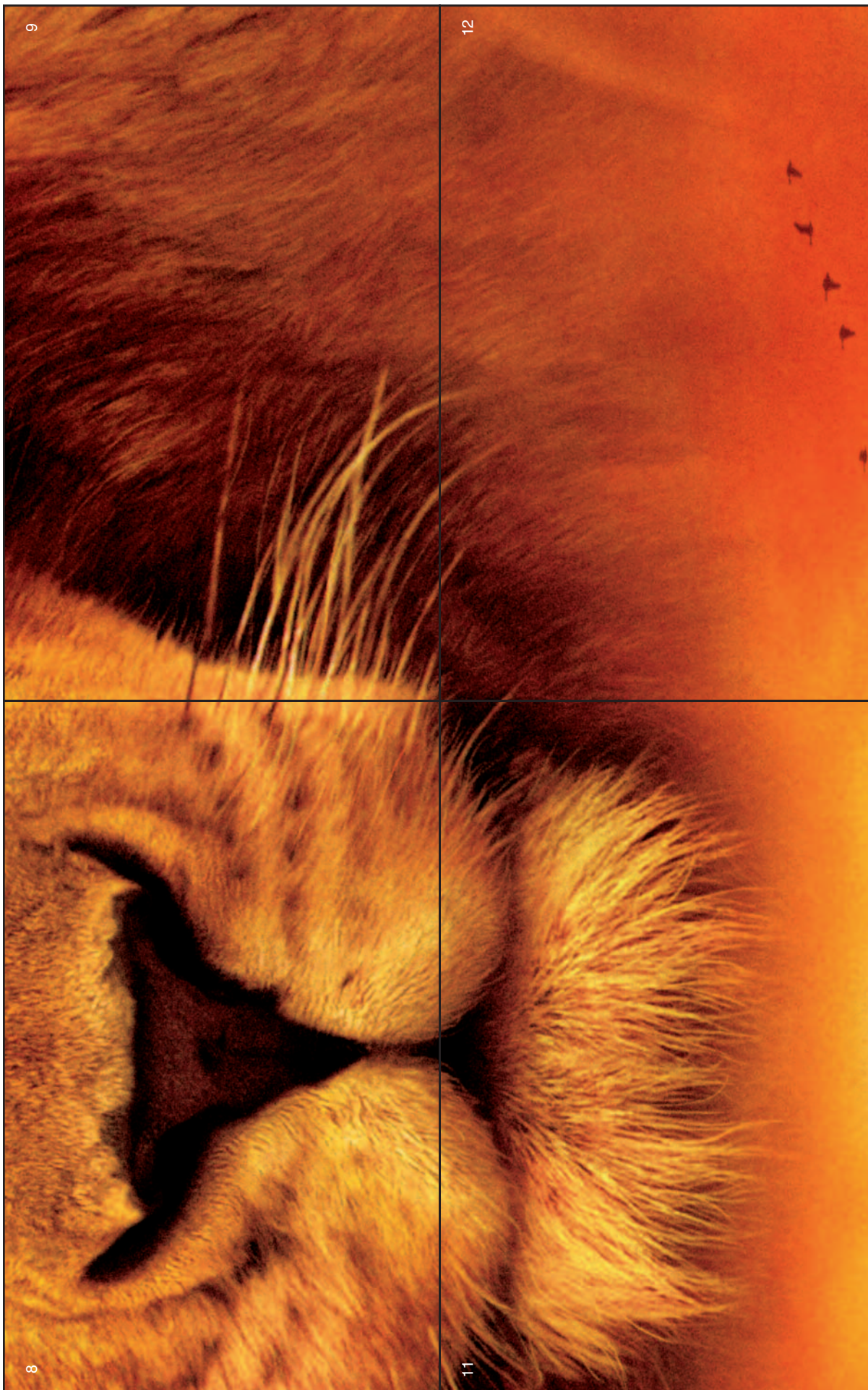
WHO IS PART OF THE SAVANNA FOOD WEB?

11

What is an organism that is neither a plant nor an animal and gets its energy from breaking down other organisms?



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CATS**



HOW DO LIONS AND CHEETAHS SPEND THEIR DAY?

14

What tool do researchers use to study African cat behaviors?



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CATS**

HOW DO LIONS AND CHEETAHS SPEND THEIR DAY?

13

What behavior makes up the largest portion of a lion activity cycle?



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CATS**

WHAT TECHNOLOGY DO RESEARCHERS USE TO STUDY AFRICAN CATS?

17

What can researchers learn about African cats from GPS data?



