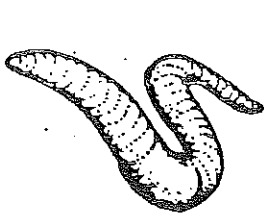


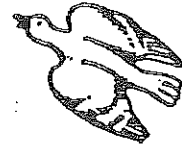
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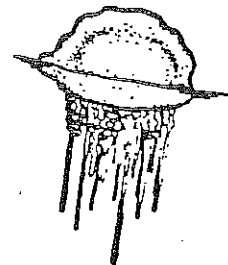
THE



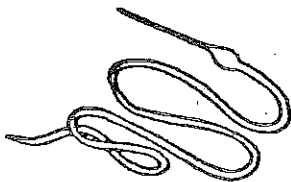
ANIMAL



KINGDOM



PHYLUM CHORDATA



*This packet represents information you need to study to prepare for the test on Animals. You are responsible for completing the worksheets and color plates enclosed. Anything within this packet is a possible test question. The test will be on*



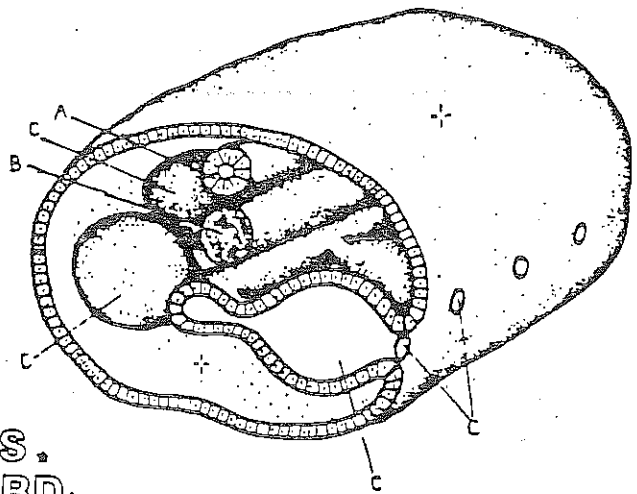
*NOTE: A deduction of 10 points will be given for any replacement packet.*

Name:

Date:

Period:

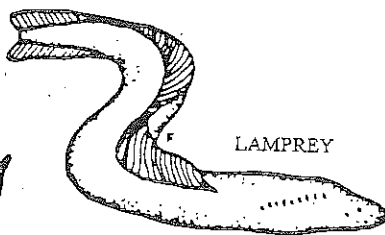
# PHYLUM CHORDATA.



CHORDATE CHARACTERISTICS.  
 DORSAL, HOLLOW NERVE CORD.  
 NOTOCHORD.  
 PHARYNGEAL POUCH.  
 GILL SLITS.

## CHORDATA.

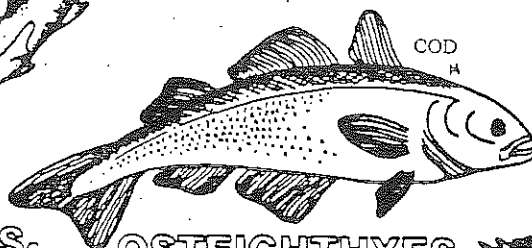
### VERTEBRATA.



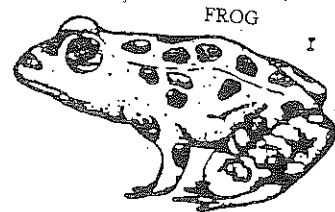
### AGNATHA.



SHARK



COD

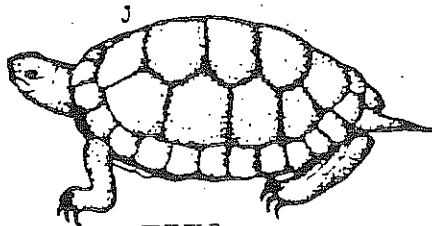


FROG

### AMPHIBIA

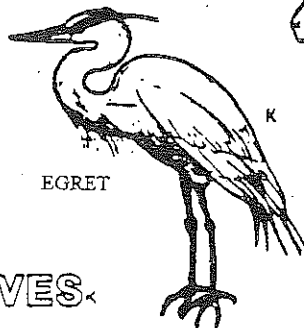
### CHONDRICHTHYES.

