

Essential Standard 2.1.2

⊙ Analyze how various organisms accomplish the following life functions through adaptations with particular environments and that these adaptations have evolved to ensure survival and reproductive success.

- > _____ and _____
- > _____
- > _____
- > _____

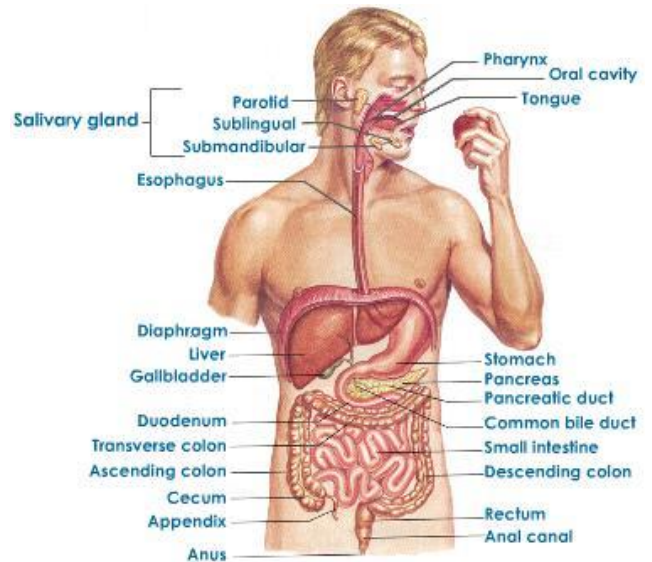
Transport and Excretion

⊙ Animals

- > Food _____ from the digestive system enters the _____ system where nutrients are delivered to cells throughout the body.

Digestive System

- Enzymes break down food into smaller components.
 - Mouth = _____ (carbohydrates)
 - Esophagus
 - Stomach = _____ (proteins)
 - Small Intestines (_____, _____, _____)
 - Large Intestines (absorbs _____)
 - Anus



Liver

- Removes excess _____ and stores it as _____.
- Converts _____ acids and _____ into energy to be used during metabolism.
- Stores _____ and minerals.
- Produces _____ for fat digestion.

Homeostasis

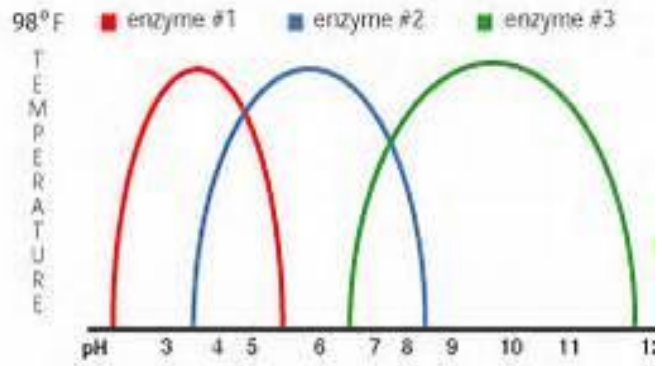
- Drinking too much during meals or not eating a well-balanced diet can alter the _____ of the stomach, making _____ harder.
- Not drinking enough _____ throughout the day can also decrease digestion because without water nutrients and _____ cannot flow in and out of _____.

pH Levels of Organs and Body Fluids Organ or fluid pH level

- Saliva _____ (slightly acidic to neutral)
- Blood _____ (slightly basic)
- Stomach _____ (very acidic)
- Pancreatic juice _____ (basic)
- Bile _____ (slightly basic)
- Small intestine _____ (slightly basic)
- Large intestine _____ (slightly acidic to slightly basic)
- Urine _____ (slightly acidic to neutral)

What enzyme (protein) would work best on stomach acid with a pH of 1.5-3?

