

# Classifying Animals

## Teacher's Guide Middle School

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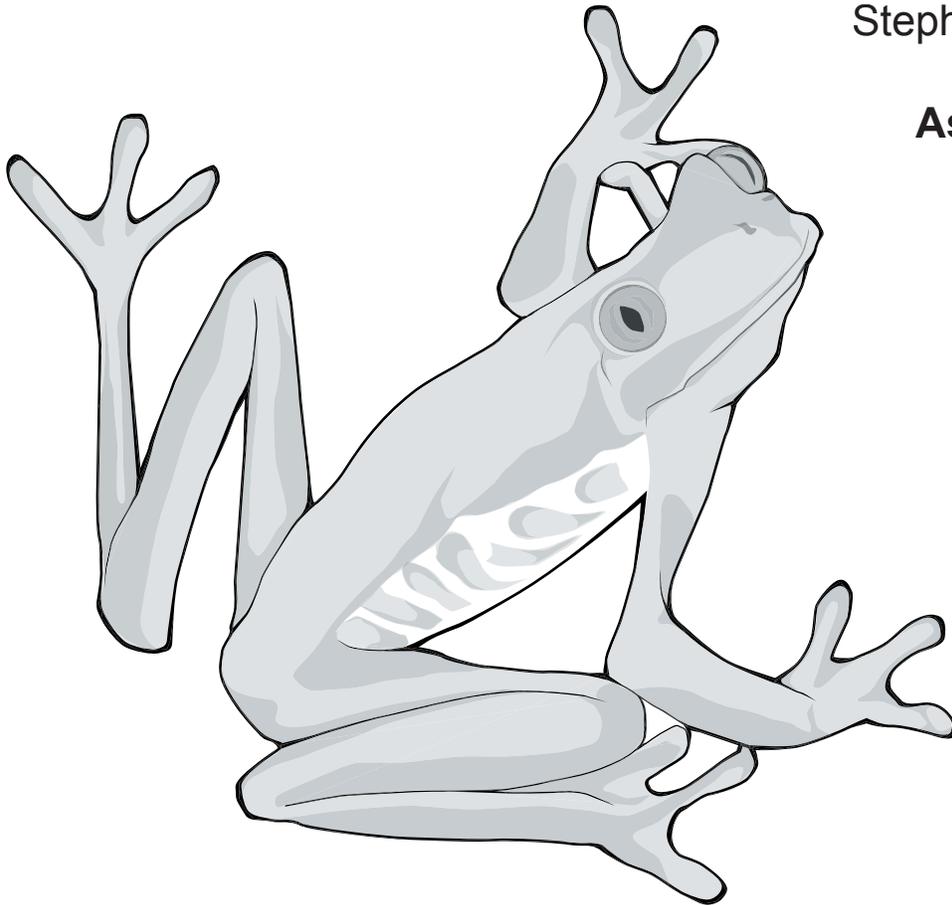
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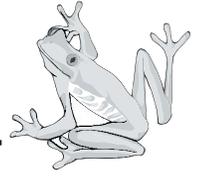


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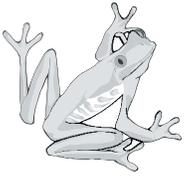
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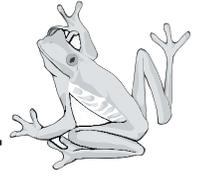
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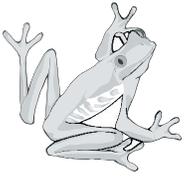
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# **A Message from our Company...**

Dear Educator:

Thank you for your interest in the educational videos produced by the Visual Learning Company. We are a Vermont-based, family owned and operated business specializing in the production of quality educational science videos and materials.

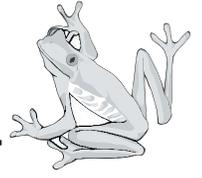
We have a long family tradition of education. Our grandmothers graduated from normal school in the 1920's to become teachers. Brian's mother was an elementary teacher and guidance counselor, and his father was a high school teacher and superintendent. This family tradition inspired Brian to become a science teacher, and to earn a Ph.D. in education, and led Stephanie to work on science educational programs at NASA.

In developing this video, accompanying teacher's guide, and student activities, our goal is to provide educators with the highest quality materials, thus enabling students to be successful. In this era of more demanding standards and assessment requirements, supplementary materials need to be curricular and standards based - this is what we do!

Our videos and accompanying materials focus on the key concepts and vocabulary required by national and state standards and goals. It is our mission to help students meet these goals and standards, while experiencing the joy and thrill of science.

Sincerely,

Brian and Stephanie Jerome



# National Standards Correlations

## National Science Education Standards

(Content Standards: 5-8, National Academy of Sciences, c. 1996)

Life Sciences (Content Standard C)

Diversity and Adaptations of Animals

As a result of their activities in grades 5-8, all students should develop an understanding that:

- Millions of species of animals, plants, and microorganisms are alive today. Although different species might look dissimilar, the unity among organisms becomes apparent from an analysis of internal structures, the similarity of their chemical processes, and the evidence of common ancestry.

