

Remote Learning Packet

Please submit scans of written work in Google Classroom at the end of the week.

Week 8: May 18-22, 2020

Course: 9 Biology

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Weekly Plan:

Monday, May 18

Digestive system worksheet

Tuesday, May 19

Reproductive system worksheet

Wednesday, May 20

Body systems review day

Thursday, May 21

Body systems quiz

Friday, May 22

Attend office hours

Catch-up or review the week's work

Statement of Academic Honesty

I affirm that the work completed from the packet is mine and that I completed it independently.

I affirm that, to the best of my knowledge, my child completed this work independently

Student Signature

Parent Signature

Monday, May 11

Complete the *digestive system worksheet* using your textbook as a guide. The page numbers listed will be crucial for you to complete the worksheets *but do not take notes on these pages*. Use the worksheets to find and record the most important information from these sections. Self-grade the worksheets on Wednesday.

Tuesday, May 12

Complete the *reproductive system worksheet* using your textbook as a guide. The page numbers listed will be crucial for you to complete the worksheets *but do not take notes on these pages*. Use the worksheets to find and record the most important information from these sections. Self-grade the worksheets on Wednesday.

Wednesday, May 13

Use today to review for tomorrow's quiz. Challenge yourself to complete the quiz on the body systems *without* using your notes or textbook. The point is that *you* become a better scientist!

Take a look at the attached worksheets - they have all the correct answers. Use them to review your own work and prepare for the quiz.

Thursday, May 14

Take the Body Systems Quiz - good luck, you don't need it!

Friday, May 15

Use this day to attend office hours, catch up on work from this week, scan your documents, and enjoy the start of your weekend! *You do not need to include notes in your packet submission*, only the documents listed: body systems quiz.

Digestive System

Directions: Using the provided pages in your textbook to answer the following questions in complete sentences or fill in the blanks.

Structure (pp. 985-991)

- Sort the following structures of the digestive system according to if they come into direct contact with food: mouth, liver, esophagus, stomach, pancreas, small intestine, large intestine, gallbladder

DIRECT CONTACT	NO DIRECT CONTACT

- Using the structures listed in “direct contact” above, order them according to how food travels through the body:
 - _____
 - _____
 - _____
 - _____
 - _____
- The _____ is the upper boundary of the stomach and the _____ is the point where the stomach connects to the small intestines.
- The liver produces bile which is then stored and concentrated in the _____.
- The pancreas, because it secretes hormones and juices that help to neutralize stomach acid is a part of the _____ system and the _____ system.

Function (pp. 985-991)

- Name and describe the two types of digestion that occur in the stomach.

2. Explain how peristalsis moves food down the esophagus, into the stomach.

3. What is the primary function of the intestines? What structural feature of the small intestines allows it to perform its function well?

Reproductive System

NB: The cultural and social aspects of human reproduction are deeply personal and beyond the scope of this class. This worksheet will offer an overview of the physiology of human reproduction only.

Structure (pp. 1049-1051, 1052-1053)

List the organs of the human male reproductive system in order of their contact with a sperm cell.

1. Testis
2. _____
3. _____
4. Seminal vesicle
5. _____

List the parts of the human female reproductive system in the order of their contact with an egg cell.

6. Ovaries
7. _____
8. Uterus
9. _____

Function

10. The period of life before the reproductive system is functional is called _____.
11. The period of life when the reproductive system is developing is called _____.
12. The period of life marked by a functional reproductive system is called _____.
13. What is the final cause of the human reproductive system?

14. Is the reproductive system essential for survival?

15. The reproductive organs produce a unique type of cell, different from all other cells. What are these cells called, and how are they different?

16. What is the name of the process by which sex cells are produced?

17. Can a brother and sister be identical twins? If so, how? If not, why not?

18. Please read: Every other human system maintains the life of the human to which they belong. When that life comes to an end, so do the systems that supported it. The reproductive system is unique because it brings new lives into the world *that are ultimately capable of reproduction as well*. That is, the reproductive system brings about both new life and the potential for new life. This double significance means that human reproduction stretches out into the infinite future as generation after generation unfolds. Incredible!

Skeletal System KEY

Directions: Using the provided pages in your textbook to answer the following questions in complete sentences or fill in the blanks.

