

# Explore Mammals & Their Environments

## OVERVIEW

Students will observe physical features and explore how mammals compete with one another for food.

### New York State Science Curriculum

**LE 3.2a** In all environments, organisms with similar needs may compete with one another for resources.

## BACKGROUND FOR EDUCATOR

Carnivorans\* are a distinct group of mammals. They can be found in every kind of environment, from snow-capped mountains to the hottest desert. Because they share a common ancestor, carnivorans share certain features such as bladelike teeth and sharp claws. Species with similar adaptations have some similar needs (e.g. most carnivorans are meat-eaters), but they also have differences. These differences help allow each species to survive in their particular environment.

\*Refer to the Essential Questions to clarify the difference between carnivoran and carnivore.

## BEFORE YOUR VISIT

### Activity: Mammals & Their Food

Show students pictures of a cat and a dog. Have them observe the animals and make a list of the body parts, or features (e.g. eyes, fur, teeth, legs). Then ask students to think about how each feature would help the animal survive if it lived in the wild. (*Answers may include: The cat's claws would help it catch prey. The dog's nose would help it track and hunt prey.*) What other animals might it compete with for food? (*Answers may include: raccoon, fox, coyote*)

Point out to students that both cats and dogs are mammals. In particular, they belong to a group of mammals known as "carnivorans." Tell students that at the Museum, they will explore bigger cats and dogs, such as jaguars and wolves, that live in different parts of North America.

### Plan how your students will explore the Hall of North American Mammals using the student worksheets.

There are two worksheets: A and B. You might choose to divide your class into two groups, so that half the class is exploring cats (A) and the other half is exploring dogs (B). Or you might choose to have all students explore both cats and dogs.

Distribute copies of the student worksheets to students before coming to the Museum. You may want to review the worksheets with them to make sure they understand what they are to do.

## DURING YOUR VISIT

### Hall of North American Mammals

1st floor (30-45 minutes)

Have students use the student worksheets to explore carnivorans and the competition of resources. Divide your class into two groups. Have one group use Worksheet A to explore the cats (jaguar, mountain lion, and lynx) and the other group use Worksheet B to explore the dogs (wolf, coyote, and fox).

## Akeley Hall of African Mammals

2nd floor (20-30 minutes)

Visit the upper level of this hall to explore the mammals of Africa. Invite students to identify the carnivorans. (*Answers: cheetah, leopard, African wild dog, jackal, and hyena*) Then have them compare the African carnivorans to those in the Hall of North American Mammals to determine which animals are more closely related to the cats (felids) or dogs (canids). (*Answers: The wild dog and jackal are dogs. The cheetah and leopard are cats, and the hyena is closely related to felids. Note that despite the hyena's doglike appearance, detailed examination of skulls and teeth, as well as modern molecular studies, show that the hyena is actually more closely related to cats than dogs.*)

## BACK IN THE CLASSROOM

### Activity: Mammals & Their Resources

Divide your class into small groups that looked at the same set of carnivorans in the Museum (cats or dogs). Ask them to review their worksheets and combine their data to create a group list of (1) features, (2) its diet, and (3) its environment.

Distribute maps that illustrate the range of their carnivorans. Have students compare and contrast the maps. Ask them to discuss:

- Which carnivorans share some of their range with each other?  
(*Answers will vary, and may include: The range of the mountain lion overlaps with both the lynx and the jaguar. The coyote, wolf, and fox all overlap to some extent.*)
- Do you think each predator in the overlapping zone has a different behavior or diet than the other(s)?  
(*Answer: Yes, this is how they are able to share the same range, by partitioning their resources.*)
- How do you think interactions with the other two carnivorans change its behavior or diet?  
(*Answers: A predator has to be more limited in its available prey if it competes with another predator. For example, coyotes have to live on smaller prey if wolves are around.*)

After group discussion, create a class list of data, and compare the cats and dogs.

## ONLINE RESOURCES

### Moving Mammals

[amnh.org/ology/movingmammals](http://amnh.org/ology/movingmammals)

Play this interactive to see how fast, and slow, mammals can move.

### Super Teeth

[amnh.org/ology/superteeth](http://amnh.org/ology/superteeth)

Explore the four types of mammal teeth: incisors, canines, premolars, and molars.

### In Pictures: Extreme Mammals

[amnh.org/ology/pics\\_extrememammals](http://amnh.org/ology/pics_extrememammals)

From the extinct *Cynognathus* and *Repenomamus* to the plant-eating dugongs and manatees, explore some of Earth's most unusual mammals.

### Extreme Mammals Exhibition

[amnh.org/extrememammals](http://amnh.org/extrememammals)

Check out the biggest, smallest, and most amazing mammals of all time.

## Explore Mammals & Their Environments

**Visit three dioramas:**

- Jaguar
- Mountain Lion
- Lynx

**1. Draw each mammal** on a separate piece of paper. They belong to a distinct group of mammals called Carnivora (carnivorans).

**2. Observe the carnivorans' physical features** and describe them below. Come up with your own features to complete the table (it has a few to get you started).

Feature	Jaguar	Mountain Lion	Lynx
size			
build			
fur length			
leg length			

**3. What do you think each predator would eat?**

Jaguar would eat:	Mountain lion would eat:	Lynx would eat:

**4. Describe their environment.** For example, what kinds of vegetation do you see? Does the place look wet or dry? Are there other animals in the diorama

Jaguar's environment:	Mountain lion's environment:	Lynx's environment:

**5. Think about it.**

If the jaguar, mountain lion, and lynx lived in the same area, do you think they would eat the same thing? Why or why not?

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If they're trying to hunt the same thing, what do you think would happen?

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**ANSWER KEY**

**Explore Mammals & Their Environments**

1. **Draw each mammal** on a separate piece of paper. They belong to a distinct group of mammals called Carnivora (carnivorans).