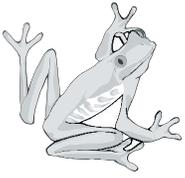
## Benchmarks for Science Literacy

(Project 2061 – AAAS, c. 1993)

The Living Environment - Diversity of Life (5A)

By the end of the 8th grade, students should know that:

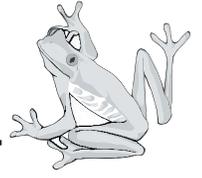
- One of the most general distinctions among organisms is between plants, which use sunlight to make their own food, and animals, which consume energy-rich foods.
- Animals and plants have a great variety of body plans and internal structures that contribute to their being able to make or find food and reproduce.
- Similarities among organisms are found in internal anatomical features, which can be used to infer the degree of relatedness among organisms. In classifying organisms, biologists consider details of internal and external structures to be more important than behavior or general appearance.



# Student Learning Objectives

Upon viewing the video and completing the enclosed student activities, students will be able to do the following:

- Define an animal as a living thing made up of many cells, which must eat other things for its energy.
- Differentiate between an invertebrate animal and a vertebrate animal.
- Explain that taxonomists use many different characteristics to classify animals including genetic make-up, evolutionary relationships, physical characteristics, and behavior to name just a few.
- Cite an example of an animal in the phylum porifera.
- Generally explain some of the characteristics of poriferans including their body plan and the presence of tiny holes called pores.
- Cite an example of an animal in the phylum cnidaria.
- Generally discuss some of the major features of cnidarians including the presence of tentacles, a nerve net, and other specialized tissues.
- Differentiate between flatworms, roundworms, and segmented worms, and provide an example of each.
- Describe some of the different forms members of the phylum mollusca may take.
- List some examples of mollusks including clams, oysters, octopuses, and squid.
- Cite some of the numerous and varied examples of arthropods.
- Describe some of the general characteristics of arthropods including the presence of an exoskeleton, jointed appendages, and segmented bodies.
- Provide examples of some echinoderms such as starfish, sea urchins, sand dollars, and sea cucumbers.
- Explain some of the general characteristics of echinoderms including the presence of radial symmetry and a water vascular system.
- List and generally describe the major groups of vertebrate animals including fish, amphibians, reptiles, birds, and mammals.



# Assessment

## **Preliminary Assessment:**

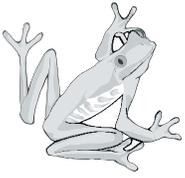
The Preliminary Assessment, provided in the Student Masters section, is an assessment tool designed to gain an understanding of students' pre-existing knowledge. It can also be used as a benchmark upon which to assess student progress based on the objectives stated on the previous pages.

## **Video Review:**

The Video Review, provided in the Student Masters section, can be used as an assessment tool or as a student activity. There are two main parts. The first part contains questions that can be answered during the video. The second series of ten questions consists of a video quiz to be answered at the conclusion of the video.

## **Post Assessment:**

The Post Assessment, provided in the Student Masters section, can be utilized as an assessment tool following completion of the video and student activities. The results of the Post Assessment can be compared against the results of the Preliminary Assessment to evaluate student progress.



## **Introducing the Video**

Before showing the video program, ask students to compare and contrast the following animals: sea anemone, earthworm, and a grizzly bear. Make a list of the characteristics of each of these organisms on the board under the name of each organism.

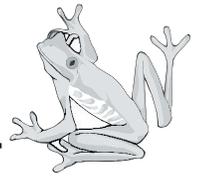
Discuss with your students some of the various characteristics scientists consider when classifying animals. Discuss attributes such as physical appearance, movement, reproduction, behavior, and symmetry. Also, introduce students to the terms invertebrate and vertebrate. Take a class vote on whether students think the three different animals you have discussed are invertebrates or vertebrates. Tell students to pay close attention to the video to learn more about the process of classifying animals.

## **Video Viewing Suggestions**

The student Master “Video Review” is provided for distribution to students. You may choose to have your students complete this Master while viewing the program or to do so upon its conclusion.

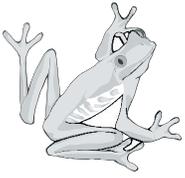
The program is approximately twenty minutes in length and includes a ten question video quiz. Answers are not provided to the Video Quiz on the video, but are included in this teacher’s guide. You may choose to grade student quizzes as an assessment tool or to review the answers in class.

The video is content-rich with numerous vocabulary words. For this reason you may want to periodically stop the video to review and discuss new terminology and concepts.