### OSTEICHTHYES.



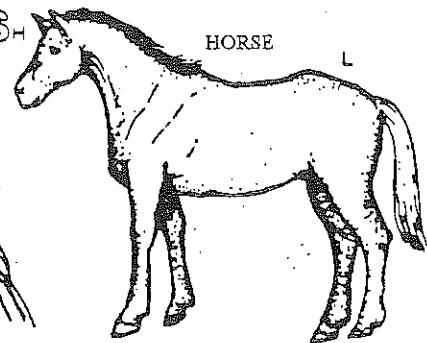
TURTLE

### REPTILIA.



EGRET

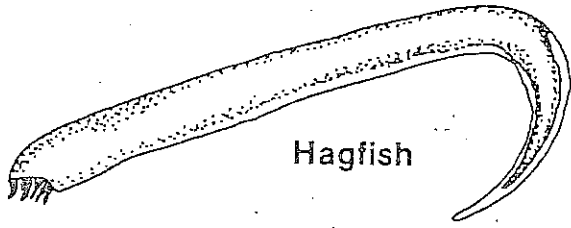
### AVES.



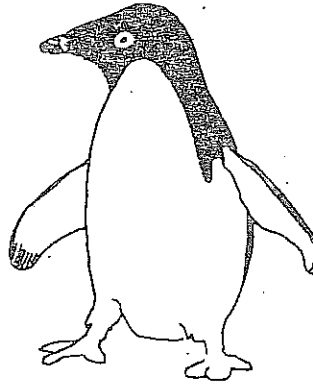
HORSE

### MAMMALIA.

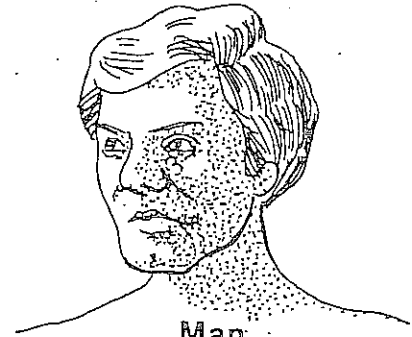
### Vertebrates



Hagfish



Penguin



Man

Kingdom: Animal

Phylum: Chordata (kor•DAT•a) means "having a cord"

Subphylum: Vertebrata (vert•a•BRAT•a) means "having vertebrae"

The chordates are animals that have a notochord (stiff rod) inside them at some point in their development. The vertebrates are a group within this phylum. Small bones or a tough fiber called cartilage replaces the notochord of vertebrates. These animals then have a backbone made up of little pieces called vertebrae (VERT•uh•bree).

All of the vertebrates have all ten systems. They are very complex animals. They also have the following general characteristics: 1) An endoskeleton (an inner skeleton); 2) A backbone; 3) Eyes, nostrils and a mouth on the head; 4) Usually, two pairs of limbs. Each vertebrate also has the characteristics peculiar to its particular class. For example, a

bird has all of the above characteristics as well as feathers. It also has other special features which make it a bird.

The vertebrates are divided into 3 classes of fish and 4 other classes of animals.

- 1) Jawless Fish — lampreys and hagfish
- 2) Cartilage Fish — sharks and rays
- 3) Bony Fish — perch, salmon, etc.
- 4) Amphibians — frogs, toads, salamanders
- 5) Reptiles — turtles, snakes, lizards, etc.
- 6) Birds — penguins, ducks, sparrows, etc.
- 7) Mammals — bat, kangaroo, man, etc.

Each class of vertebrates is more complex than the previous one. The last class, mammals, includes the most complex and highly organized animal — man.