**Visit three dioramas:**

- Jaguar
- Mountain Lion
- Lynx

2. **Observe the carnivorans' physical features** and describe them below. Come up with your own features to complete the table (it has a few to get you started).

Feature	Jaguar	Mountain Lion	Lynx
size	<i>(Answer: large)</i>	<i>(Answer: large)</i>	<i>(Answer: small)</i>
build	<i>(Answer: stocky)</i>	<i>(Answer: slim)</i>	<i>(Answer: it's fluffy and hard to tell)</i>
fur length	<i>(Answer: short)</i>	<i>(Answer: short)</i>	<i>(Answer: long)</i>
leg length	<i>(Answer: short)</i>	<i>(Answer: long)</i>	<i>(Answer: short)</i>

# ANSWER KEY

### 3. What do you think each predator would eat?

<p>Jaguar would eat: <i>(Answers may include: deer)</i></p>	<p>Mountain lion would eat: <i>(Answers may include: deer, rabbits, squirrels)</i></p>	<p>Lynx would eat: <i>(Answers may include: hare, birds, deer, foxes)</i></p>
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### 4. Describe their environment.

For example, what kinds of vegetation do you see? Does the place look wet or dry? Are there other animals in the diorama

<p>Jaguar's environment: <i>(Answers may include: dry and rocky valley, with plants like cactus)</i></p>	<p>Mountain lion's environment: <i>(Answers may include: Grand Canyon—rocky, dry, very few plants like the cactus)</i></p>	<p>Lynx's environment: <i>(Answers may include: snowy mountaintop with lots of pine; there's a hare hiding under a bush)</i></p>
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### 5. Think about it.

If the jaguar, mountain lion, and lynx lived in the same area, do you think they would eat the same thing? Why or why not?

*(Answers may include: Yes. They have a lot of prey in common. The jaguar and mountain lion both hunt*

*larger animals like deer, and the mountain lion and lynx both hunt smaller animals like rabbits.)*

If they're trying to hunt the same thing, what do you think would happen?

*(Answers may include: The jaguar will probably be more successful than the mountain in hunting the*

*larger prey, while the mountain would be better than the lynx in hunting the smaller prey.)*

## Explore Mammals & Their Environments

**1. Draw each mammal** on a separate piece of paper. They belong to a distinct group of mammals called Carnivora (carnivorans).

**Visit three dioramas:**

- Wolf
- Coyote
- Fox

**2. Observe the carnivorans' physical features** and describe them below. Come up with your own features to complete the table (it has a few to get you started).

Feature	Wolf	Coyote	Fox
size			
build			
fur length			
leg length			

**3. What do you think each predator would eat?**

Wolf would eat:	Coyote would eat:	Fox would eat:
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**4. Describe their environment.** For example, what kinds of vegetation do you see? Does the place look wet or dry? Are there other animals in the diorama?

Wolf's environment:	Coyote's environment:	Fox's environment:
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**5. Think about it.**

If the wolf, coyote, and fox lived in the same area, do you think they would eat the same thing? Why or why not?

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**ANSWER KEY**

**Explore Mammals & Their Environments**

1. Draw each mammal on a separate piece of paper. They belong to a distinct group of mammals called Carnivora (carnivorans).

**Visit three dioramas:**

- Wolf
- Coyote
- Fox

2. Observe the carnivorans' physical features and describe them below. Come up with your own features to complete the table (it has a few to get you started).

Feature	Wolf	Coyote	Fox
size	<i>(Answer: large)</i>	<i>(Answer: medium)</i>	<i>(Answer: small)</i>
build	<i>(Answer: stocky)</i>	<i>(Answer: slim)</i>	<i>(Answer: slim)</i>
fur length	<i>(Answer: long)</i>	<i>(Answer: short)</i>	<i>(Answer: short)</i>
leg length	<i>(Answer: long)</i>	<i>(Answer: long)</i>	<i>(Answer: short)</i>

# ANSWER KEY

### 3. What do you think each predator would eat?

<p>Wolf would eat:</p> <p><i>(Answers may include: deer, chickens, turkeys, rabbits)</i></p>	<p>Coyote would eat:</p> <p><i>(Answers may include: chickens, turkey, rabbits, squirrels, other rodents)</i></p>	<p>Fox would eat:</p> <p><i>(Answers may include: small rodents, some fruit, rabbits)</i></p>
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### 4. Describe their environment.

For example, what kinds of vegetation do you see? Does the place look wet or dry? Are there other animals in the diorama?

<p>Wolf's environment:</p> <p><i>(Answers may include: snowy, open ground)</i></p>	<p>Coyote's environment:</p> <p><i>(Answers may include: mountainous rocky slopes)</i></p>	<p>Fox's environment:</p> <p><i>(Answers may include: forest)</i></p>
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### 5. Think about it.

If the wolf, coyote, and fox lived in the same area, do you think they would eat the same thing? Why or why not?

*(Answers may include: The wolf and coyote both hunt larger animals like the deer and possibly slightly*

*smaller ones like turkeys, groundhogs, and opossums. The coyote and fox would both eat the smaller*

*animals like rodents and rabbits.)*

If they're trying to hunt the same thing, what do you think would happen?

*(Answers may include: The wolf will probably be more successful than the coyote in hunting the larger prey,*

*while the coyote would be better than the fox in hunting the medium-sized prey.)*

## Species Range Maps: Cats

The maps below illustrate the geographical areas where populations of a species can be found.

**Jaguar**



**Mountain Lion**



**Lynx**



## Species Range Maps: Dogs

The maps below illustrate the geographical areas where populations of a species can be found.

**Wolf**



**Coyote**



**Fox**

