

Diversity of Life: Animal Kingdom

Lessons 4 & 5 Vertebrates

7th Grade Science
Class Notes & Activities

Lesson 4: Vertebrates - Read pages 155-157 to complete this section.

(A) What phylum includes vertebrates, or animals with a backbone?

CHORDATES

(B) At some point in their lives, all of these have:

- 1 - A **NOTOCHORD**, which is a flexible rod that supports its back.
- 2 - A nerve cord, such as our **SPINAL** cord, to connect the brain to nerves in the rest of the body
- 3 - Have **THROAT** pouches, which become gills in some animals or disappear before birth



(C) Most chordates have a backbone, or **SPINE**, and is made up of many small bones called **VERTEBRAE**.

(D) An **ECOTHERM**'s body temperature changes with temperature changes in its environment, while an **ENDOTHERM** is able to produce and regulate its own temperature.

COLD-BLOODED
(ADD TO NOTES)

WARM-BLOODED
(ADD TO NOTES)

Lesson 5: Vertebrate Diversity - Read pages 158-163 to complete this section.

(A) Fish are vertebrates that live in **WATER** and use **FINS** to move with most being cold-blooded (or **ECOTHERM**). Most of them have **SCALES** and obtain **OXYGEN** through gills. They have a ★ **3**-chambered heart.

(B) Fish are classified into three groups: **JAWLESS** fishes, **CARTILAGINOUS** fishes, and **BONY** fishes.

*Do you know ...
What is our state fish?
Blue Gill*



*Glue the
Vertebrate Chart
on page 13 (4 corners)
under your note page*

*As we watch the videos for
this unit, fill in the first
column with examples and
add information you think
is interesting or important
to the second column.*

Class & Examples	Interesting Information
Fish	
Amphibians	
Reptiles	
Birds	
Mammals	

Examples of Fishes

Fish that have no jaws and no scales are called **JAWLESS** fish. Their skeletons are made of **CARTILAGE**, which is a tissue that is more flexible than bone.

Jawless Fish

Lamprey



Hagfish



Hagfish

Bony Fish

Bass



Trout



Flounder

A **BONY** fish has jaws, scales, a pocket that holds the gills, and a skeleton made of hard bone. They also have a **SWIM BLADDER**, which is an internal gas-filled sac that helps them stabilize at different depths in the water.

Cartilaginous Fish

Shark



Sting Ray



Fish with jaws, scales, and skeletons made of cartilage are called **CARTILAGINOUS** fish. They are usually carnivores that eat other animals for food.



Stingray

What did you add to your chart?

Class & Examples	Interesting Information
Fish	
Amphibians	

(C) An **AMPHIBIAN** is an ectothermic vertebrate that spends its early life in water and adult life on land. They lay eggs in **WATER** and have hearts with ★ **3** chambers. While **SALAMANDERS** have tails, most adult **FROGS** and **TOADS** do not.



Do you know ... What is our state reptile?

Eastern Tiger Salamander



**Jeff Corwin
Amphibians**

What did you add to your chart?

Amphibians	

(D) A **REPTILE** is an ectothermic vertebrate that has **SCALY** skin, **LUNGS** to breathe, and lays **EGGS** on land. They usually have a ★ **3**-chambered heart, but crocs have ★ **4**.

(E) How do reptiles keep water inside their bodies?

Thick skin to keep water inside their bodies

Kidneys to help them conserve water

Tough-shelled eggs to help keep water inside the egg for the young



*Do you know ...
What is our state
reptile?*

Painted Turtle

Reptiles



What did you add to your chart?

Reptiles	
-----------------	--

F) A **BIRD** is an endothermic vertebrate that lays **EGGS**, has **LUNGS** and a **4**-chambered heart. They have wings with **FEATHERS** and nearly **HOLLOW** bones to help them fly.

(G) Give an example of an adaptation that helps a bird survive in its habitat.

Owls – Sharp vision and hearing helps them hunt at night

Wild Turkeys – Use their “gobble”, tail feathers, and head movement to attract females

Ostriches – Able to run at fast speeds to escape from predators

Buntings – Uses its bill to eat seeds it finds

Bug Eaters (Swallows) – Able to catch insects while it flies



Do you know ... What is our state bird?