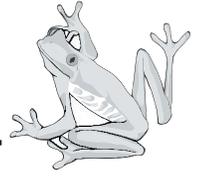
# Video Script: Classifying Animals

1. Maybe you have a pet such as a dog. . .
2. . . . or cat. . .
3. . . . tropical fish. . .
4. . . . or maybe you even have a parrot for a pet.
5. These are all examples of different kinds of animals.
6. If you have ever taken a walk in a nearby park, chances are you have heard birds singing, . . .
7. . . . seen a squirrel scampering on the grass, . . .
8. . . . been pestered by insects, . . .
9. . . . or if you are lucky enough, you have been able to see deer grazing, . . .
10. . . . or a snake slithering through the grass.
11. All of these different kinds of animals make their home in nature.
12. During the next few minutes, we are going to take a look at the wide range of animals which inhabit the planet, . . .
13. . . . and we are going to take a look at the process of classifying them.
- 14. Graphic Transition – What Are Animals?**
15. We all recognize living things such as cows, . . .
16. . . . birds, and sea lions as animals.
17. But, what about this sea anemone, and this marine algae?
- 18. You Compare!** What makes a sea anemone different from marine algae?
19. Both live in the ocean, and look somewhat similar.
20. But, actually they are quite different from each other.
21. Marine algae obtains its energy from the sun via the process of photosynthesis.
22. The sea anemone, on the other hand, is an animal, not a plant, and it cannot make its own food.
23. What exactly is an animal? An animal is a living thing made up of many cells, which must eat other things for its energy.
24. Most animals also have a muscular system and a nervous system, which enable them to move.
- 25. Graphic Transition – Classifying Animals**
26. The animal kingdom is the largest of the kingdoms.
27. There are over a million different kinds, or species, of known animals on Earth. . .
28. . . . and scientists are still discovering new species of animals.
29. There are about 30 different phyla of animals inside the animal kingdom.
30. The nine largest phyla contain most of the species, and we will spend our time discussing these phyla.
31. Scientists often group animals into two general categories – invertebrates and vertebrates.



## **Script Cont.**

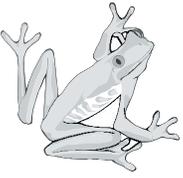
32. Invertebrate animals such as worms, mollusks, and insects do not have a backbone.
33. Vertebrate animals such as birds and reptiles do have a backbone.
34. Animals come in a wide variety of shapes, sizes, body forms, and behavior patterns.
35. Taxonomists use many of these different characteristics to classify animals, including genetic make-up, evolutionary relationships, physical characteristics, and behavior to name just a few.
36. Let us now take a look at some of the different phyla of animals, beginning with invertebrates and progressing to vertebrate animals.
- 37. Graphic Transition – Sponges and Cnidarians**
38. The first multicellular life developed over 500 million years ago.
39. Modern day sponges are thought to be related to some of these early life forms.
40. The synthetic sponges that you use to wipe the kitchen counter, . . .
41. . . . have replaced natural sponges such as these.
42. This natural sponge is actually the dead remains of a simple invertebrate animal that lives in the ocean.
43. Sponges belong in the phylum Porifera.
44. The word porifera means pore-bearing. Sponges filter water through many small openings called pores, and capture food particles as they pass through the body.
45. The next phylum, Cnidaria, contains animals which are more advanced.
46. The phylum Cnidaria contains many fascinating animals such as colorful corals,. . .
47. . . . sea anemones with their paralyzing ability to capture prey,. . .
48. . . .monster-like hydra, and, . . .
49. . . .beautiful and graceful jellyfish.
50. Cnidarians possess greater complexity than the Poriferans, possessing moving tentacles, a nerve net, and other specialized tissues.
51. Cnidarians have a hollow body cavity, which is often surrounded by tentacles.
52. The tips of the tentacles in many cases contain specialized stinging cells called nematocysts, which are used to paralyze prey.
53. In some animals, such as jellyfish, these stinging cells can be very painful when they come in contact with a person's skin.
- 54. Graphic Transition – Flatworms, Roundworms, and Segmented Worms**
55. You may think that if you have seen one worm, you have seen them all.
56. But this is not the case. In fact, there are hundreds of thousands of different kinds of worms in three different phyla.
57. The three different phyla of worms include flatworms, roundworms, and segmented worms.



## **Script Cont.**

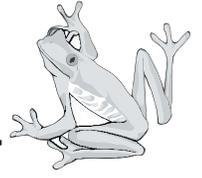
58. Chances are you have not seen a flatworm, because most are quite small.
59. To get a good look at this flatworm called a planarian, you need a microscope.
60. Planarians live in water and are often found in streams and ponds near your home.
- 61. You Observe!**

If we draw a line down the long axis of a worm's body, how do the two halves look compared to each other?
62. Notice that the two halves are mirror images of each other. This is called bilateral symmetry.
63. Flatworms not only include planarians but also worms called flukes, and tapeworms which can live as parasites inside the human body.
64. Roundworms, another phylum of worms, have a head and a tail.
65. They have a tube-like digestive system in which food travels one way.
66. There may be over a half million different species of roundworms on earth.
67. You are probably most familiar with worms in the phylum Annelida.
68. These worms are commonly called segmented worms. Notice that this common earthworm is divided into numerous segments.
69. Segmented worms such as earthworms live on land, while thousands of other species dwell in marine environments, and some like leeches live in freshwater.
- 70. Graphic Transition – Mollusks**
71. Perhaps you have eaten steamed clams.
72. Or maybe you have eaten another related animal, squid, in the form of calamari.
73. These invertebrate animals are members of the phylum Mollusca of which there are about 110,000 identified species.
74. Examples of mollusks include mussels, clams, oysters, scallops, and squid.
75. Mollusks are soft bodied animals that usually have inner or outer shells.
76. Some mollusks such as clams and mussels have two shells which are hinged, and can open and shut.
77. Others, such as snails have a single external shell.
78. Still, other mollusks, such as slugs do not possess shells at all.
79. Highly developed mollusks called cephalopods,...
80. ...possess a head with eyes, and tentacles which are used to capture prey.
- 81. Graphic Transition- Arthropods**
- 82. You Decide!** How are a horseshoe crab, a bee, and a spider similar?
83. They are all arthropods.
84. Scientists have identified over one million species of arthropods.
85. Amazingly, taxonomists believe there may be as many as one billion different species of arthropods on the planet, with hundreds of millions yet to be discovered.
86. Members of the phylum arthropoda are extremely valuable producers of food, such as honey made by bees.