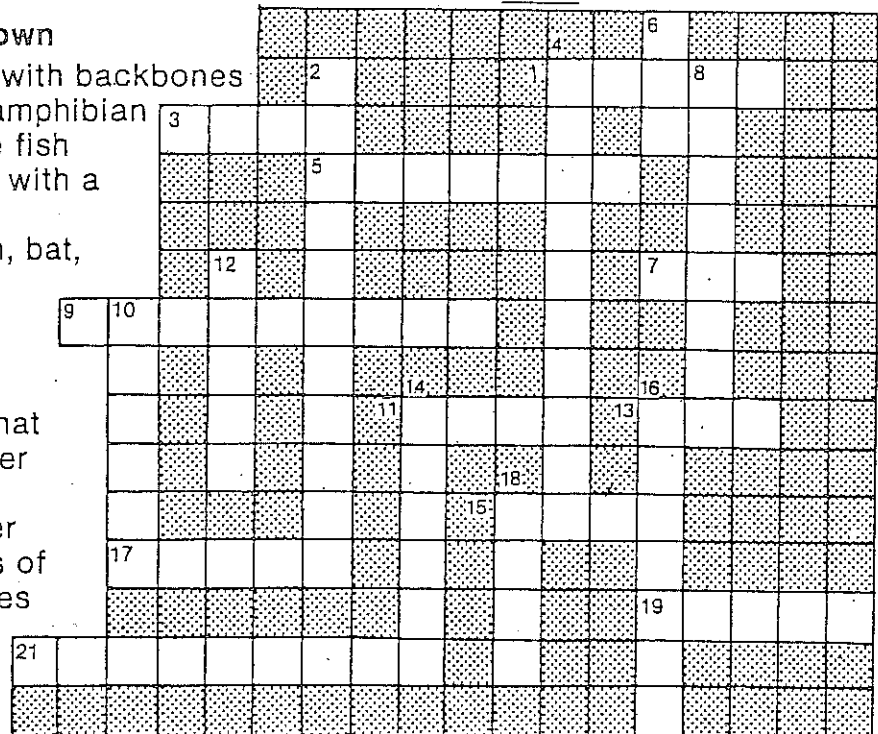
Complete the crossword:

Down

Across

1. Limbless reptile
3. A perch skeleton is mostly \_\_\_\_\_
5. Turtle or snake
7. Most complex animal
9. Frog, toad or salamander
11. Amphibian, but not a frog
13. Mammal we get bacon from
15. Was a tadpole as a baby
17. Vertebrates usually have 4 \_\_\_\_\_
19. "Endo"
21. A tough fiber

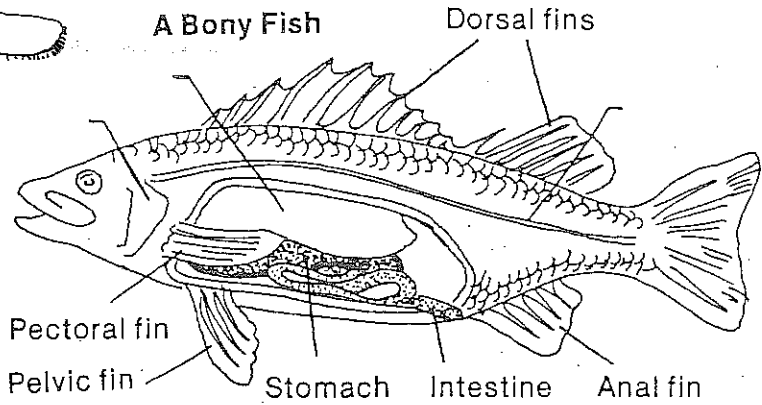
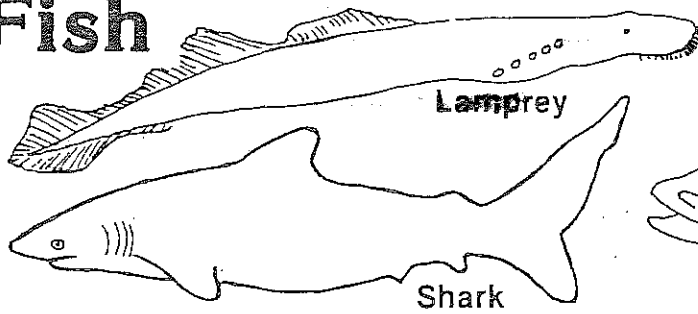
2. Animals with backbones
4. Kind of amphibian
6. Cartilage fish
8. Mammal with a pouch
10. Man, lion, bat, etc.
12. Vicious cartilage fish
14. Reptile that likes water
16. Jawless scavenger
18. 3 classes of vertebrates