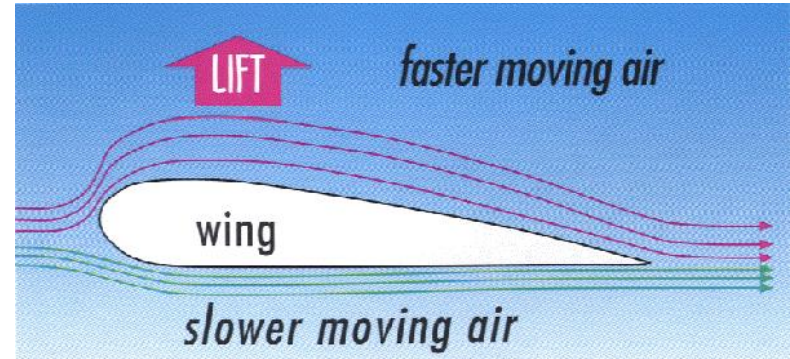
Cardinal

HOW DO BIRDS FLY?

Moving air exerts **pressure** and the **faster** the air moves, the more pressure it exerts. The difference in pressure above and below the **wings** as a birds moves through the air produces an **upwards** force called **lift**. Birds also have **large muscles** in their chest to help with flight.

BERNOULLI EFFECT

A famous investigator named Daniel Bernoulli discovered that air flows faster over the top of a curved wing than below the wing.



WHAT ARE THE THREE TYPES OF BIRD FLIGHT?

FLAPPING, SOARING/GLIDING, and DIVING

WHICH TYPE OF BIRD FLIGHT IS THE FASTEST?

DIVING

*Watch Eyewitness: Birds
& add information to your chart!*

What did you add to your chart?

Birds	
--------------	--

(H) **MAMMALS** are endothermic vertebrates with skin covered with **FUR** or **HAIR**. They have a **4**-chambered heart and **MAMMARY** glands to produce milk for their young.

(I) Mammals that lay eggs are called **MONOTREMES**, while **MARSUPIALS** have pouches for their young during early stages of development. **PLACENTAL** mammals develop inside the mother's body with materials exchanged between the mother and embryo through the **PLACENTA**.

Do you know ...

What is our state mammal?

White-tailed Deer

MONOTREMES – Egg-laying mammals



Watch the video
and be ready to
answer a few
questions!



Platypus



Echidna (Spiny Anteater)

1. Which animal is about the same size as an adult platypus?
A. Rabbit **B. Beaver** C. Wolf
2. What does “platypus” mean?
A. Flat foot B. Flat nose C. Duck-like snout
3. Which feet on a platypus are webbed?
A. Front feet B. Back feet **C. Both front and back feet**
4. Which feet on a platypus have spurs?
A. Front feet **B. Back feet** C. Both front and back feet
5. How many compounds are in its venom?
A. 20 B. 25 **C. 30**

MARSUPIALS – Carry immature young in a pouch



Koala



Opossum



Sugar
Glider



Kangaroo



Watch the video and be ready to answer a few questions!

1. Which is the most common of all Australian marsupials?
A. Kangaroo B. Koala **C. Opossum**
2. Which type of kangaroo grows to be the biggest in the world?
A. Gray **B. Red** C. Black
3. What is a baby kangaroo called?
A. Kit B. Swampy **C. Joey**
4. Which is larger: **a kangaroo** or a wallaby?
5. How far away can a wallaby hear a predator?
A. 50 yards **B. 100 yards** C. 1000 yards
6. How fast can a kangaroo move?
A. 10 mph B. 20 mph **C. 30 mph**

**Worth a chuckle
or two ...**



PLACENTAL – Mothers have a placenta and feed young milk



Watch the video
and be ready to
answer a few
questions!