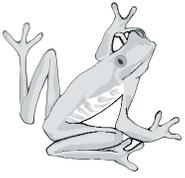
## **Script Cont.**

87. And, arthropods perform many extremely important ecological jobs.
88. What exactly makes an arthropod an arthropod?
89. First, arthropods have an exoskeleton. This means that they possess a hard skeleton on the outside of their body as does this lobster.
90. Second, arthropods have jointed appendages.
91. Appendages such as claws, legs, wings, and antennae are jointed.
92. Third, arthropods have segmented bodies which can be clearly seen in many insects which have multiple segments.
93. Taxonomists divide the phylum Arthropoda into different classes based largely on body form.
94. The class Crustacea includes animals such as crabs, lobsters,...
95. ...barnacles...
96. ...and shrimp, most of which live in water.
97. Another class, Arachnids, consist not only of spiders...
98. ...but also include ticks, mites, and scorpions.
99. The class insecta is the largest class of arthropods.
100. In fact, there are more species of insects than all the other types of animals combined.
101. Characterized by a body with three segments, and three pairs of legs, insects are found just about everywhere on the planet's surface.
- 102. Graphic Transition- Echinoderms**
- 103. You Observe!** Describe the appearance of the skin on this starfish.
104. That is right it looks bumpy or spiny.
105. In fact, the phylum to which starfish belong, Echinodermata, is derived from the Greek words meaning spiny skin.
106. Examples of echinoderms include starfish, sea urchins, sea cucumbers, and sand dollars to name a few.
107. Echinoderms are different from arthropods in that most have an internal skeleton; and possess radial symmetry, which means they have a symmetry in a circular pattern around a central point.
108. They also have a water vascular system consisting of numerous tubes which conduct food, water, and gases throughout the body.
109. Many echinoderms possess tube-like feet which are connected to the water vascular system and enable the organism to walk and obtain food.
110. There are about 6,000 living species of echinoderms, with most living in ocean environments.
- 111. Graphic Transition - Vertebrates**
112. The final phylum we will discuss is the phylum chordata.
113. Vertebrates are one class of chordates. We are vertebrates.



## Script Cont.

114. Vertebrates are animals that have a vertebral column, commonly called a backbone.
115. Within the backbone is the spinal cord which connects the brain to nerves throughout the body.
116. Vertebrates are often described as being either cold blooded or warm blooded.
117. Cold blooded means that their body temperature is largely dependent on the temperature of the environment.
118. Warm blooded animals, however, have the ability to maintain a relatively constant body temperature.
119. Let us quickly review the five major vertebrate classes.
120. Fish, as you know, are water dwelling vertebrates which possess scales, fins, and gills.
121. They may be categorized as jaw less fish, cartilaginous fish, or as bony fish.
122. Amphibians include frogs, toads, salamanders, and newts. They breathe through gills in early life stages,...
123. ...but develop lungs later in life.
124. Amphibians also lay their eggs in water.
125. Another class of vertebrates, reptiles, commonly lay their eggs on dry land.
126. Reptiles lay a special type of egg and they have lungs and scaly skin.
127. Examples of reptiles include lizards, snakes, turtles, alligators, and crocodiles.
128. A group of warm blooded vertebrates with which you are well familiar are birds.
129. Birds have feathers and possess the remarkable ability to fly. Birds too lay eggs.
130. Due to the fact that birds are warm blooded they can be found in all corners of the earth.
131. The final group of vertebrates we will discuss are mammals.
- 132. You Compare!** What makes a mammal different from a bird?
133. Mammals have hair or fur, whereas birds possess feathers.
134. Mammals feed their young with milk produced by mammary gland, birds do not.
135. Cows, dogs, coyotes, and humans are all examples of mammals.
136. Mammals are considered to be the most advanced form of animals due to their highly developed brain and accompanying nervous system.
- 137. Graphic Transition- Summing Up**
138. During the past few minutes we have explored the fascinating characteristics of the animal kingdom,...
139. ...and some of the ways animals are classified.
140. We began by seeing that animals are multicellular creatures that eat other things for energy.
141. We discussed that animals are often divided into two major categories, invertebrates and vertebrates.



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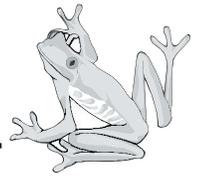
142. We took a closer look at the major animal phyla beginning with the simplest organisms poriferans, commonly called sponges.
143. The major characteristics of the phylum cnidaria were also explained.
144. We studied the different phyla of worms including flatworms, round worms, and segmented worms.
145. Various types of mollusks were studied including clams, mussels, snails, oysters, and squid.
146. The defining characteristics of arthropods were explored, while taking a look at some of the major categories of arthropods such as crustaceans, arachnids, and insects.
147. The smaller phylum of echinoderms was explored by looking at some of its members.
148. The last category of animals discussed were the chordates, more specifically the vertebrates.
149. We briefly mentioned the major vertebrate classes including fish, amphibians, reptiles, birds, and mammals.
150. So, the next time you admire an animal while taking a walk,...
151. ...enjoy eating clams,
152. ...or play with your pet,..
153. ...think about some of the things we discussed during the past few minutes, you just might think about the animal kingdom a little differently.

