Chapter 4 Introduction to Animals

Objectives
Identify four functions that enable animals to meet their basic needs.
Explain how animals are classified.

One thing to keep in mind:
Scientists do not know everything there is to know about animals.

Scientists are always learning and discovering new things.

What are the functions of Animals?
Multicellular
Heterotrophs

Main Function
obtain food and oxygen
keep internal conditions stable
move
reproduce

Adaptations
structures and behaviors that allow animals to perform their functions

example
claw designs
tongues
necks
colors

Video - Animal Adaptations

Inquiry Warm-up







1. Write notes about each organism.

2. What do they all share?

3. Are they all living organisms?

4. Are all animals considered to be a living organism?

5. Are these all animals?

Review
What do animals have in common?
need food, move around, reproduce

How are animals different?
live in different environments
look different
eat differently

How do animals on land take in oxygen?
breathe

What does it mean for an animal to reproduce?
to create more animals

Why might it be important for an animal to move?
escape from predators or find food

What is homeostasis?
maintaining of a stable or constant internal environment

Mar 4-10:30 AM

Review - continued
Draw an animal on a sheet of paper.
List three things that make it an animal.

How is an animal different from a plant?
animal eats other things, breathe oxygen, it can move

How is an animal similar to a plant?
both are living
both can reproduce

How are Animals Classified?
Animals are classified on how they are related to other animals which is determined by an animal's body structure, the way the animal develops and its DNA

What does classify mean?
sort into groups based on similarities

All animals are vertebrates or invertebrates.

Vertebrate
has backbone

Invertebrate
"in" means not
no backbone

Look at page 140-141

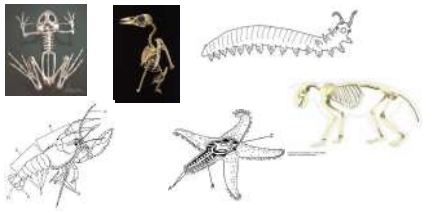
Review
What is a vertebrate?
has a backbone

What is an invertebrate?
animal without a backbone

Why might scientists classify a dog and an eagle in the same group?
both have backbones

Why might scientists classify these two animals in different groups?
dogs have hair, walk
eagles have feathers, fly

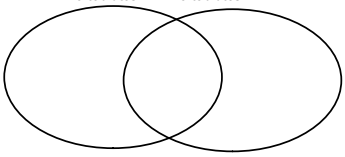
Classifying Lab
1. Make observations about each organism.



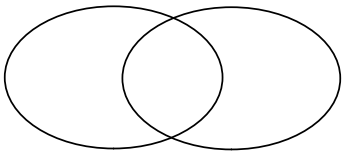
2. Group the organisms on similar observations.
3. Write a detailed description of each group so that if you if you gave your descriptions to another group they would group them the same.

What is similar and different between the following items?

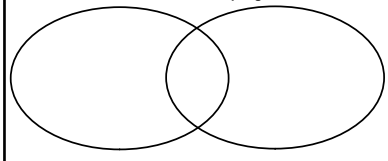
Invertebrates Vertebrates



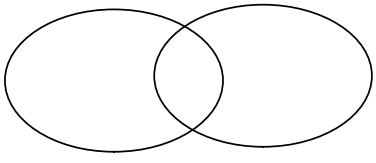
Reptile Amphibian



Cnidarians Sponges



Fish Starfish



Mar 4-1:24 PM

Lesson 2 - Animal Body Plans

Objectives
Describe levels of organization in animal bodies.
Infer animal body structures based on their symmetry.




How are animal bodies organized?
cells → tissue → organ → organ system

letters → words → sentences → paragraphs

Cells
small, organized, specialized

Tissue
a group of similar cells that share a specific function

muscle
cells that combine to help you move

Organ
is a group of tissue
performs more complex functions

Organ System
groups of organs

Review
List the order of organization in an animals body plan.

cell, tissue, organ, organ system

How is Symmetry Related to Body Structure?