1. TRUE or FALSE? Placental mammals give birth to fewer young than other vertebrates and have a lower survival rate.
2. How long does a young orangutan stay with its mother?
A. 8 months B. 8 years C. 18 years
3. How many species of mammals exist on Earth?
A. 4100 B. 7500 C. 8600
4. Which of the following is NOT a marine mammal?
A. Whales B. Porpoises C. Sharks

MONOTREMES



What is the only marsupial native to the United States?

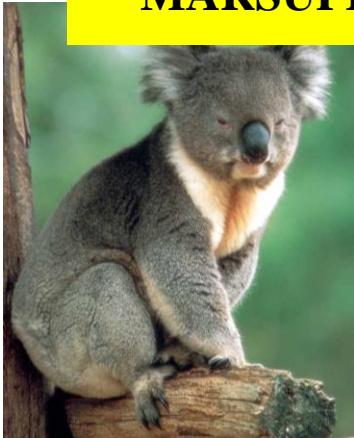
Opossum

Which placental mammal group is the largest?

Rodents (38%)



MARSUPIALS



PLACENTAL



Watch Eyewitness: Mammals & add information to your chart!

How would these mammals be classified?

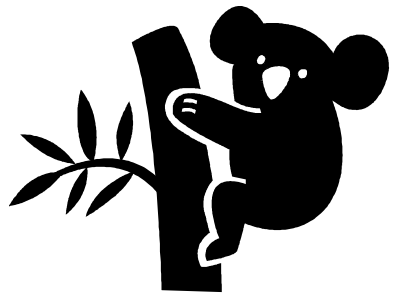


What did you add to your chart?

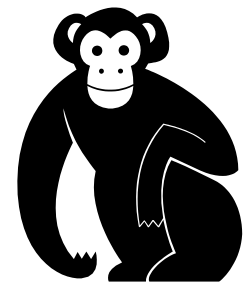
Mammals	
----------------	--



Classy Vertebrates



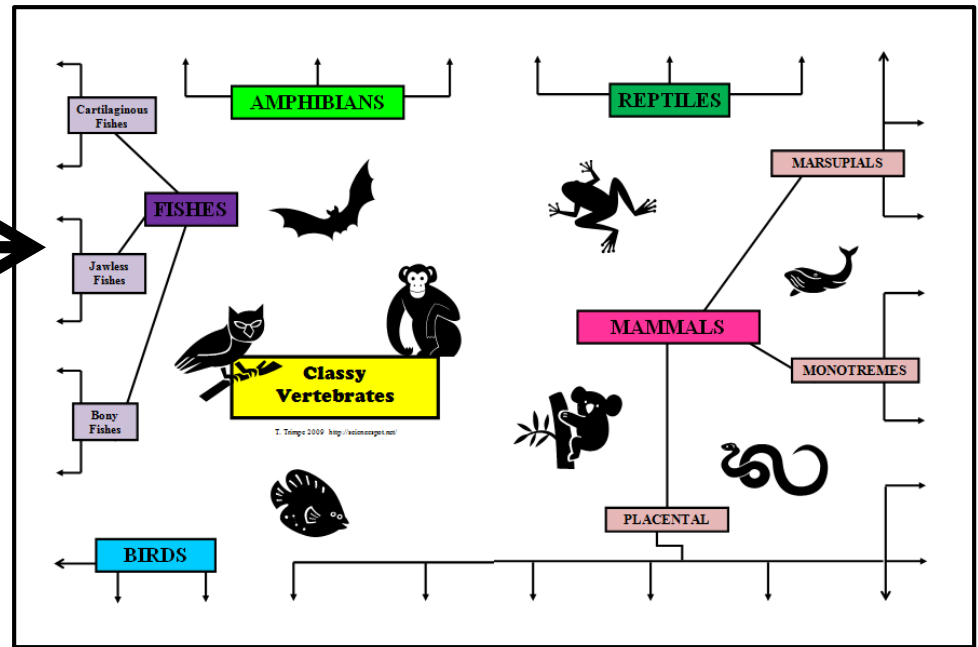
Can you meet the challenge?



Activity Directions:

1 – Work with your partner to place each “critter card” in its correct location around the edges of the classification mat.