### **154. Graphic Transitions- Video Quiz**

Fill in the correct word to complete the sentence, good luck and let us get started.

1. \_\_\_\_\_ cannot make their own food.
2. \_\_\_\_\_ animals do not possess a backbone.
3. Taxonomists use many different \_\_\_\_\_ to classify animals.
4. Sponges are members of the phylum \_\_\_\_\_.
5. This earthworm is one example of a \_\_\_\_\_ worm.
6. Clams and snails are in the phylum \_\_\_\_\_.
7. The skin of many echinoderms is \_\_\_\_\_.
8. The bodies of arthropods are surrounded by an \_\_\_\_\_.
9. There are more species of \_\_\_\_\_ than any other type of animal.
10. Birds and mammals are warm \_\_\_\_\_.

Answers can be found on page 17



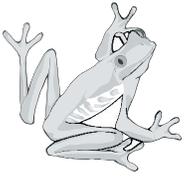
# Student Assessments and Activities

## Assessment Masters:

- Preliminary Assessment
- Video Review
- Post Assessment

## Student Activity Masters:

- Classification of Animals
- Vertebrate Classification
- Vocabulary of *Classifying Animals*



# Answers to Student Assessments

## Preliminary Assessment (pgs. 20-21)

1. eat
2. invertebrate
3. classify
4. cnidaria
5. bilateral
6. mollusca
7. exoskeleton
8. insecta
9. spiny
10. cold
11. true
12. false
13. true
14. false
15. true
16. true
17. false
18. true
19. false
20. true

## Video Review (pg. 22)

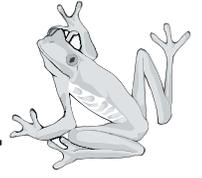
1. Marine algae obtains its energy from the sun using the process of photosynthesis. The sea anemone is an animal and must eat other things for its energy.
2. The two halves are mirror images of each other. This is called bilateral symmetry.
3. The horseshoe crab, bee and spider are all arthropods.
4. The skin on the starfish looks bumpy or spiny.
5. Mammals have hair or fur and feed their young with milk produce by mammary glands. Birds have feathers and do not feed their young with milk.

## Video Quiz (p. 22)

1. animals
2. invertebrate
3. characteristics
4. porifera
5. segmented
6. mollusca
7. spiny
8. exoskeleton
9. insects
10. blooded

## Post Assessment (pgs. 23-24)

1. exoskeleton
2. cnidaria
3. mollusca
4. spiny
5. invertebrate
6. eat
7. cold
8. classify
9. bilateral
10. insecta
11. false
12. true
13. true
14. true
15. true
16. false
17. false
18. true
19. true
20. false



# Answers to Student Activities

## Classification of Animals (pgs. 25 - 27)

1. Porifera; sponges; invertebrate; none or radial symmetry; hollow-bodied with many pores, filter feeders, sessile.
2. Cnidaria; sea anemone, corals, jellyfish; invertebrate; radial symmetry; hollowed body often surrounded by tentacles, polyps and medusae life forms.
3. Platyhelminthes (flatworms); planaria; invertebrate; bilateral symmetry; head, eye spots.
4. Nematoda; roundworms; invertebrate; bilateral symmetry; tube-like digestive tract.
5. Annelida; segmented worms, earthworms; invertebrate; bilateral symmetry; body has numerous segments, closed circulatory system.
6. Arthropoda; insects, crustaceans, arachnids; invertebrates, bilateral symmetry; hard exoskeleton, complex nervous system, jointed appendages, segmented body.
7. Echinodermata; starfish, sea urchin, sand dollar; invertebrate; radial symmetry; spiny skin, water vascular system, internal skeleton.
8. Chordata (subphylum vertebrata); birds, fish, mammals, reptiles, amphibians; vertebrate; bilateral symmetry; highly developed nervous system, closed circulatory system; appendages such as fins, wings, or legs.

