

# Ultimate Guide: Elephants: Teacher's Guide

**Grade Level:** 6-8

**Curriculum Focus:** Animals

**Lesson Duration:** Two class periods

## Program Description

Enter the elephant's world and discover provocative evidence that this intelligent beast has feelings and even a sense of humor!

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## Video Comprehension Questions

- How does an elephant's skeleton support its massive weight? (*The arrangement of the elephant's leg bones is the key to supporting the great weight of the elephant. The bones stack almost vertically to form a sturdy pillar, unlike most mammals that stand with bent bones.*)
  - Why do elephants have wrinkled skin? (*An elephant's skin is wrinkled to help it keep cool. The animal's heat is released through the skin. If the elephant has more skin it can release more heat. This extra skin causes the wrinkles.*)
  - The elephant's trunk is its most distinctive feature. What functions does it perform for the elephant? (*An elephant's trunk performs many functions. It can reach high above and below to collect food. It siphons the water. The trunk is very strong and helps drag or push obstacles. And it is used for smelling and grasping.*)
  - How do elephants communicate over great distances? (*Elephants communicate over great distances by using very low frequency sounds called infrasounds. These sounds are below the range of human hearing. Infrasounds can travel farther than sounds humans can hear because the sound waves are much longer.*)
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## Lesson Plan

### Student Objectives

- Understand that elephants have a variety of physical features that help keep them cool in hot environments.

### Materials

- *Ultimate Guide: Elephants* video and VCR, or DVD and DVD player
- Research materials on elephants

- Computer with Internet access

## *Procedures*

1. Tell the class that elephants are warm-blooded animals. Review with your students what they have learned about warm-blooded animals (birds and mammals) versus cold-blooded animals. In discussion, stress that one of the most important features of any warm-blooded animal is that its body temperature is regulated; that is, its body temperature remains fairly constant, regardless of the temperature of its surroundings.
2. Explain that in order for an animal's temperature to remain constant, the animal must have ways of keeping warm in a cold environment and cool in a hot environment. With the class, list some of the ways humans achieve a constant body temperature.
3. On a classroom map, identify the different areas that elephants live, such as grasslands of Africa and the tropical forests of India. What do these places have in common? (They are all hot.)
4. Write on the chalkboard four features or habits that help elephants keep cool in their hot habitats: large ears, wallowing, microbes in the stomach, wrinkled skin.
5. Have each student choose a habit or feature from the list and do research to find out how this habit or feature helps an elephant remain cool. Assign each student to write a short paragraph explaining what she or he has learned. Students should discover the following:
  - The blood in the many blood vessels in an elephant's ears is cooled when the elephant flaps its ears.
  - Wallowing in mud or water dampens the elephant's skin; the evaporating water takes heat from the blood in the blood vessels beneath the skin.
  - The process of digestion generates heat; microbes in an elephant's gut digest food for the elephant.
  - An animal's heat is released through the skin; the more skin an animal has, the more heat it can release.
6. Invite students to share what they have discovered. Challenge them to think of or find out about other animals in hot climates that exhibit similar adaptive features. (Example: The fennec, a small desert fox, and the jackrabbit, another desert animal, also have disproportionately large ears; whereas the Arctic fox and many other cold-climate animals have very small ears.)

## *Discussion Questions*

1. Compare the manner in which elephants walk and run to that of other mammals. How does this difference affect the elephant's speed?
2. Discuss the features elephants have to help keep them cool in the hot climates where they live.
3. Elephants live in a group with the oldest and wisest female as the primary authority. What advantages does this living arrangement provide the elephants?



4. Some scientists believe elephants have emotions similar to humans. What evidence supports this belief?

### Assessment

Use the following three-point rubric to evaluate students' work during this lesson.

- 3 points: Student's paragraph contains accurate and complete information; explanation logical and well organized; writing free of errors.
- 2 points: Student's paragraph contains accurate but incomplete information; explanation logical but lacking in organization; some errors in writing.
- 1 point: Student's paragraph contains incomplete information with some inaccuracies; explanation lacking in both logic and organization; numerous errors in writing.

### Vocabulary

#### **constrict**

*Definition:* To make narrow or draw together.

*Context:* The ears are laced with blood vessels that can dilate and constrict at will, giving the elephant very accurate control over the blood flow into her ears.

#### **dexterous**

*Definition:* Ready and skilled in physical movement.

*Context:* The trunk is as dexterous as a human hand.

#### **digestion**

*Definition:* The process of making food absorbable by dissolving it and breaking it down into simpler chemical compounds.

*Context:* Heat is also generated internally by processes like digestion.

#### **evolve**

*Definition:* To produce by natural evolutionary processes.

*Context:* A mountain of muscle, endowed with an enormous brain, the elephant has evolved over 55 million years.

#### **frequency**

*Definition:* The number of complete oscillations per second of energy (as sound or electromagnetic radiation) in the form of waves.

*Context:* All of those sounds are elephant sounds we didn't hear before. They're all below the frequencies that people can hear.

#### **infrasound**

*Definition:* Sound waves with a frequency below that of human hearing.



*Context:* Nobody had listened for infrasound among land animals before. No one had thought there was an animal large enough to make powerful low frequency sound like this.

**gait**

*Definition:* A manner of walking or moving on foot.

*Context:* Not only is this stance immensely strong, but it helps to explain the elephant's strange gait.

**matriarch**

*Definition:* A female who rules or dominates a family, group, or state.

*Context:* At such times of crisis the elephant family relies on the experience of the oldest and wisest female, the matriarch.

**microbes**

*Definition:* Microorganisms; germs.

*Context:* Instead, this largest of creatures relies on the help of some of the smallest—a teeming population of microbes in the gut digests the material for them.

**telescopic**

*Definition:* Extensible or compressible by or as if by the sliding of overlapping sections.

*Context:* The trunk is telescopic and can reach branches up to twenty feet high as well as food on the ground.

**wallow**

*Definition:* To roll oneself about in an indolent or ungainly manner.

*Context:* Wallowing may look like pure enjoyment, but it serves a vital purpose.

## *Academic Standards*

### **National Academy of Sciences**

The National Science Education Standards provide guidelines for teaching science as well as a coherent vision of what it means to be scientifically literate for students in grades K-12. To view the standards, visit <http://books.nap.edu>.

This lesson plan addresses the following science standards:

- Life Science: Structure and function in living systems

### **Mid-continent Research for Education and Learning (McREL)**

McREL's Content Knowledge: A Compendium of Standards and Benchmarks for K-12 Education addresses 14 content areas. To view the standards and benchmarks, visit <http://www.mcrel.org/compendium/browse.asp>.

This lesson plan addresses the following national standards:



- Science – Life Science: Understands relationships among organisms and their physical environment.
  - Science – Life Science: Understands the structure and function of cells and organisms
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## Support Materials

Develop custom worksheets, educational puzzles, online quizzes, and more with the free teaching tools offered on the Discoveryschool.com Web site. Create and print support materials, or save them to a Custom Classroom account for future use. To learn more, visit

- <http://school.discovery.com/teachingtools/teachingtools.html>
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