- Enzyme 1
- Enzyme 2
- Enzyme 3

**Transport and Excretion**

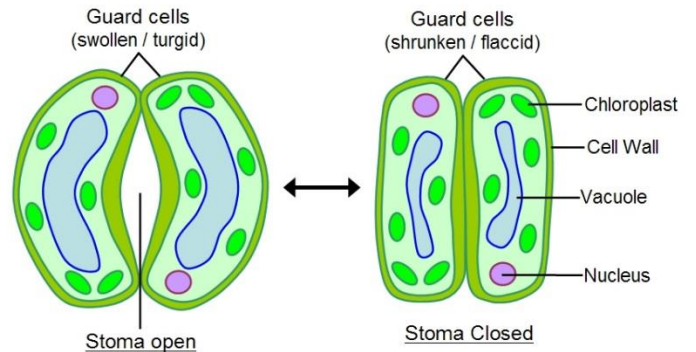
- **Plants**
 - _____ - **Water** travels through tissues called _____
 - **Sugar Food** (_____) travels through tissues called _____.
 - _____ - water and minerals enters directly through the plasma membrane and travels through the plant via _____.

Respiration

- Release of _____
- **Plants:** _____
- Cellular Respiration
 - Aerobic- requires _____
(animals, plants)
 - Anaerobic- _____
required (yeast, bacteria)

Stomata

- **Stomata** (sing. **stoma**) = pores in a leaf, mostly on the undersurface
- Each pore is surrounded by a pair of **guard cells**
- Guard cells can change shape to open or close the stoma



Aerobic Respiration

- ⊙ Animals
 - > _____ (mammals, reptiles, birds, amphibians)
 - > Diffusion through the _____ (amphibians, worms)
 - > _____ (fish and sharks)
- ⊙ Plants

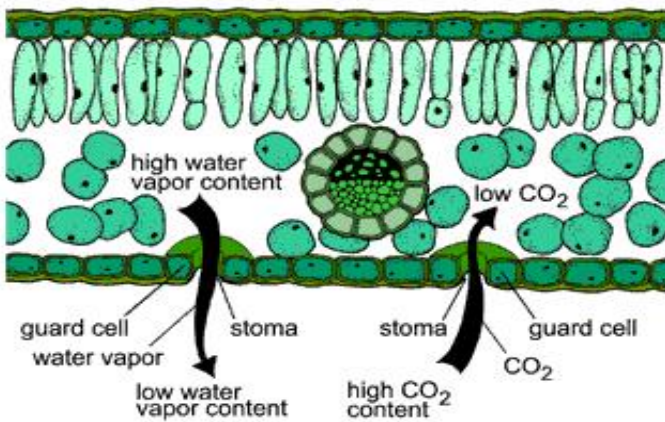


Figure 25. Stomata open to allow carbon dioxide (CO₂) to enter a leaf and water vapor to leave.

Aerobic Cellular Respiration

- Occurs in the _____ of animal and plant cells!
_____ + O₂ -> CO₂ + H₂O + _____

Anaerobic Respiration

- > _____ **fermentation** occurs in _____ and some bacteria, and produces _____ and ethyl _____.
- > **Lactic Acid fermentation** occurs in _____ cells and bacteria. A buildup of _____ acid is what causes muscle soreness.

Photosynthesis.....

- Occurs in the presence of light and in the _____ of plants, and some protists such as algae.
- The _____ energy is used to make sugar (glucose).
- Polymers are formed from simpler ones.
- $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{O}_2 + \text{glucose}$
 reactants products

.....Respiration

- > Occurs at all times in _____.
- > Releases ATP energy from _____
- > _____ substances are broken down into simpler ones.
- > Carbon dioxide and _____ are the end products.
- > _____ is taken in.