2 – When you are done, have your teacher check your answers.

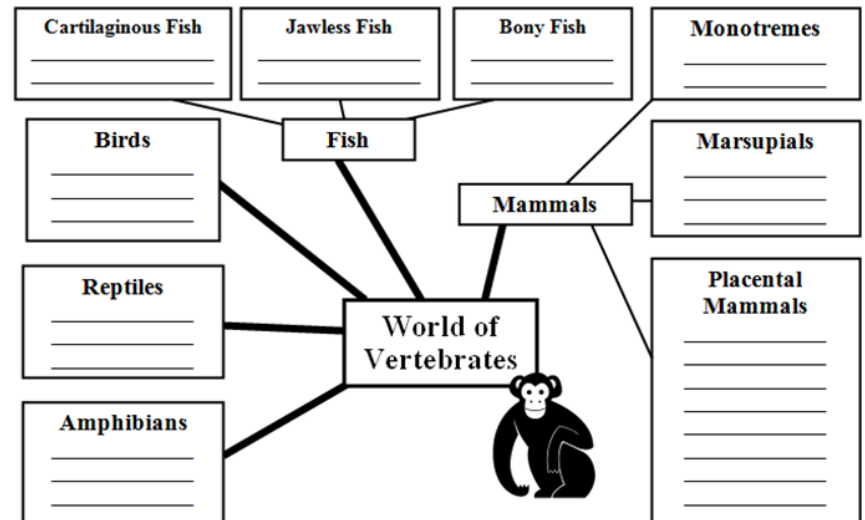


Glue the worksheet on
page ____

3 – Write the names of the organisms in the correct location on your worksheet.

American Toad
Armadillo
Bald Eagle
Blue Whale
Cardinal
Chimpanzee
Chipmunk
Duckbill Platypus
Great White Shark
Green Tree Frog
Hagfish
Hippopotamus
Indiana Bat
Kangaroo
Koala
Komodo Dragon
Lamprey
Opossum
Perch
Polar Bear
Puffin
Rainbow Trout
Rattlesnake
Red Fox
Sea Turtle
Spiny Anteater
Sting Ray
Tiger Salamander

Classy Vertebrates - Write each animal's name in the correct box.



CHALLENGE RULES

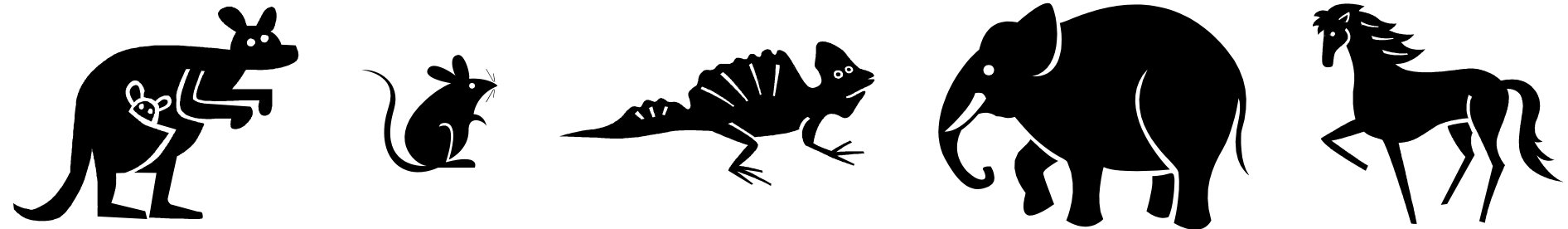
1 – Have your timer shuffle the cards and place in ONE pile on the table.

2 – Say “GO” to start the timer and then pick up the cards and start classifying.

3 – Say “Stop” when you are done to stop the timer when you are done. Have a teacher check your answers.

4 – If all your answers are correct AND you completed the task in 60 seconds or less, write your name on the board and get a piece of candy!

NOTE: If you get a better time, you can change your time on the board, but you do not get another piece of candy!



Classification Masters – 60 seconds or less

NOTE: If you get a better time, you can change your time, but you do not get another piece of candy!