# CHORDATE CLASSES OF FISH

## Three Classes of Fish

### Fish



Kingdom: Animal  
Phylum: Chordata  
Subphylum: Vertebrata

3 Classes: *Agnatha* (Ag•NATH•a) means "jawless"  
*Chondrichthyes* (Kon•DRIK•the•eez) means "cartilage fish"  
*Osteichthyes* (OS•tee•IK•the•eez) means "bony fish"

#### Jawless Fish

The jawless fish are the most primitive and oldest vertebrates. They include the hagfish and the lamprey. The hagfishes and lampreys are almost cylindrical animals without paired fins or jaws. (The next two classes of fish have paired fins and jaws.) Hagfishes are scavengers (eat dead or decaying matter), and lampreys are parasites. These fish must suck on the bodies of other fish or filter their food. They cannot chew. Like the next class of fish, they have no bone — only cartilage.

#### Cartilage Fish

The cartilage fish class is composed of sharks and rays. Like the jawless fish, sharks and rays have no bone, only cartilage. But they have paired fins and jaws. Most sharks are notorious carnivores (meat eaters) and scavengers. Some rays have poison spines on their backs or tails to defend themselves.

#### Bony Fish

The bony fish have both bone and cartilage. These include familiar fish such as the perch, mackerel, bass, catfish, etc. One important adaptation (change that makes them better suited to their surroundings) of many bony fish is the swim bladder. By changing the amount of gas in this sack above the stomach, the fish is able to stay at any depth without moving a muscle. (Sharks must swim constantly to stay at the same depth.) Bony fish also have paired fins and jaws.

All of the fish discussed above have gills to take oxygen out of the water that passes over them. In the first two classes of fish there is a separate gill slit (opening) on the side of the head for each gill. Bony fish have an operculum (covering) over these gills. Fish also have lateral line systems along the sides of the body for detecting sound in the water.

I. Label the bony fish above with: operculum, lateral line, swim bladder.

II. Define the following:

- scavengers \_\_\_\_\_  
adaptation \_\_\_\_\_  
lateral line system \_\_\_\_\_  
operculum \_\_\_\_\_

III. Answer the following:

1. Tell two ways the cartilage fish are more advanced than the jawless fish:

\_\_\_\_\_

2. Tell two ways all bony fish are more advanced than the cartilage fish:

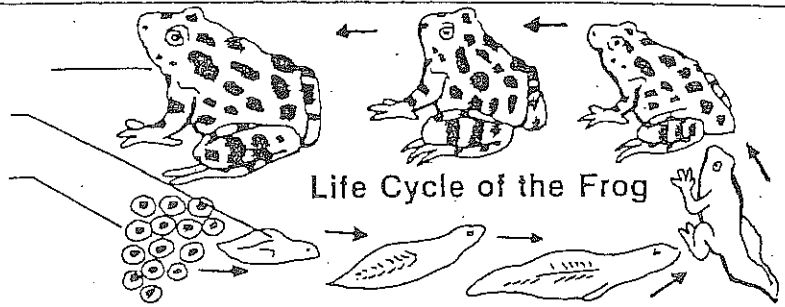
\_\_\_\_\_

# CHORDATE CLASS

## Members, Evolution & Characteristics

# Amphibians

Kingdom: Animal  
 Phylum: Chordata  
 Subphylum: Vertebrata  
 Class: Amphibia (am•FIB•ee•uh)  
 means "double life"



Amphibians are another class of vertebrates. Amphibians include frogs and toads, salamanders and newts, and some rare wormlike animals. The name amphibian means "double life". This refers to the fact that the young forms or tadpoles have gills and must live in water. The adult amphibians have lungs and may live on land. (Lungs allow an animal to take in oxygen from the air.) The life cycle of the frog is shown above. It explains the metamorphosis (change of form) from egg, to tadpole, to adult frog.

lungs. This and other evidence makes scientists think that amphibians probably came from fish which became adapted for (suited for) life on land.