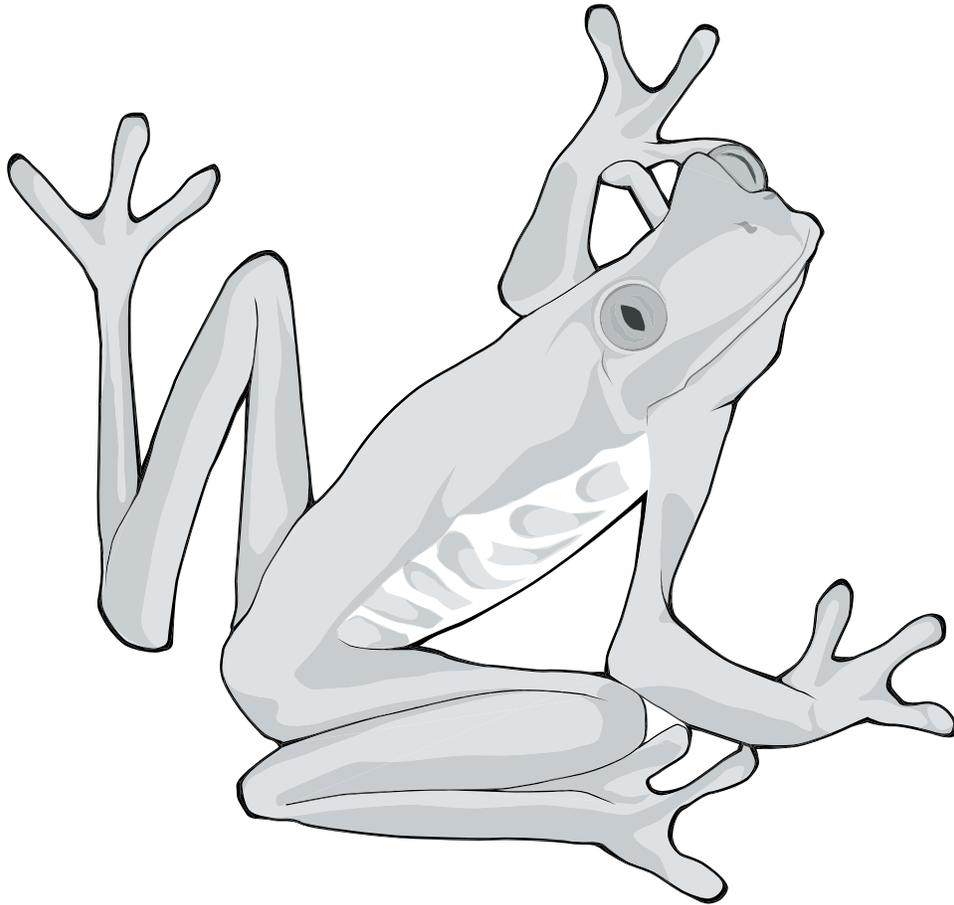
## Vertebrate Classification (pgs. 28 - 29)

1. a. bony fish (osteichythes) b. salmon, sunfish c. cold-blooded d. fresh or salt water e. gills, fins.
2. a. amphibian b. frogs, toads, salamanders c. cold-blooded d. moist places e. moist skin, webbed feet on some, lay eggs in water, and live early life in water.
3. a. reptile b. snakes, lizards, turtles, alligators c. cold-blooded d. hot deserts, wetlands, temperate environments.
4. a. birds b. chickens, hawks, flamingos c. warm-blooded d. nearly all environments e. possess feathers, light skeleton, lay eggs.
5. a. mammals b. deer, bears, dogs c. warm-blooded d. nearly all environments e. possess fur, bare live young which are fed via mammary glands.

## Vocabulary of *Classifying Animals* (p. 30)

1. e - invertebrate
2. h - bilateral symmetry
3. a - vertebrate
4. j - flatworms
5. b - mollusks
6. g - poriferans
7. c - arthropod
8. f - reptiles
9. d - mammals
10. i - echinoderms

# **Assessment and Student Activity Masters**



# Preliminary Assessment

**Directions:** Fill in the blank with the correct word. A list of possible answers is provided at the bottom of the page.

1. Animals must \_\_\_\_\_ other living things to obtain energy.
2. \_\_\_\_\_ animals do not possess a backbone.
3. Taxonomists use many different characteristics to \_\_\_\_\_ animals.
4. Jellyfish, corals, and sea anemones are members of the phylum \_\_\_\_\_.
5. Flatworms such as planarians have bodies which exhibit \_\_\_\_\_ symmetry.
6. Clams, oysters, and squid are all members of the phylum \_\_\_\_\_.
7. Arthropods have a hard external skeleton called an \_\_\_\_\_.
8. The class \_\_\_\_\_ is the largest class of arthropods.
9. Echinoderms such as starfish tend to have \_\_\_\_\_ skin.
10. Fish and reptiles are examples of \_\_\_\_\_ blooded vertebrates.

bilateral

eat

cold

exoskeleton

classify

cnidaria

spiny

invertebrate

insecta

mollusca

# Preliminary Assessment

**Directions:** Decide whether the statement is true (T) or false (F).

- |  |   |   |
|--|---|---|
| 11. The animal kingdom is the largest of the kingdoms.                                     | T | F |
| 12. Vertebrate animals such as birds and reptiles do not have backbones.                   | T | F |
| 13. Cnidarians tend to have a hollow body cavity surrounded by tentacles.                  | T | F |
| 14. Worms are relatively rare on earth with less than a thousand species.                  | T | F |
| 15. Earthworms have segmented bodies and are members of the phylum annelida.               | T | F |
| 16. Mollusks are soft-bodied animals that have inner or outer shells.                      | T | F |
| 17. Bees, lobsters, and spiders are members of the phylum nematoda.                        | T | F |
| 18. Echinoderms tend to have an internal skeleton, whereas arthropods have an exoskeleton. | T | F |
| 19. Birds and mammals are cold-blooded vertebrates.  | T | F |
| 20. Mammals have fur and feed their young with milk produced by mammary glands.            | T | F |

# Video Review

**Directions:** During the course of the program, answer the questions as they are presented in the video. At the end of the video, answer the Video Quiz questions.