Structure (pp. 911-913, 915)

1. What are the two divisions of the skeletal system? Axial and Appendicular .
2. The membrane around bones that supplies nutrients and signals pain is called the periosteum .
3. Bones are composed of two main kinds of bone tissue: compact bone and cancellous or spongy bone .
4. What are the two kinds of bone marrow? Yellow and red .
5. List the three kinds of joints. Fixed joints , semi-movable , and movable joints .

Function (pp. 913-916)

6. Bone marrow is found at the center of many bones. What does it do? **Yellow bone marrow is an energy store of fat. Red marrow produces red blood cells, platelets, and white blood cells.**
7. Describe the action of two different types of movable joints:
 - a. **The shoulder joint is a ball-and-socket joint, meaning it can move in multiple planes due to the structure of the joint. The arm can move in all directions to a certain extent, including some slight rotation in the joint.**
 - b. **The semi-movable joints where vertebrae meet allow for some flexing and slight rotation, but remain very stable. The combination allows for movement while securing the spinal cord within.**
8. What is the function of fixed joints? **Fixed joints are found in the skull where bones have essentially fused together.**
9. Ligaments connect bones to bones .
10. Summarize how bones elongate.

Bones grow from the middle out. Once the ends of a bone forms, the bone elongates by knitting together new bone tissue in the middle of the bone. This forces the already-formed ends to move outward as the bone elongates.

11. What is the difference between the axial and the appendicular skeleton?

The axial skeleton is the “center mass” of the body, and its parts come together at fixed or semi-movable joints. The appendicular skeleton (the limbs) is connected to the axial skeleton by way of semi-movable or movable joints. The difference is the type of joints contained in each, and the function of each. The axial skeleton can be thought of as the “core” of the body, while the appendicular made of the limbs. Worth noting - the axial skeleton houses the organs relating to the internal function of the individual (except the sense organs), while the appendicular skeleton seems to be made of the parts we use to interact with external things.

Muscular System KEY

Directions: Using the provided pages in your textbook to answer the following questions in complete sentences or fill in the blanks.

Structure (pp. 919, 921-922)

1. Skeletal muscles are made of strands called Muscle fibers.
2. Each one of those strands is made of protein filaments called myofibrils.
3. The thicker kind of protein filament is called myosin. The thinner kind is called actin.
4. The tough tissue that connects muscle to bone is a tendon.
5. Muscles require lots of energy. Therefore, muscle cells usually contain many of which organelle?
Mitochondria.

Function (pp. 918-919, 921-922)

6. Which kind of muscle tissue is activated when lifting a sack of flour? Skeletal muscle.
7. Which kind of muscle tissue helps move waste along the digestive tract? Smooth muscle.
8. How do muscles allow for movement of the body?

When muscles contract, they shorten. Because they are connected to the bone, when they shorten, they “pull the bone in a certain direction. When muscles relax, that “pull is undone, and the bone moves the other direction .

9. Why does strenuous activity cause oxygen debt? What is the result?

Large amounts of oxygen are needed to maintain the ATP production required for strenuous activity like sprinting or jumping. After several minutes of heavy exertion, the circulatory system can’t keep up with the demand, so the muscles become starved for oxygen. The result is a build up of lactic acid in muscle cells. Ouch!

10. Do muscles push? Do they pull? What do they do?

As discussed in #8, muscles do not push nor pull. They contract. This contraction causes the muscle to tense up and shorten, which “pulls” on the bones or it is connected to, resulting in movement.

11. Using the anatomy on p. 917 (and your own experience), list the muscles involved in a pushup. Why do we call this a “push” motion?

The main muscles involved are:

Pectoralis, triceps, deltoid, trapezius, and abdominal muscles.

The contracting of various muscles work together to straighten the arms and “push” the hands away from the body, while keeping the rest of the body in a good posture. That particular combination of contractions results in a pushing motion.

Cardiovascular System KEY

Directions: Using the provided charts and pages in your textbook to answer the following questions in complete sentences or fill in the blanks.

Structure (pp. 933, 936-937)

1. What is the main organ of the cardiovascular system? **The heart**
2. The second major component of the cardiovascular system are **blood vessels**.
3. **Arteries** are the blood vessels that carry blood *away* from the heart.
4. **Veins** are the blood vessels that carry blood *to* the heart.
5. **Capillaries** are the blood vessels whose walls are thin enough for gases and nutrients to diffuse across through the wall.