LABEL THE TREE WITH THESE TERMS---WRITE DOWN THE FUNCTION OF EACH PART:

XYLEM:

PHLOEM:

ROOTS:

LEAVES:

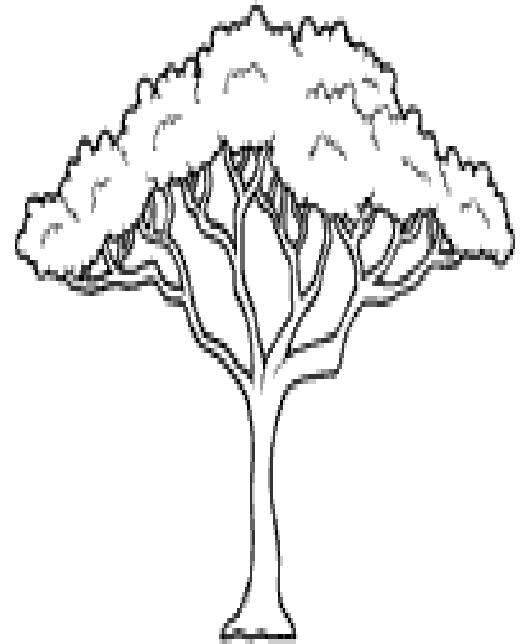
STOMATA:

WHERE DO THESE PROCESSES TAKE PLACE IN A PLANT? WHAT ARE THE REACTANTS AND PRODUCTS?

PHOTOSYNTHESIS:

AEROBIC CELLULAR RESPIRATION:

RELEASE OF GASES:

**Nutrition**

- Autotrophs- organisms that can make their own food (photosynthesis).
- Heterotrophs- organisms that consume food or decompose food.

Reproduction

- Sexual- _____ are needed to create offspring with variation.
- Asexual- gametes are not needed because an organism makes an exact _____ of itself.

Sexual Reproduction

- Animals- _____ and _____ make a _____, which grows into an _____, which grows into a _____.
- Plants- egg and _____ sperm make a seed which _____.
- Plants and Fungi- some make _____

Internal Fertilization

- Egg and sperm unite inside the organism.
 - Mammals- nourishment by the _____
 - Birds and Reptiles
Nourishment by _____ egg

External Fertilization

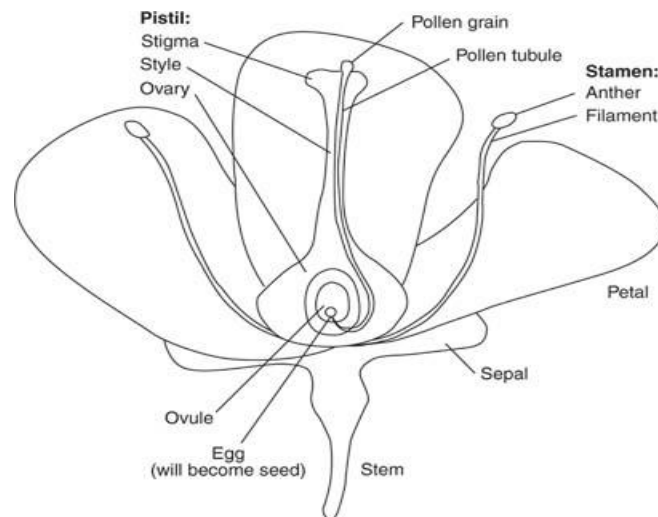
- _____ is needed for fertilization Egg and Sperm unite _____ of the organism.

Seed plants

- _____ - cone bearing plants

Seed plants

- _____ - flowering plants



Behavioral Adaptations

- ⊙ As an organism develops special behaviors which are

_____ behavior (born with it---in the DNA) or

_____ behaviors and important for _____.

Taxis (Innate)

- _____ (Termites release pheromones for communication)
- _____ (Plants response to light)
- _____ TO LIGHT

Migration (innate)

The seasonal _____ of a complete _____ of animals from one area to another (IMMIGRATION vs EMMIGRATION)

Estivation / Hibernation (Innate)

- A state of lower _____ activity
- Estivation- _____; heat and drought
- Hibernation- _____; cold and drought

Habituation (Learned)

- Habituation is when an organism stops _____ to a _____ after repeated exposure.