As you read this list of amphibian characteristics, see which ones explain why amphibians need a moist habitat:

1. Amphibians have gills when young but have lungs as adults.
2. Amphibian skin is moist. Amphibians absorb some oxygen through the skin.
3. Amphibian eggs do not have a shell.
4. Most amphibians have poison on their skin and in the jelly surrounding their eggs.
5. Amphibians must lay their eggs in water (or in a damp place).

Fossils show that 370 million years ago there were fish that resemble the modern Coelacanth which recently was caught near the coast of Africa. This fish has short, stubby fins that resemble legs. It also has simple

Answer the questions in the space provided. Then use the circled letters to write the general name of a class of vertebrates in the box:

--	--	--	--	--	--	--	--	--	--

Young frogs that have gills

	○		○				○
--	---	--	---	--	--	--	---

How amphibians get oxygen through the skin

○	○					○	
---	---	--	--	--	--	---	--

Fish with short, stubby fins and simple lungs

						○	○
--	--	--	--	--	--	---	---

Change of form

			○					○	
--	--	--	---	--	--	--	--	---	--

I. Label the drawing above with: egg mass, tadpole, adult frog.

II. Answer the following questions:

1. Name 4 characteristics of amphibians which explain why amphibians need moist habitats:

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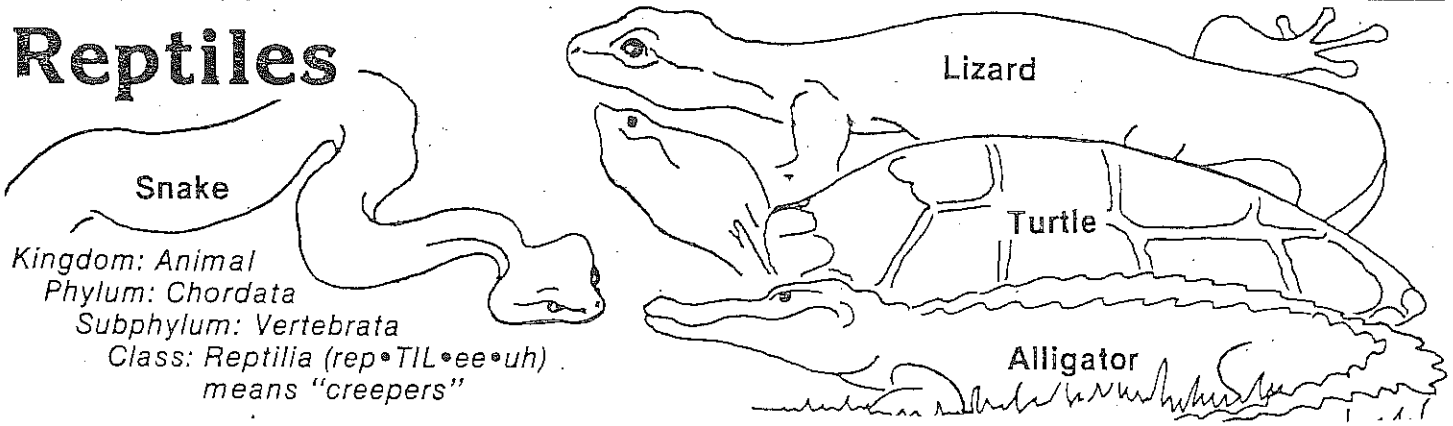


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2. How do fossils show a link between fish and amphibians?

