# SOUNDS OF THE SAVANNA

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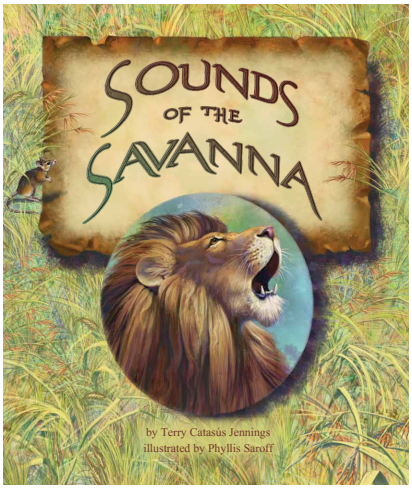
## ABOUT THE BOOK




From the first light of dawn until the sun sets at night, the savanna is alive with sound. A lion roars in early morning claiming his territory. Elephants rumble to communicate with far away herds. Bats zero in on their dinner using high frequency pings. Stealthy predators stalk squealing, shrieking, and screeching prey. Through the sounds of the savanna readers explore sound in an engaging manner: how we make it, how animals use it, pitch, volume, echo location and even temperature refraction. But that's not all. *Sounds of the Savanna* listens in on prey and predator interactions, showing a realistic view of life and many surprises about the dwellers of the savanna. It also provides a launching point to discussions on animal adaptations and the realities of life in the jungle/savanna.

For core standards to which *Sounds* is aligned, please visit: http://www.arbordalepublishing.com/Standards.php

For publisher's teacher guides and activities on sound, please visit: http://www.arbordalepublishing.com/documents/TeachingActivities/SoundsSavanna

## Pre-Reading Discussion

Ask students to share what they know about sound—how it's made, how we use sound to communicate, how animals might use sound. Discuss the food web and prey/predator interactions—what sounds do predators make, what sounds do prey make, why? Remind students of what they already know about music—pitch and volume.

## Discussion

Sound is vital on the savanna. Think of the baby baboon in the story. Without sound, it would have been lunch for the preying stranger. A zebra that gets a whiff of a predator as it grazes might survive, but what about the rest of the herd? Without sound, other members of the group would be clueless and more vulnerable to an attack. In the savanna, sound communicates alarm, but it does so much more.

The African savanna, like those in South America, India, Australia, Thailand, and Madagascar, is a warm ecosystem of open grassy plains dotted with drought-resistant shrubs and trees.

Sunlight bathes the grass and although the weather is normally warm, there are dry seasons and wet seasons. Herds of gazelles, zebras, elephants, wildebeests graze on the tall grass, the leaves of low shrubs, roots, bulbs, even bark. They are herbivores. Lionesses, leopards and cheetahs, using the tall grass as cover, stalk the herbivores. They are carnivores—predators—and the herbivores are their prey. Troops of monkeys move from

the tree tops to the grasslands. Many of them eat grasses and fruits, but they also eat insects, and baby birds, and, like the baboon, maybe even the young of their own kind.

These are omnivores, like man. They will be prey to a lion or a leopard, but they are predators to insects and smaller animals.

Size is not a determinant on what animals are predators or prey. Tiny insects like dragon flies and praying mantis are carnivores—they are predators like the ladybugs we love so much. Some birds are predators as well. In the savanna, the secretary bird is a carnivore. The robin in our front yard, pulling up a worm is a carnivore and predator as well. Elephants, rhinos and hippos, because of their size as adults, are less vulnerable to predators than smaller game. Apex predators like lions, cheetahs, and leopards, are not subject to being prey as healthy adults. But all animals have to be wary of predators, if not for themselves, for their young.

**USING THE SENSES** Animals use three senses to protect themselves and their families from predators. They keep a look out for predators. In some species, sentries are responsible for surveillance and giving the alarm. They use the sense of smell to catch the scent of an approaching predator, and they use the sense of hearing—a sound, like the crack of a breaking branch can alert them. But predators are sneaky. They use the cover of the tall grasses and their coloration to slip close to a heard or unsuspecting animal, undetected by peering eyes. They remain upwind of prey so their scent doesn't reach their target. They creep quietly, padding on silent feet, or swooping down on noiseless wings, to surprise their quarry.

**ANIMALS USE SOUND** Animals in the savanna, in the jungle and in all situations use sound to communicate. Their communications are what they need to carry on life.

Some sounds are for contact. Elephants rumble at very, very low frequencies—frequencies humans can't hear but carry for between four and 10 kilometers—to get in touch with other members of their herd or family. In family groups, elephants recognize the voice of relatives, even if the relatives are or have been far away.

Other sounds are to alert members of the other sex they are ready for mating. Some sounds show aggression, some sounds show contentment. The most vital function of sound is in hunting for food and in getting away from predators.

**USING SOUND TO HUNT** Bats and owls hunt in the dark. Bats use echo location to find their prey. They emit pings in very high frequencies (high pitch). When the pings bounce off the prey and the sound echoes back to the bat, its brain can calculate exactly where its next dinner will be. Owls also use sound to hunt. Their hearing is so precise that they can tell the difference in time in receiving the sound from one ear to the next. They use this difference to triangulate and find exactly where their prey is rustling leaves as it walks. Some owls have ears that are asymmetrical, not at the same level. They use this adaptation to measure, in the same way, where the prey is on the vertical plane. Another adaptation owls have is their dish shaped face—like a radar dish—the owl's face directs the sound to its ears very, very precisely.

