

- Discuss the difficulties we would face if there was no way to organize things.
- Ask students to explain the statement: "As organisms continually change to improve or survive, our systems of classification have to change and evolve with them."

### Follow-up Activities

- Assign each student two animals from the same scientific order to compare. Ask them to research these animals, first looking for specific physical similarities and then focusing on observable differences.
- Have students create a new classification system for identifying familiar objects. In small groups, have them look at photos or samples of the objects and divide them into two groups based on observable differences. Continue to divide the objects into smaller categories. Have students create dichotomous keys that describe the differences between each category. After each item is described within its own category, have the students exchange dichotomous keys with another group and attempt to identify the items within each category.
- Have students choose a favorite animal to research and present an illustrated report to the rest of the class. Ask students to include the seven main scientific categories that describe the animal as well as information about the English meaning of the Latin names for the animal.

### Internet Resources

- [pittsford.monroe.edu/Schools/Jefferson/Animals/AnimalsFrame.html](http://pittsford.monroe.edu/Schools/Jefferson/Animals/AnimalsFrame.html)

This site explains that the study of animal classification is called taxonomy and helps students see the relationships between animals and the whole animal family tree as it has developed through time.

- [www.hhmi.org/coolscience/critters/index.html](http://www.hhmi.org/coolscience/critters/index.html)

The Classifying Critters page of this Web site explains the scientific system that is used to keep track of plants and animals with games and puzzles.

- [www.earthfoot.org/backyard/names.html](http://www.earthfoot.org/backyard/names.html)

This Earthfoot site discusses how scientific names can tell us so much and explains why studying the classification of plants and animals is so interesting.

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- [animaldiversity.ummz.umich.edu/index.html](http://animaldiversity.ummz.umich.edu/index.html)

The Animal Diversity Web is an excellent resource for students beginning a project on animal classification, offering information about the structure and classification of animals, basic concepts of ecology and evolutionary biology, brief reports on dozens of animals, and lots of pictures and sounds.

### Suggested Print Resources

- Gotch, A. Latin. *Names Explained: A Guide to the Scientific Classification of Reptiles, Birds & Mammals*. Facts on File, Inc., New York, NY; 1996.
- Kalman, Bobbie. *What Is the Animal Kingdom?* Crabtree, New York, NY; 1998.
- Mullin, Rita. *Animalogy: Weird and Wacky Animal Facts*. Crown Publishers, New York, NY; 1998.

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## Animal Classification

Grades 5–8

Students in grade 5-8 classrooms possess a wide range of background knowledge. Student response to this video program is sure to be varied, so the teachers for these grades need all the help they can get! This guide has been designed to help science teachers in grades 5-8 by providing a brief synopsis of the program, pre-viewing and follow-up questions, activities, vocabulary and additional resources.

**Before Viewing:** Extensive research tells how important it is for the teacher to discover what the students know — or think they know — about a topic, before actually starting a new unit. Therefore, after prompting discussion with the pre-viewing questions, lead your class to create an "Everything We Think We Know About..." list. You may also wish to preview key vocabulary words, and have students raise additional questions they hope will be answered.

**After Viewing:** Have your students share video excerpts that fascinated or surprised them, then challenge your students to prove or disprove the accuracy of the facts they put on their "Everything We Think We Know About..." list. Discuss what else they learned and use the follow-up questions and activities to inspire further discussion. Encourage students to research the topic further with the Internet and reading resources provided.

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## Program Summary

Just as it is important to have a way to organize things in your home or in the supermarket, it is important for us to be able to identify, organize and name all living things on Earth. Scientists have created a special system to keep track of plants and animals. By classifying animals into groups, we can learn how animals are related. The man most responsible for our modern taxonomic system is Carolus Linnaeus, an 18th-century Swedish botanist. Knowing that creatures have been given many different names around the world, he decided to eliminate confusion by assigning each organism its own scientific name. Linnaeus introduced a binomial Latin naming system because as a language that is no longer in daily use, the meaning of Latin words do not change. Every known living thing was given a two-part Latin name, identifying that organism as being different from every other organism. The name indicates the genus and species.