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**AFRICAN
CATS**

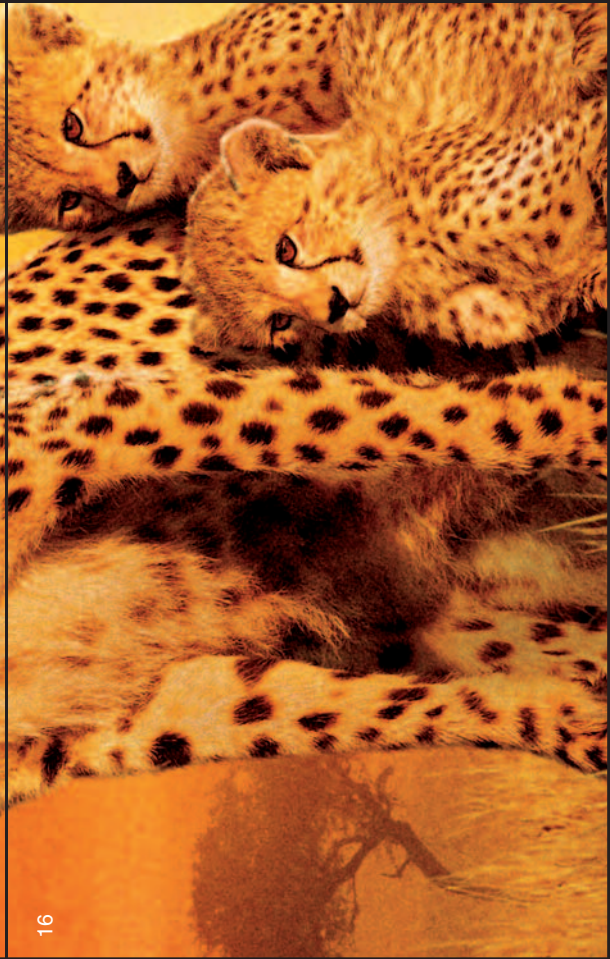
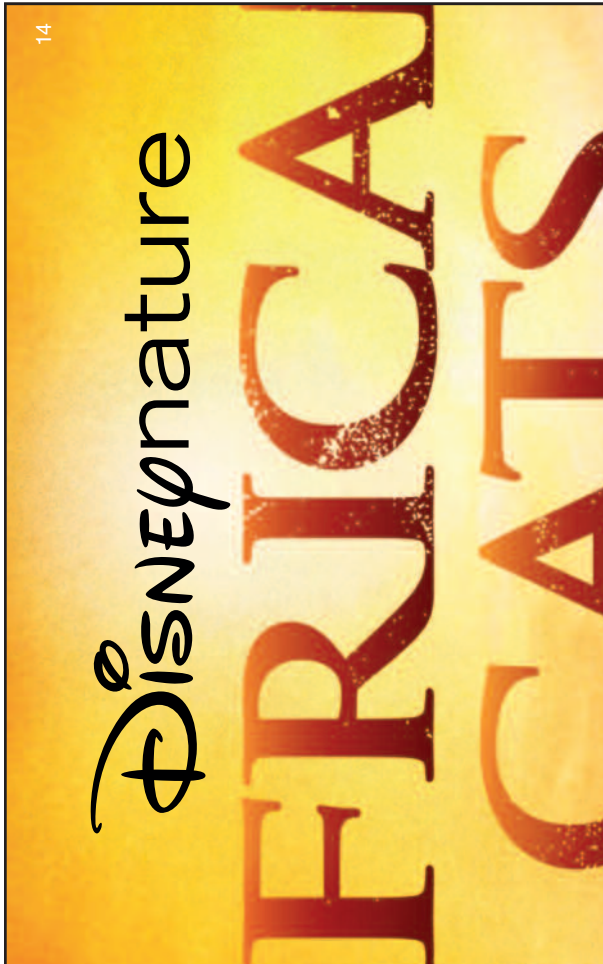
WHAT TECHNOLOGY DO RESEARCHERS USE TO STUDY AFRICAN CATS?

16

What can researchers learn from using a camera trap?