Function (pp. 940-941)

6. **Plasma** is the component of blood that carries nutrients and metabolites to cells.
7. Red blood cells are responsible for the transport of **oxygen** to all parts of the body.
8. **White Blood Cells** defend the body against disease by engulfing invading pathogens using phagocytosis.
9. Why must the blood pass through the pulmonary circuit before it is pumped to the body tissues?

The pulmonary circuit circulates the blood through the lungs where the blood is reoxygenated. The body tissues are then able to receive oxygen from the blood.

10. What regions of the body does the circulatory system affect?

The circulatory system affects all regions of the body because all cells are supplied oxygen via the blood. They also receive other nutrients and discard waste via the blood.

11. Could the body function without a functioning circulatory system? Describe what would happen in the body if the circulatory system did not fulfill its role.

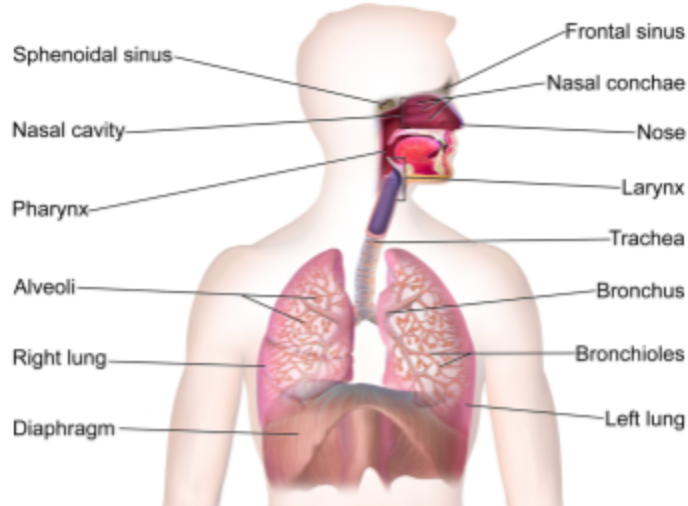
The body could not function without a functioning circulatory system. If the circulatory system did not fulfill its role then all tissues not exposed to air would die of oxygen starvation. Waste products would also accumulate in cells and cells would not receive all the necessary nutrients for growth.

Respiratory System KEY

Directions: Using the provided charts and pages in your textbook to answer the following questions in complete sentences or fill in the blanks.

Structure (pp. 946-947)

1. Label the missing structures



2. List the missing structures air passes through during inhalation.
 - I. Nose or mouth
 - II. Pharynx
 - III. Larynx
 - IV. **Trachea**
 - V. **Bronchus**
 - VI. Bronchiole
 - VII. **Alveolus**

Function (pp. 946-948)

3. Describe the differences between internal and external respiration.

Internal respiration is the exchange of gases that occurs between tissues and the blood while external respiration is a direct exchange of gases between tissues and the atmosphere. External respiration occurs in the lungs.

4. Why is the function of the respiratory system crucial to the function of the circulatory system?

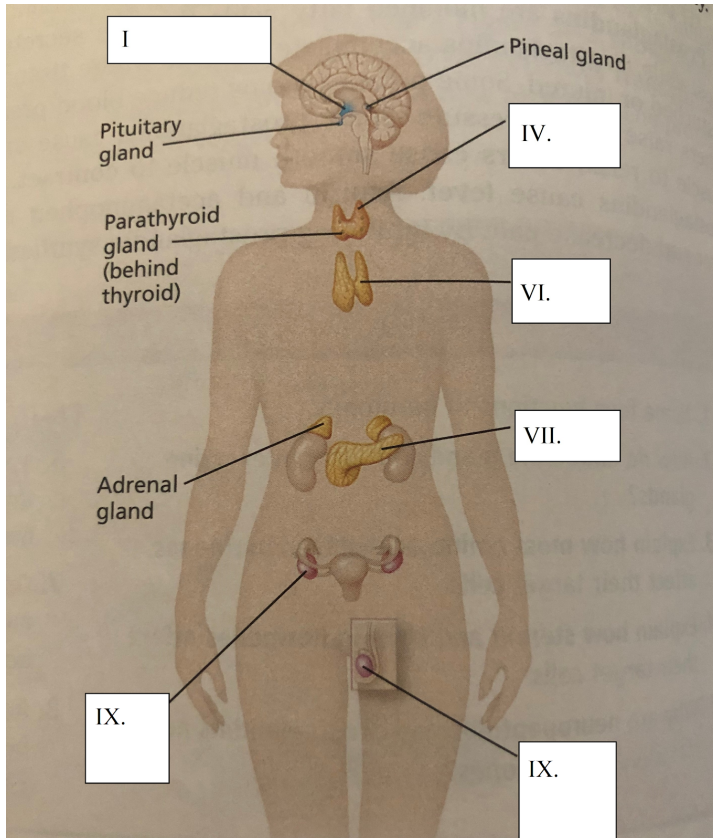
Without the function of the respiratory system, the blood of the circulatory system cannot be reoxygenated. One of the major functions of the circulatory system is to facilitate internal respiration so that internal cells can survive without direct contact with the atmosphere.