---

### Reptiles



Kingdom: Animal  
 Phylum: Chordata  
 Subphylum: Vertebrata  
 Class: Reptilia (rep•TIL•ee•uh)  
 means "creepers"

Reptiles are yet another class of vertebrates. They, of course, have all the characteristics of animals, chordates, and vertebrates. They are more advanced than the amphibians and are well adapted for life on land. Fossils from two hundred million years ago tell us that reptiles ruled the land during the Age of Dinosaurs. The dinosaurs are all extinct now, but 4 of the 16 major groups of reptiles have relatives which are alive today.

Reptiles include turtles and tortoises, crocodiles and alligators, and lizards and snakes. Reptiles live on land, in fresh water, in brackish (slightly salty) water and sea water. Even though many of these animals live in the water, they must return to the land to lay their eggs.

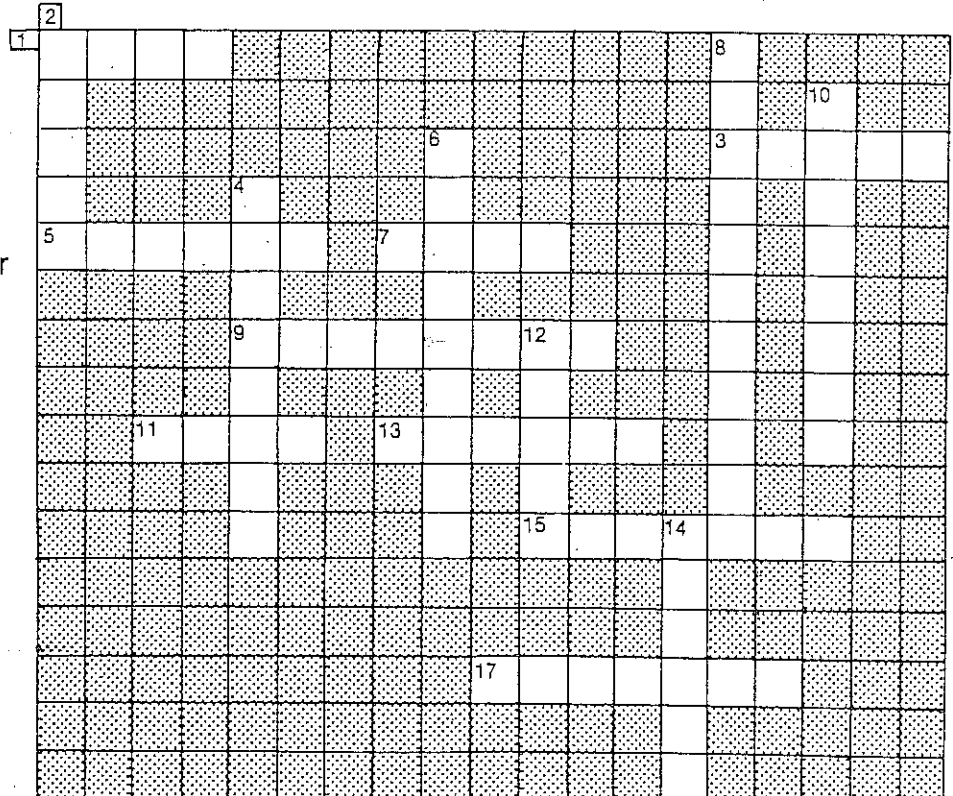
Complete the following crossword:

#### Across

1. Reptiles lay eggs on \_\_\_\_.
3. \_\_\_\_ plates on the back.
5. protective covering
7. food for embryo
9. land turtle
11. something in brackish water
13. reptile whose tail can grow back
15. no longer living
17. bones turned to stone

#### Down

2. Reptiles breathe with \_\_\_\_.
4. class name
6. man-eating reptile
8. drying out  
slightly salty
10. limbless reptile
14. Yolk feeds the embryo \_\_\_\_ the egg.



As you read this list of reptilian characteristics, see which ones explain why reptiles are well adapted for living on land:

1. Reptiles have lungs to get oxygen from the air throughout their entire life cycle.
2. Eggs have a limy or leathery shell and yolk (food) to feed the embryo growing inside.
3. Reptiles have scales or horny plates to keep them from drying out.
4. Reptiles are cold-blooded. (Their temperature depends on that of their surroundings.)
5. Reptiles must lay eggs on land.