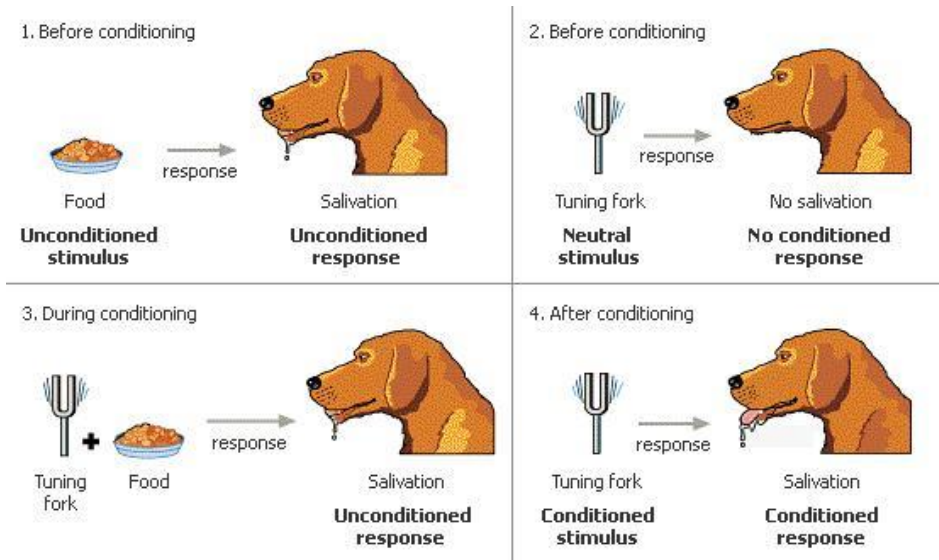
Imprinting (Learned)

- Imprinting is learning that occurs early in _____ that cannot be changed such as ducks and geese recognizing the _____ person they see as their mother.

Classical Conditioning (Learned) Stimulus association

- Ex: _____ dogs

Bell = dog _____ because he associates it with _____.



Trial and Error (Learned)

- _____ and _____

Camouflage

- ☉ To _____, _____, smell or sound such that it _____ in with their surroundings.

Critical Thinking

- ☉ **What structural adaptations do animals and plants have for feeding, reproduction and life on land?**
- ☉ **What behavioral adaptations do organisms have that help ensure survival?**
- ☉ **What are the reproductive advantages and disadvantages of internal and external fertilization?**
- ☉ **How do specific physiologic processes of transport, excretion, growth and development foster survival?**

Review Questions

1. Much of the oxygen in the earth's atmosphere
 - a. is produced as a waste product of cellular respiration in plants.
 - b. is released as a byproduct of photosynthesis.
 - c. is produced as a waste product of cellular respiration in animals.
 - d. is produced by tree frogs.

2. The vascular tissue that transports water and minerals from the soil to the rest of the plant is the
 - a. phloem.
 - b. phlegm.
 - c. leaf.
 - d. xylem.

3. Plants that make flowers are called
 - a. gymnosperms.
 - b. byrophytes.
 - c. gametophytes.
 - d. angiosperms.

4. Pollen contains
 - a. male gametes.
 - b. female gametes.
 - c. fruits.
 - d. a stigma.

5. Animal cells and bacterial cells both may have all of the following cell structures **except**
 - a. mitochondria.
 - b. DNA.
 - c. plasma membrane.
 - d. flagella.

6. PCR allows scientists to
 - a. rapidly make many copies of a gene or other DNA segment.
 - b. clone a recombinant DNA in bacteria.
 - c. ligate together two pieces of DNA from different sources.
 - d. all of the above.

7. Humans have _____ bases divided among _____ chromosomes.
 - a. 3 million, 23
 - b. 3 million, 23 pairs of
 - c. 3 billion, 23
 - d. 3 billion, 23 pairs of