Amazing Mammals

GRADES: 3–5

Key Words and Definitions

MAMMAL : an animal of the class Mammalia, characterized by being warm-blooded, having outside ears, having hair and feeding milk to its young.

ADAPTATION : the change or the process of change by which a species becomes better suited to its environment; a structure or behavior that helps an organism to survive in a specific habitat.

HABITAT : the home or environment of an animal, plant or other organism.

NICHE : a specific role an organism plays within its ecosystem or community.

URBAN AVOIDER : an animal that avoids cities.

URBAN EXPLOITER : an animal that takes advantage of city structures and resources.

URBAN ADAPTER : an animal that is able to survive in cities if a more preferable habitat is not available.

*Look for keywords—***BOLDED***—throughout this lesson extension!*

Activity 1: Local Mammal Survey

Long-term, multi-session project; pre-visit

LEARNING OBJECTIVE

Students will identify, collect and interpret data on mammals in their neighborhoods.

MATERIALS

- Mammal surveys
- Graph paper
- Pencils
- Optional: iNaturalist app

PROCEDURE

For this activity, students venture out into their neighborhoods or local parks and look for **MAMMALS** and signs of mammals. Each student is responsible for collecting data on the different mammals they spot in their area and adding it to a larger class list. Using the Mammal Survey worksheet provided, students record information on the local mammals they observe on their way to and from school, during recess or on a class trip to a nearby park. Set the parameters for when and where students collect data. Emphasize the importance of students taking careful notes on their sightings, and remind them that each time they are outside looking for signs of mammals (such as scat, tracks, food scraps, homes or fur-shed) they are acting as field scientists. Instruct students to document the date, description of the location and details about the animal's appearance and behavior for each mammal they observe. *If you are interested in expanding this project, students can also use the iNaturalist app to submit their mammal sightings to a larger database.*

After a few weeks of surveying mammals, the class should have collected enough information to begin analyzing and interpreting the data. Have students determine different ways to graph or chart their mammal surveys and communicate what the data says about mammal populations in their area. Some examples of ways students can graph or chart their data individually, in small groups or as a whole class are:

- Combine all of the data into a chart that displays all the different types of mammals observed and the number of sightings for each.
- Create a pie chart that shows how many different mammals were observed in a single area.
- Make a bar graph that compares the number of sightings of a specific mammal in different locations.
- Plot the number of mammals spotted vs. time-of-day or environment.
- Plot the number of sightings of the mammal vs. the behavior observed.

WRAP UP

Bring the group back together to discuss the fieldwork experience, and have students share what they learned from their data about the mammals in their area. Some prompting questions for your discussion are:

- How many different types of mammals did you see while conducting your survey?
- Did you notice a relationship between certain mammals and the types of places you would spot them?
- Was there any relationship between certain mammal sightings and the time of day?
- Were there any common mammal behaviors you observed?
- Which were the most common mammals you observed? The least common?

SOURCES

"iNaturalist.org." *iNaturalist.org*, California Academy of Sciences, *National Geographic*, 2018, www.inaturalist.org/.

Activity 2: Mammal Jeopardy

One, approximately 40-minute session; post-visit

LEARNING OBJECTIVE

Students will test their mammal knowledge in a comprehensive mammal jeopardy game!

MATERIALS

Jeopardy game board

PROCEDURE

Have students think back to the Mammal Adaptation Game. Ask students:

- Which mammals benefit from changes made by humans?
- Which mammals can change their behavior to coexist with humans?
- Which mammals are seriously threatened by these types of changes?

Create three corresponding lists of mammals on the board. At the top of the lists, write **URBAN ADAPTER**, **URBAN EXPLOITER** and **URBAN AVOIDER**. Take some time to remind students of the definitions of these terms (learned at Wave Hill). Then show some examples of each, using videos and pictures. (See the resources below.)

Divide your class into small groups of four or five students. Draw a Jeopardy table with the category headings across the top and the dollar amounts $200–$1,000 below each heading, so that you can cross off once selected. Have one group pick a category and point value, and then read aloud the corresponding question. The students will have one minute to answer each question. If the group answers incorrectly, another group will have the chance to steal. If that group also answers incorrectly, no one wins the points. Continue playing until the groups answer all the questions. The group with the most points wins!

Afterwards, reflect on the survival strategies of featured mammals. Consider which animals may need help from humans to survive. Discuss ways to educate your larger school community about these animals.

ADDITIONAL RESOURCES

Mammal Characteristics video

> "Mammals I Educational Video for Kids." *YouTube*, Happy Learning English, 12 May 2015, www.youtube.com/watch?v=hGonwMTPV6g.

Urban Avoider, Adapter, Exploiter background information

> Rose, Sarah. "Exploiters, Adapters and Avoiders: The Impact of Urbanization." *EEOB Course Blog* (*Andi Wolfe Students*), 14 Feb. 2012, http://eeobcourseblogwolfestudents.blogspot.com/2012/02/exploiters-adapters-and-avoiders-impact.html.