One of the major problems faced by animals that live on land is dehydration or drying out. Reptiles have several adaptations which help them overcome this problem. The shell on their eggs and the scales or horny plates on adults are a protection against dehydration.

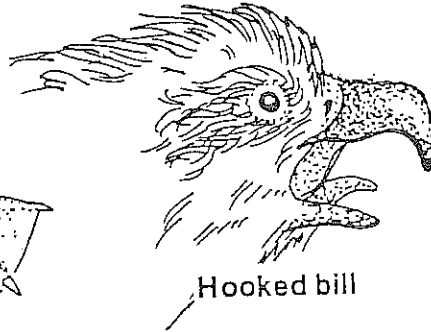
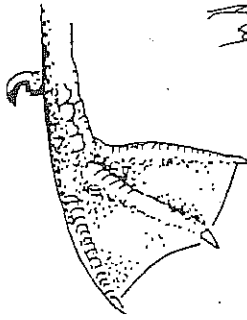
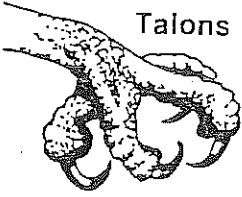
# HORDATE CLASS

## Evolution, Habitats & Characteristics

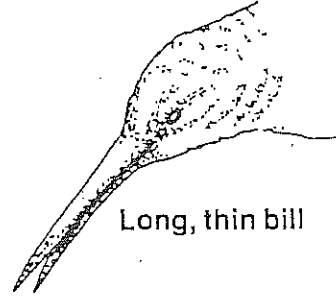
### Birds

Webbed feet

Talons



Hooked bill



Long, thin bill

Kingdom: Animal

Phylum: Chordata

Subphylum: Vertebrata

Class: Aves (A•véez) means "birds"

Birds are another class of vertebrates. Their internal (inside) structure is more complex than that of the reptiles but less complex than the mammals'. (Mammals make up the highest class of animals.) It is thought that birds probably evolved from reptiles. Fossils show that a dinosaur with feathers existed 150 million years ago. Perhaps this animal, named Archaeopteryx (Ark•ee•OP•ter•rix), is an ancestor of birds living today.

Birds are well adapted for living on land. Since they are warm-blooded (able to maintain their body heat independent of their surroundings) and have a covering of feathers, they can live in very hot or cold habitats. The penguin is well suited to its chilly environment (surroundings) in the Antarctic.

The following list of characteristics shows how birds are well adapted for flying and for living on land:

1. Birds have feathers.
2. Birds have wings instead of arms.
3. Birds have a beak or bill instead of teeth.
4. Birds are warm-blooded.
5. Birds lay eggs with hard shells and incubate them (keep them warm).
6. Birds are strongly social. One or both parents care for the helpless young.

Although the basic body structure is the same for all birds, the beak and feet are modified to help in gathering food: For example, birds of prey such as owls have hooked bills, while woodpeckers have long, thin bills for snatching insects off trees. Ducks and penguins have webbed feet for swimming, while hawks and eagles have long talons (sharp claws) for grasping prey.

Read the paragraphs above carefully and answer the following:

1. Name two characteristics of birds which are related to the fact that most of them fly. (Some birds such as the ostrich and penguin don't fly.) \_\_\_\_\_

2. How long ago did birds begin to appear on the earth? (The exact answer is not given, but if you read carefully, you can estimate the answer.)

Answer: more than \_\_\_\_\_ years ago.

3. The internal structure of birds is more complex than that of the \_\_\_\_\_ but less complex than that of the \_\_\_\_\_.