**You Compare!**

1. What makes a sea anemone different from marine algae?

**You Observe!**

2. If we draw a line down the long axis of a worm's body, how do the two halves look compared to each other?

**You Decide!**

3. How are a horseshoe crab, a bee, and a spider similar?

**You Observe!**

4. Describe the appearance of the skin on this starfish.

**You Compare!**

5. What makes a mammal different from a bird?

**Video Quiz:**

1. \_\_\_\_\_ cannot make their own food.
2. \_\_\_\_\_ animals do not possess a backbone.
3. Taxonomists use many different \_\_\_\_\_ to classify animals.
4. Sponges are members of the phylum \_\_\_\_\_.
5. This earthworm is one example of a \_\_\_\_\_ worm.
6. Clams and snails are in the phylum \_\_\_\_\_.
7. The skin of many echinoderms is \_\_\_\_\_.
8. The bodies of arthropods are surrounded by an \_\_\_\_\_.
9. There are more species of \_\_\_\_\_ than any other type of animal.
10. Birds and mammals are warm \_\_\_\_\_.

# Post Assessment

**Directions:** Fill in the blank with the correct word. A list of possible answers is provided at the bottom of the page.

1. Arthropods have a hard external skeleton called an \_\_\_\_\_.
2. Jellyfish, corals, and sea anemones are members of the phylum \_\_\_\_\_.
3. Clams, oysters, and squid are all members of the phylum \_\_\_\_\_.
4. Echinoderms such as starfish tend to have \_\_\_\_\_ skin.
5. \_\_\_\_\_ animals do not possess a backbone.
6. Animals must \_\_\_\_\_ other living things to obtain energy.
7. Fish and reptiles are examples of \_\_\_\_\_ blooded vertebrates.
8. Taxonomists use many different characteristics to \_\_\_\_\_ animals.
9. Flatworms such as planarians have bodies which exhibit \_\_\_\_\_ symmetry.
10. The class \_\_\_\_\_ is the largest class of arthropods.

invertebrate  
spiny  
cnidaria  
exoskeleton  
mollusca

eat  
cold  
classify  
insecta  
bilateral

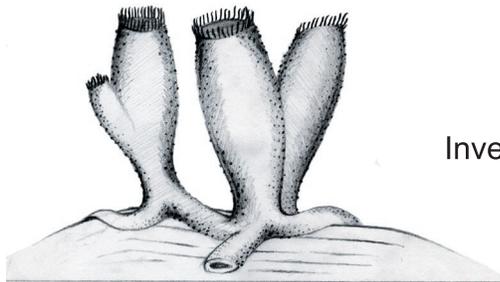
# Post Assessment

**Directions:** Decide whether the statement is true (T) or false (F).

- |  |   |   |
|--|---|---|
| 11. Bees, lobsters, and spiders are members of the phylum nematoda.                        | T | F |
| 12. Mammals have fur and feed their young with milk produced by mammary glands.            | T | F |
| 13. Mollusks are soft-bodied animals that have inner or outer shells.                      | T | F |
| 14. Echinoderms tend to have an internal skeleton, whereas arthropods have an exoskeleton. | T | F |
| 15. Earthworms have segmented bodies and are members of the phylum annelida.               | T | F |
| 16. Birds and mammals are cold-blooded vertebrates.  | T | F |
| 17. Vertebrate animals such as birds and reptiles do not have backbones.                   | T | F |
| 18. The animal kingdom is the largest of the kingdoms.                                     | T | F |
| 19. Cnidarians tend to have a hollow body cavity surrounded by tentacles.                  | T | F |
| 20. Worms are relatively rare on earth with less than a thousand species.                  | T | F |

# Classification of Animals

**Directions:** The animal kingdom is the largest of the kingdoms. There are over a million different kinds of species of known animals on Earth, and scientists are still discovering new animals. There are about 30 different phyla of animals in the animal kingdom. The nine largest phyla contain most of the species. On the following two pages is an image of a representative animal of each of these nine phyla. Using your knowledge of the animal kingdom, and other resources, complete the description of each phylum.

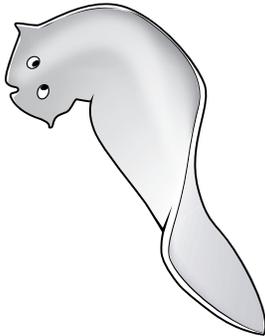


Phylum: \_\_\_\_\_  
Example: \_\_\_\_\_  
Invertebrate / Vertebrate: \_\_\_\_\_  
Symmetry: \_\_\_\_\_  
Physical features: \_\_\_\_\_  
\_\_\_\_\_



Phylum: \_\_\_\_\_  
Example: \_\_\_\_\_  
Invertebrate / Vertebrate: \_\_\_\_\_  
Symmetry: \_\_\_\_\_  
Physical features: \_\_\_\_\_  
\_\_\_\_\_

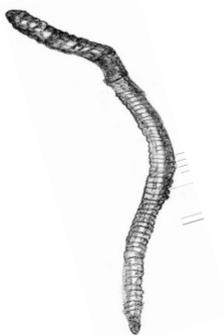
# Classification of Animals cont.