Symmetry
pattern on one side is the mirror image of other side

Types
Asymmetrical
no symmetry



Radial Symmetry
if many lines divide through a central point where it would have mirror images
animals with radial symmetry live in water
can not tell difference between front and back
do not have heads
purpose of radial symmetry is the ability to take in information from all directions



Bilateral Symmetry
a line of symmetry that will divide the organism into two halves that mirror each other
have organ systems
most animals have heads at front end
most have specialized sense organs



Review
Can you identify a person by looking at either side of his or her face?
Yes, both sides are similar

When does an object have bilateral symmetry?
When one line can divide it into halves that are mirror images.

How does radial symmetry differ from bilateral symmetry?
An object with radial symmetry has many lines that go through a central point.

What advantage is bilateral symmetry to a land animal?
It enables the animal to have sense organs in the front and to be streamlined. The animal can move quickly yet be aware of what is in front of it.

What kind of symmetry does a sea star have?

How many lines of symmetry do these sea stars have?

What sense organs can you identify?

Where does a sea star live?

How does it move?

Further review
What do animals need to survive?
food, oxygen, maintain homeostasis, reproduce

What is an adaptation?
A trait or behavior that helps an organism perform its life functions.

How is an animal body organized?
cells - tissues - organs - organ system

Compare and contrast the 3 types of symmetry?

asymmetrical - no symmetry

radial symmetry - through a central point that divides it into two mirror halves

bilateral symmetry - divides animal in half into two identical halves

Mar 14-9:18 AM

Lesson 3 Introduction to Invertebrates

Objective
Identify the characteristics of invertebrates.
Describe the major groups of them.

Invertebrate Characteristic
no backbones
96% of know animals are invertebrates

Main Groups of Invertebrates

Sponges
asymmetrical
some specialized cells
no tissues or organs
live in water

Cnidarians
radial symmetry
do have some tissue
live in water
jellyfish/corals

Worms
bilateral symmetry
head and tail ends
tissues, organs, organ systems

3 major Phyla

flatworms
flat soft bodies with eye spots for detecting light

roundworm
smooth thin tubes
two body openings - mouth/anus

segmented worms
many linked sections - segments
have a brain
help detect food and predators

Mollusks
soft unsegmented body protected by a hard shell
hard shell lined with a thin tissue - mantle, this covers the internal organs and foot

3 Major Groups

Gastropod
snails
single shell or no shell
head
use foot to crawl

Bivalve
clams
two shells
simple nervous system
use foot to dig

Cephalopod
squid
external, internal or no shell
eyes for vision
brain
use foot to catch prey

Arthropods
crab/spiders
hard outer covering
segmented bodies
pairs of appendages
legs
wings
antennae

Echinoderm
internal skeleton
fluid-filled tubes
radial symmetry

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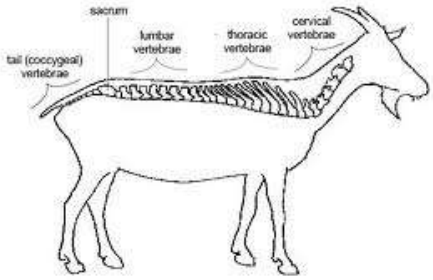
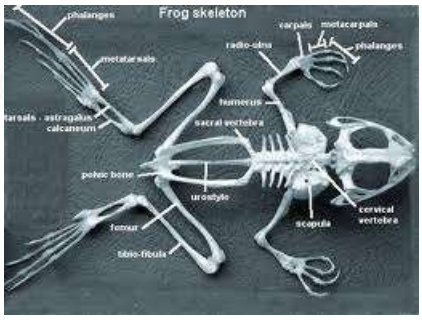
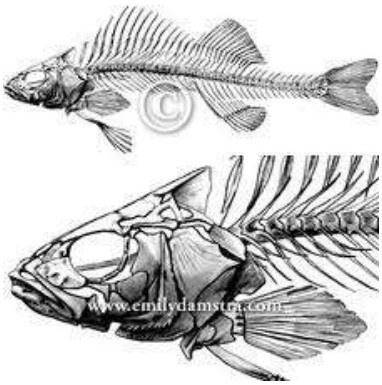

sacrum
lumbar vertebrae
thoracic vertebrae
cervical vertebrae
tail (coccygeal) vertebrae