Graphing data

> "Data and Graphs." *Why Learn Algebra?*, Math Goodies, 2017, www.mathgoodies.com/lessons/toc_vol11.

LOCAL MAMMAL SURVEY

Date		
Location		
Description of the environment (weather, time of day, etc.)		

Name of Mammal	# of Mammals	Signs of Mammal (tracks, scat, shelter, etc)	Description of its Appearance/Behavior

Mammal Jeopardy

General Mammal Facts
$200

Name four mammals you might find at Wave Hill

Answer: Coyotes, squirrels, raccoons, opossum, feral cats, humans, skunks

General Mammal Facts
$400

What are two common characteristics of mammals?

Answer: Hair/fur, outside ears, warm blooded, feeding milk to its young

General Mammal Facts
$600

What are three signs that mammals leave behind that help us learn more about them?

Answer: Tracks, shelters, unfinished food, scat

General Mammal Facts
$800

Over time, a species of mammal may _____ to become better suited to their environment.

Answer: Adapt

General Mammal Facts
$1,000

Give an example of a mammal that is an urban avoider, and urban adapter and an urban exploter.

Answer:

Avoiders: Coyotes, bears
Adapters: Raccoons, opossums
Exploters: Rats, mice

Mammal Jeopardy

Food — $200

Mischievous raccoons can break into the most secure garbage cans when searching for food. This is an example of an urban _____.

Answer: Adapter

Food — $400

This mammal helps keep NYC's deer population in check.

Answer: Coyotes

Food — $600

These winged urban avoiders can eat up to 600 insects an hour.

Answer: Bats

Food — $800

This mammal has very long and sharp canine teeth on the sides of its mouth. What does this tell us about the type of food the mammal eats?

Answer: Carnivore (eats meat)

Food — $1,000

New York's second largest mammal hibernates for up to five months. When they wake up, these opportunistic omnivores will eat plants, berries, small animals, fish and even human food.

Answer: Black bear

Mammal Jeopardy

Shelter
$200

A mammal's home or environment is called a _____.

Answer: Habitat

Shelter
$400

Where would you expect a chipmunk to make its home?

A. A nest high up on a tree branch
B. A burrow behind a tree stump
C. A den abandoned by another mammal

Answer: B

Shelter
$600

These mammals can make two types of shelters, a nest of leaves high up on a tree branch or in a hole in a tree.

Answer: Squirrel

Shelter
$800

There are over 10,000 feral cats in NYC. These decedents of lost or abandoned house cats have learned to survive in the harsh conditions of the city. This is an example of an urban _____.

Answer: Adapter

Shelter
$1,000

These mammals birth and raise their young in discrete locations like sports arena parking lots and airport construction sites.

Answer: Coyotes

Mammal Jeopardy

Movement & Behavior — $200

This mammal relies on street trees to move around NYC.

Answer: Squirrel

Movement & Behavior — $400

Raccoons are mostly active at nighttime. This means they are _____.

Answer: Nocturnal

Movement & Behavior — $600

What is one challenge that nocturnal mammals in NYC might face?

Answer: Noise, light pollution

Movement & Behavior — $800

These small mammals are known for "playing dead" by flopping on the ground with their eyes closed when threatened by predators.

Answer: Opossum

Movement & Behavior — $1,000

Where in NYC are you most likely to spot a coyote? Why?

D. Times Square
E. Central Park
F. Van Cortlandt Park
G. City Island

Answer: C. Coyotes prefer secluded wooded areas away from high traffic areas.

Mammal Jeopardy

Mammals, Humans & Memes

$200

"Pizza Rat," the viral meme of a resourceful rat dragging a slice of pizza through a NYC subway is an example of an urban _____.

Answer: Exploiter

Mammals, Humans & Memes

$400

This animal causes 65,000 car accidents in NYC each year.

Answer: Deer

Mammals, Humans & Memes

$600

This marine mammal was once very common in NYC, but overhunting and pollution drew populations away. Today, as their numbers continue to rise, they can be seen basking in the sun on rocks and dock in NYC harbors.

Answer: Seals

Mammals, Humans & Memes

$800

In 2014, there were 3,188 reported injuries related to bites from a common NYC mammal. Who was responsible?

H. Cats
I. Coyotes
J. Dogs
K. Raccoons

Answer: B. Coyotes are often thought to be a great danger to us but it is very rare for them to approach a human, and there were only 367 reported incidents in the United States in 40 years.

Mammals, Humans & Memes

$1,000

From roaming around Wall Street to swimming in people's pools, this bold urban animal is taking over NYC. There are about 100 of these curious mammals per square mile in the city and their numbers are rising.

Answer: Raccoons