4. Birds of prey are those which catch and eat other animals. Why would a hooked bill and sharp talons help such a bird? \_\_\_\_\_

# CHORDATE CLASS

## Members, Habitats & Characteristics

### Mammals

Kingdom: Animal

Phylum: Chordata

Subphylum: Vertebrata

Class: Mammalia (mam•MALE•ee•uh)

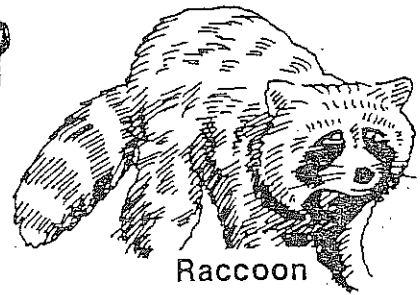
means "of the breast"



Dolphin



Man



Raccoon

There are 15 major orders (subgroups) of mammals, the class containing the most complex vertebrates. Mammals include animals as diverse as the whale, bat, opossum, giraffe, and the most complex and intelligent mammal — man. Mammals live in a variety of habitats in the sea (whale, seal, walrus) and on land. One mammal, the bat, can actually fly.

Fossils show us that mammals are the newest animals. The main characteristics of this class are:

- 1) Mammals have hair.
- 2) Mammals nurse their young (feed them milk) and care for them diligently.
- 3) Mammals are warm-blooded (able to maintain their body heat independent of their

- surroundings).
- 4) Mammals have the largest cerebrum (thinking center) compared to the rest of the brain of all the vertebrates. (Presumably, mammals are the most intelligent vertebrates.)

Mammals take much better care of their young than do the lower vertebrates. The duck-billed platypus and the spiny anteater lay eggs. All other mammals give birth to live offspring. The mother then feeds the young with milk made by the mammary glands in her breasts. The marsupials, an order of mammals including the koala bear and the kangaroo, carry their young with them in a little pouch.

I. Read the paragraphs above carefully and then complete the following acrostic:

M \_ \_ \_ \_ \_

Mammals which carry their young in a pouch.

A \_ \_ \_ \_ \_

Mammals belong to this kingdom.

M \_ \_ \_

\_\_\_\_\_ is the most complex animal.

M \_ \_ \_ \_ \_

These make milk in the breast.

A \_ \_ \_

\_\_\_\_\_ mammals are warm-blooded.

L \_ \_ \_ \_ \_

Most mammals give birth to \_\_\_\_\_.

II. Choose the best answer to complete the following. Use each answer at most one time:

marsupials land nurse newest spiny anteater mammals oldest mammary glands

warm-blooded sea intelligent fossils air hair pouch cold-blooded eggs bat

1. \_\_\_\_\_ show us that mammals are the \_\_\_\_\_ animals.
2. Man is the most \_\_\_\_\_ of all the vertebrates.
3. \_\_\_\_\_ such as the koala bear carry their young in a \_\_\_\_\_.
4. Female mammals \_\_\_\_\_ their young by feeding them with their breasts.
5. Mammals can be found in the \_\_\_\_\_, in the \_\_\_\_\_, and on the \_\_\_\_\_.
6. Since seals are \_\_\_\_\_, they can maintain their body heat.
7. The duck-billed platypus and the \_\_\_\_\_ are mammals that lay \_\_\_\_\_.
8. Since whales are mammals, we know they must have \_\_\_\_\_.
9. Milk is produced by the \_\_\_\_\_ in the breasts.
10. The opossum, tiger, rat, cow, walrus, and man are all \_\_\_\_\_.
11. A \_\_\_\_\_ is warm-blooded, hairy and bears live young. It is a unique mammal and not a bird.



CLASS NAME OF SUBPHYLUM VERBRATA	Agnatha	Chondrichthyes	Osteichthyes	Amphibia	Reptilia	Aves	Mammalia
HABITAT AIR, LAND, WATER							
INTEGUMENTARY BODY COVERING							
RESPIRATION: SKIN VS. GILLS VS. LUNGS							
CIRCULATION: # HEART CHAMBERS							
REPRODUCTION: INTERNAL VS. EXTERNAL FERTILIZATION							
LIVE BIRTH OR HATCHED							
HOMEOSTASIS: ENDO VS. ECTOTHERM							