**USING SOUND TO GET AWAY.** All prey use sound to communicate alarm, to alert offspring or other members of the herd or troop that danger is near. Sound is the first step. Once they become aware of danger, prey can engage their other tools, like speed or closing together to protect their young. While some predators, like cheetahs are extremely fast, they cannot sustain that speed for as long as their prey. Some prey in the savanna have developed advanced adaptations. Vervet monkeys and baboons have specific vocalizations for different prey. While elephants rumble in low frequencies to communicate over long distances, they use high frequency trumpeting to warn of danger.

**EVERYONE DESERVES TO EAT.** Humans kill to eat. Predators are no different. It's a sad reality, but in order to survive as an individual and as a species, some in the savanna must kill. They kill to survive, themselves, and they kill to feed their offspring. But predators aren't always successful. In Africa, the African Wild Dog is the most successful predator. It hunts in groups and has about a 90% success rate. Lions, on the other hand, only have about a 20-25% success rate. Wild dogs, hyenas and lions hunt in groups. They can bring down bigger prey that way. Leopards and cheetahs hunt alone. They stalk and kill smaller prey like gazelles. Predators have to weigh the cost in energy of the chase, to the benefit in energy of the kill. Cheetahs, and leopards stalk their prey or wait patiently for them until the prey is about 40 meters (about 120 feet) away. Cheetahs will chase their prey in a burst of speed, but they will only sustain that for about 300 meters (.18 mile). It may be their extreme speed raises their body temperature too much to sustain for long periods. Definitely, the energy spent in that chase is extreme. Amazingly enough, the most successful predator, with a 95% success rate is the dragonfly. It comes upon its prey from behind and below affording itself maximum surprise.

## COOL FACTS:

1. Sound is refracted by temperature changes in the atmosphere. Sound travels from warmer temperatures to cooler temperatures. Early in the day, sound will rise until it reaches about 15km. At that point, the temperature of the atmosphere is again about the same as on the surface of the earth and the sound wave bounces back to earth. It will not bounce directly back, but it will bounce at an angle. This is how the lioness' roar can be heard by the wildebeests across the lake as if they are right next to each other. (During the eruption of Mount St. Helens, there was no sound at the site of the eruption, but about 20 minutes later it was heard in cities 60 miles away.
2. Egyptian Spiny Mice have developed an adaptation that allows their skin to break off when grasped by a predator. The skin begins to regenerate right away and within 48 hours it has completely regrown including hair. No evidence of the break is present.
3. Some moths which are hunted by bats have developed an adaptation to "jam" the bats' radar. When they hear the bats' high pitched pings, they emit sounds at the same frequency as the bats and confuse the predator so the moth can escape. On the same vein, there are other bats that similarly jam their friends' radar to decrease the competition for prey.

## QUESTIONS TO PONDER:

- Why do animals hunt?
- What senses do animals use to protect themselves from predators?
- What insects are predators?
- What birds are predators?
- For what reasons do animals use sound to communicate?
- How do we humans use sound to communicate?
- Can you think of a time your mother may have sounded a high pitched alarm?
- What senses do humans use to avoid danger?
- What other animal adaptations can you think about that help animals survive?

## WRITING ACTIVITIES - SHORT PROMPT:

- What effect do you think humans will have in a savanna ecosystem?
- Who do you root for—predators or prey?
- Why are predators necessary?
- Imagine life without sound.

## WRITING ACTIVITIES - ESSAYS:

### Follow your favorite predator through an unsuccessful chase—non-fiction

Find facts about your favorite predator. What are its daily habits? How does it live? Which animals does it hunt? How does it hunt? Is it a solitary hunter or does it hunt in groups? Are there any tricks this animal uses to outwit its prey? Find out about how it cares for its babies. Now find out about your predator's favorite prey. What are its habits? How does it outwit predators? How do members of the group communicate? How do they take care of their babies? Find out about the savanna, what it looks like, what it feels like. After you have the facts above and any other cool facts you may find, write a straight non-fiction report from the point of view of the predator during a failed chase.

### Follow your favorite prey through an unsuccessful chase—creative non-fiction

Find out facts about your favorite prey and predator, using the suggestions above and write a story based on those facts. "Get in the head" of your predator and and write about how they might feel.

### Follow your favorite prey through an unsuccessful chase—non-fiction

Find facts about your favorite prey. What are its daily habits? How does it live? How does it outwit predators? How do members of the group communicate? How do they take care of their babies? Now find out about a predator which hunts your prey. How does it hunt? Is it a solitary hunter or does it hunt in groups? Are there any tricks this animal uses to outwit its prey? Find out about the savanna, what it looks like, what it feels like. After you have the facts above and any other cool facts you may find, write a straight non-fiction report from the point of view of the prey about getting away from a predator.

### Follow your favorite prey through an unsuccessful chase—creative non-fiction

Find out facts about your favorite prey and predator, using the suggestions above and write a story based on those facts. "Get in the head" of your prey and write about how they might feel.

### Follow your favorite animal through a day on the savanna (non-fiction)

Using the suggestions above, write a non-fiction report about the day of your favorite animal on the savanna.

### Follow your favorite animal through a day on the savanna—creative non-fiction

Using the suggestions above, write a story based on those facts about the day of your favorite animal on the savanna.

## MORE INFORMATION:

### From Arbordale Publishers:

Type to enter textFor Creative Minds: http://www.sylvandellpublishing.com/ForCreativeMinds/GopherRescue_FCM.pdf

Teaching Activities Guide: http://www.sylvandellpublishing.com/documents/TeachingActivities/GopherRescue_TA.pdf

Quizzes: http://www.sylvandellpublishing.com/quize.php?title_id=114&q_type=1; http://www.sylvandellpublishing.com/quize.php?title_id=114&q_type=2;http://www.sylvandellpublishing.com/quize.php?title_id=114&q_type=3

### Author's Website:

http://www.terrycjennings.com/Teacher-Resources-Sounds.html,

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