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**WHAT ARE THE THREATS TO CHEETAHS
AND LIONS IN THE WILD?**

19

**Why is the development of
farmland and ranches a threat to
lions and cheetahs?**



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**WHAT TECHNOLOGY DO RESEARCHERS
USE TO STUDY AFRICAN CATS?**

15

**List two tools that
researchers use to study
African cats.**



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CATS**

**HOW DO SCIENCE-BASED CONSERVATION
SOLUTIONS PROTECT AFRICAN CATS?**

20

**How does scientific
research help protect
African cats?**



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CATS**

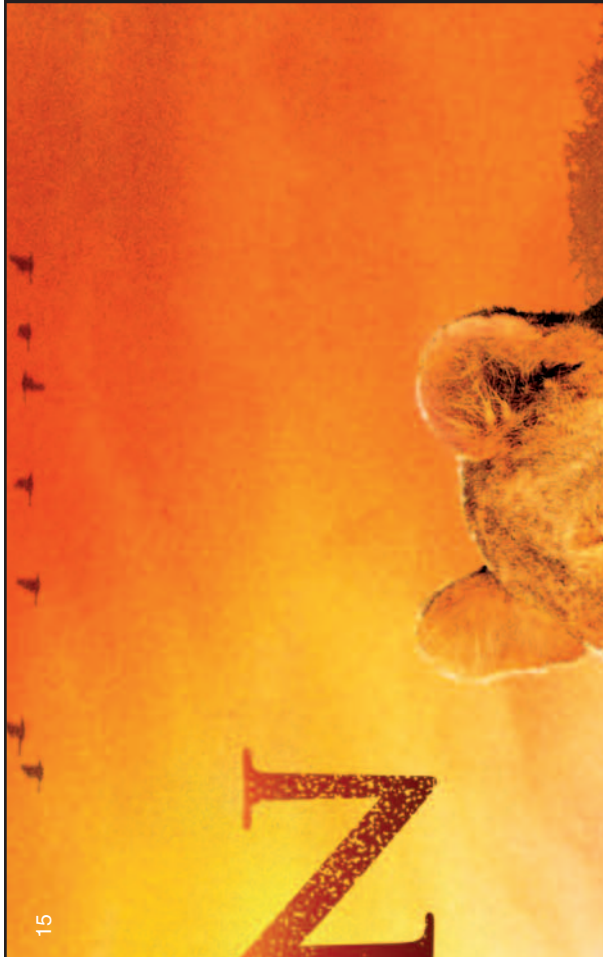
**WHAT ARE THE THREATS TO CHEETAHS
AND LIONS IN THE WILD?**

18

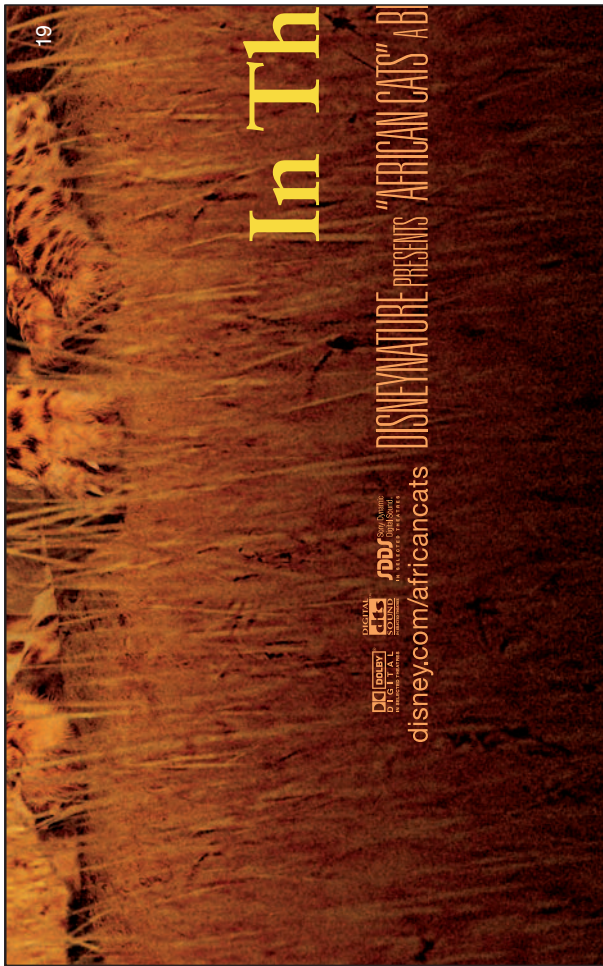
**List two threats to cheetahs
and lions in the wild.**



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CATS**



15



19

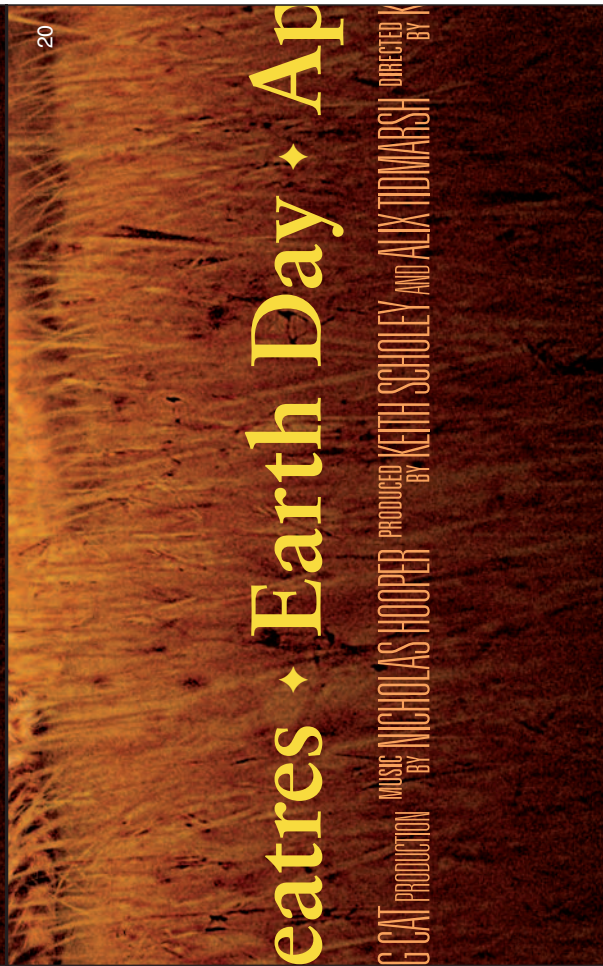


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18



20

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**HOW DO SCIENCE-BASED CONSERVATION
SOLUTIONS PROTECT AFRICAN CATS?**

21

**List two conservation solutions
to help lions and cheetahs
in the wild.**



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CATS**