This classification system starts with the most general category name, the kingdom, and ends with the most specific name, the species. The taxonomic system includes the following categories, which increase in specificity: Kingdom, Phylum, Class, Order, Family, Genus, and species. Each level of identification relates to common physiological traits and evolutionary ancestry, with some organisms sharing the same taxonomic name. Only organisms of the same species are able to produce offspring that can then reproduce. A mnemonic device for remembering the seven category names is: Kids Pick Candy Over Fancy Green Salads. Though this classification system is not perfect, scientists agree with it in principle and it is used internationally.

## Vocabulary

The following words are included for teacher reference or for use with students. They are listed in the order in which they appear in the video.

**Aristotle** — (384–322 BCE) The Greek philosopher who devised the first animal classification system.

**Carolus Linnaeus** — (1707–1778) Born Carl Linne, the Swedish botanist considered to be the father of our modern scientific classification system.

**binomial nomenclature** — The two-part scientific name that every organism is given, based on its genus and species.

**hierarchy** — A ranking system, from general to specific.

**taxonomy** — A system used for classifying and understanding the relationships between pieces of a whole.

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**taxonomist** — A scientist who studies organisms and classifies them into specific groups according to their characteristics.

**Kingdom** — One of the primary divisions into which living things are commonly classified; this category ranks above Phylum and is the highest and most encompassing group. Humans belong to Kingdom Animalia.

**Phylum** — The second most general division into which organisms are classified. Humans belong to Phylum Chordata.

**Class** — The third most general division into which organisms are scientifically classified. Humans belong to the Class Mammalia.

**Order** — The fourth most general category into which organisms are classified. Humans belong to the Order of Primates.

**Family** — The fifth most general category into which organisms are classified. Humans belong to the Family Hominidae.

**Genus** — The sixth most general category into which organisms are scientifically classified. Humans belong to the Genus Homo.

**species** — The seventh and most specific category into which organisms are scientifically classified. Humans belong to the species “sapiens.”

**Homo sapiens** — The genus and species name for human beings.

## Pre-viewing Discussion

Before students generate their list of “Everything We Think We Know About...” for this topic, stimulate and focus their thinking by raising these questions so that their list will better reflect the key ideas in this show:

1. How are all living organisms named?
2. Why are organisms grouped the way they are?

After the class has completed their “Everything We Think We Know About...” list, ask them what other questions they have that they hope will be answered during this program. Have students listen closely to learn if everything on their class list is accurate and to hear if any of their own questions are answered.

## Focus Questions

1. Why is a scientific classification system necessary?
2. How do we group animals into categories?
3. What is the current seven-step system of classifying all living organisms?
4. What is this taxonomic system based upon?
5. Is the current taxonomic system accepted completely in scientific circles?

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6. Why aren't common names useful for describing creatures?
7. How did Aristotle contribute to animal classification?
8. Who was Carolus Linnaeus?
9. How did Linnaeus change our scientific classification system?
10. Why did Linnaeus choose Latin names for organisms?
11. What is a hierarchical taxonomy?
12. What is binomial nomenclature?
13. Why are humans called Homo sapiens?
14. What is a taxonomist and what do they do?
15. What are the main categories in the present scientific classification system, in order?
16. What is an easy way to remember the main categories?
17. What are some phylum names in Kingdom Animalia?
18. What is the phylum to which humans belong?
19. What are some characteristics of all creatures belonging to Phylum Chordata?
20. Are horses and donkeys related? Explain.
21. What did we learn from the visit with the curator at the boneyard?
22. How many kingdoms do scientists believe that there are?
23. Do all scientists agree on every aspect of the present scientific classification system?

## Follow-up Discussion

Research indicates that students will retain their previous misconceptions about a topic, in preference to new information, until they actively recognize and correct their own errors. Therefore, it is important to have your students re-examine the facts/beliefs they put on their “Everything We Think We Know About...” list. It might also be helpful to review the list by marking each entry with a “+” or “-” to show which facts were correct and which were incorrect.

Discussions that ensue from thought-provoking questions provide a good way to assess the overall depth of student understanding. The following are some suggested discussion questions.

1. Discuss the many specific classification systems that are used all around us. (If needed, prompt with: personal collections, like baseball cards, CDs, stamps; organization of clothing in drawers; etc.)

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