Frog skeleton
phalanges
carpals
metacarpals
radio-ulna
phalanges
metatarsals
humerus
sacral vertebra
calcaneum
pelvic bone
urostyle
cervical vertebra
scapula
femur
tibio-fibula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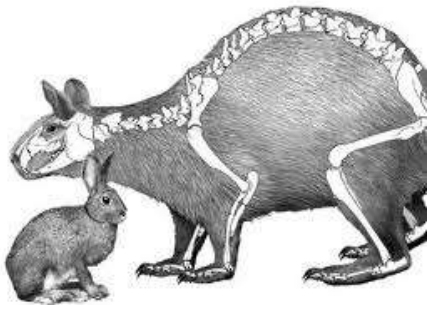
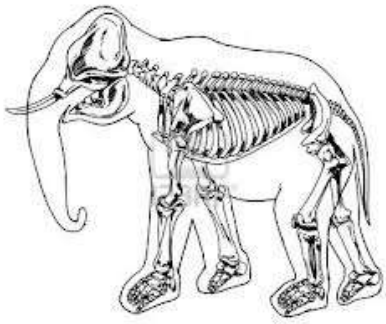




Apr 8-10:41 AM

Introduction to Vertebrates

Objectives:
Identify the characteristics of chordates and vertebrates.
Compare how vertebrates differ in the way they control body temperature.

Vertebrates belong to the Phylum Chordates. What is the Kingdom?
Animal

Chordates have 3 characteristics.

Notochord
flexible rod that supports the back

Nerve cord
runs down the back
connects brain to nerves

Throat pouches
an area that develops into gill slits
some dissappear before birth

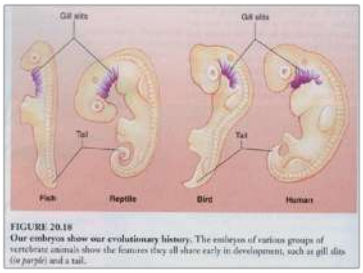
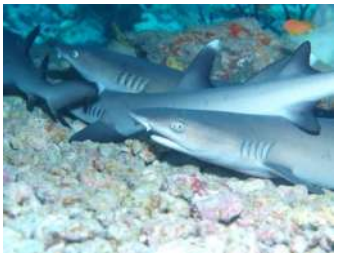


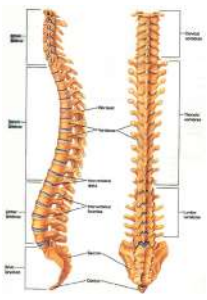
FIGURE 20.18
Our embryos show our evolutionary history. The embryos of various groups of vertebrate animals show the features they all share early in development, such as gill slits (in purple) and a tail.

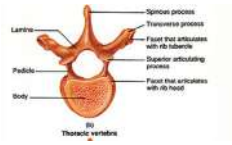

Whitetip reef sharks showing gill slits

Vertebrates have backbones.

Vertebrae - vertebra (singular)
stacks of bones that make up the backbone

each vertebrae has a hole in it to allow the spinal cord to pass





(b) Thoracic vertebra

How do vertebrates control body temperature?

Some vertebrates control body temperature through homeostasis. Others change with the environment.

Ectotherm
ecto = outside
produces very little body heat
some temperature change as the environment changes

Endotherm
endo = inside
regulates its own temperature

Ectotherm

Endotherm

Endotherm

Apr 8-8:23 AM

http://www.mhhe.com/biosci/genbio/virtual_labs/BL_16/BL_16.html

Apr 22-2:04 PM