Phylum: \_\_\_\_\_  
Example: \_\_\_\_\_  
Invertebrate / Vertebrate: \_\_\_\_\_  
Symmetry: \_\_\_\_\_  
Physical features: \_\_\_\_\_  
\_\_\_\_\_



Phylum: \_\_\_\_\_  
Example: \_\_\_\_\_  
Invertebrate / Vertebrate: \_\_\_\_\_  
Symmetry: \_\_\_\_\_  
Physical features: \_\_\_\_\_  
\_\_\_\_\_

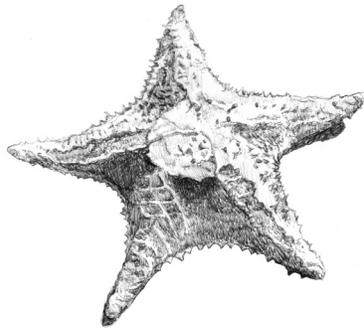


Phylum: \_\_\_\_\_  
Example: \_\_\_\_\_  
Invertebrate / Vertebrate: \_\_\_\_\_  
Symmetry: \_\_\_\_\_  
Physical features: \_\_\_\_\_  
\_\_\_\_\_

# Classification of Animals cont.



Phylum: \_\_\_\_\_  
Example: \_\_\_\_\_  
Invertebrate / Vertebrate: \_\_\_\_\_  
Symmetry: \_\_\_\_\_  
Physical features: \_\_\_\_\_  
\_\_\_\_\_



Phylum: \_\_\_\_\_  
Example: \_\_\_\_\_  
Invertebrate / Vertebrate: \_\_\_\_\_  
Symmetry: \_\_\_\_\_  
Physical features: \_\_\_\_\_  
\_\_\_\_\_



Phylum: \_\_\_\_\_  
Example: \_\_\_\_\_  
Invertebrate / Vertebrate: \_\_\_\_\_  
Symmetry: \_\_\_\_\_  
Physical features: \_\_\_\_\_  
\_\_\_\_\_

# Vertebrate Classification

**Background:** The phylum chordata contains some animals with which you are most familiar including cats, dogs, horses, and people. The phylum is divided into three subphyla. You may not be familiar with two of the subphyla. The subphylum, Urochordata, are also called lancelets. The members of these two subphyla live in marine environments and do not have backbones. The third phylum you are quite familiar with - the vertebrates. Vertebrate animals possess a spinal column made up of vertebrae. In addition to a backbone, vertebrates have numerous other characteristics including a jointed internal skeleton and two pairs of jointed appendages.

**Directions:** There are several different classes of vertebrates. You are probably familiar with examples of each of the classes. In this activity we will consider five classes of vertebrates, keeping in mind that there are others we will not work with. Using your knowledge of vertebrates, and other resources, answer the questions beside the picture.

1.



- What class does this vertebrate belong to?
- List some examples
- Is this animal cold or warm-blooded?
- What type of environment does this vertebrate live in?
- What are the physical features of this vertebrate?

2.

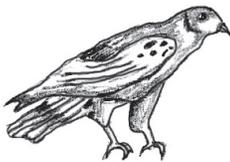


- What class does this vertebrate belong to?
- List some examples
- Is this animal cold or warm-blooded?
- What type of environment does this vertebrate live in?
- What are the physical features of this vertebrate?

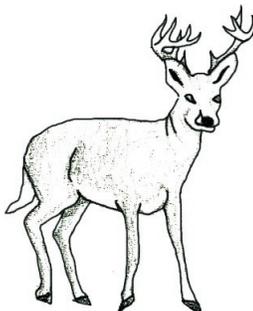
# Vertebrate Classification, cont.



- a. What class does this vertebrate belong to?
- b. List some examples
- c. Is this animal cold or warm-blooded?
- d. What type of environment does this vertebrate live in?
- e. What are the physical features of this vertebrate?



- a. What class does this vertebrate belong to?
- b. List some examples
- c. Is this animal cold or warm-blooded?
- d. What type of environment does this vertebrate live in?
- e. What are the physical features of this vertebrate?



- a. What class does this vertebrate belong to?
- b. List some examples
- c. Is this animal cold or warm-blooded?
- d. What type of environment does this vertebrate live in?
- e. What are the physical features of this vertebrate?

# Vocabulary of Classifying Animals

**Directions:** Unscramble the vocabulary words in the first column. Match the words to the definitions in the second column.

- |   |  |
|---|--|
| <p>_____ 1. vtteerraeibn _____</p>                | <p>a. an animal which possesses a backbone; examples include fish, reptiles, and mammals.</p>    |
| <p>_____ 2. aaierlbt yyrstemm _____<br/>_____</p> | <p>b. phylum of invertebrate animals which include clams, oysters, octopuses, and squids.</p>    |
| <p>_____ 3. rbtervaeet _____</p>                  | <p>c. the largest phylum of animals and includes insects, arachnids, and crustaceans.</p>        |
| <p>_____ 4. sfmlraotw _____</p>                   | <p>d. group of warm-blooded vertebrates which possess fur and are the most advanced animals.</p> |
| <p>_____ 5. ssmlkku _____</p>                     | <p>e. an animal which does not possess a backbone.</p>   |
| <p>_____ 6. aeiopfr _____</p>                     | <p>f. group of cold-blooded vertebrates including snakes, lizards and alligators.</p>            |
| <p>_____ 7. rroohdtpa _____</p>                   | <p>g. a phylum of simple invertebrate animals which consist of sponges.</p>                      |
| <p>_____ 8. tsrieelp _____</p>                    | <p>h. a body plan in which the two halves are mirror images of each other.</p>                   |
| <p>_____ 9. asmlmam _____</p>                     | <p>i. phylum of invertebrates including sea urchins, starfish, and sand dollars.</p>             |
| <p>_____ 10. meoicserhdn _____<br/>_____</p>      | <p>j. examples of worms in this phylum include planarians, flukes, and tapeworms.</p>            |