Endocrine System KEY

Directions: Using the provided charts and pages in your textbook to answer the following questions in complete sentences or fill in the blanks.

Structure (pp. 1034)

Label the missing structures of the endocrine system



- I. **Hypothalamus**
- II. Pineal gland
- III. Pituitary gland
- IV. **Thyroid gland**
- V. Parathyroid gland
- VI. **Thymus gland**
- VII. **Pancreas**
- VIII. Adrenal gland
- IX. **Ovaries (female)/
Testis (male)**

Function (pp. 1035-1039) - for the glands *provided* above, list the hormones they secrete, and the final cause of that hormone.

<i>Gland</i>	<i>Hormone(s)</i>	<i>Function of Hormone(s)</i>
Pineal gland	Melatonin	Regulates sleep patterns
Pituitary gland (choose four hormones)	<ol style="list-style-type: none"> 1. Antidiuretic hormone (ADH) 2. Growth Hormone (hGH) 3. Oxytocin 4. Thyroid-stimulating hormone (TSH) 	<ol style="list-style-type: none"> 1. Stimulates reabsorption of water by kidneys 2. Regulates development of muscles and bones 3. Stimulates estrogen and progesterone production 4. Regulates thyroid hormone secretion
Parathyroid gland	Parathyroid hormone	Increases blood calcium concentration
Adrenal gland (cortex and medulla)	<ol style="list-style-type: none"> 1. Aldosterone 2. Cortisol 	<ol style="list-style-type: none"> 1. Promotes salt and water retention 2. Promotes production of glucose from proteins

1. What is the difference between positive and negative feedback mechanisms (p.1041-1042)?

Negative feedback mechanisms inhibit the initial signal, slowing the secretion of particular hormones. Positive feedback mechanisms stimulate further hormone secretion. Both mechanisms share a final cause: to regulate and balance hormone secretions over time. They differ because one stops secretion, and does not.

2. Why might an overactive parathyroid gland cause bone problems?

The parathyroid gland regulates blood calcium levels. An overactive parathyroid would cause an excess of calcium in the blood. Since blood calcium is essential to bone development, abnormal calcium levels could affect bone development.

Reproductive System KEY

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Structure (pp. 1049-1051, 1052-1053)

List the organs of the human male reproductive system in order of their contact with a sperm cell.

19. Testis

20. Epididymis

21. Vas deferens

22. Seminal vesicle

23. Urethra

List the parts of the human female reproductive system in the order of their contact with an egg cell.

24. Ovaries

25. Fallopian Tubes

26. Uterus

27. (Cervix)

Function

28. The period of life before the reproductive system is functional is called childhood.

29. The period of life when the reproductive system is developing is called adolescence.

30. The period of life marked by a functional reproductive system is called adulthood.

31. What is the final cause of the human reproductive system?

The final cause of the human reproductive system is to produce human sex cells in preparation for sexual reproduction. Ultimately, more humans!

32. Is the reproductive system essential for survival?

While the reproductive system is essential for the survival of the species, it is NOT essential for the survival of the individual.

33. The reproductive organs produce a unique type of cell, different from all other cells. What are these cells called, and how are they different?

The reproductive system produces sex cells, or gametes. Gametes are different because: 1. They contain half the usual number of chromosomes, 2. They are unique to the sex of the organism that produces them (males produce sperm cells, females produce egg cells). 3. They can combine with gametes of the opposite sex to form a zygote.

34. What is the name of the process by which sex cells are produced?

Meiosis. Specifically, spermatogenesis and oogenesis.

35. Can a brother and sister be identical twins? If so, how? If not, why not?

No. Identical twins have identical DNA. If two organisms have identical DNA, they cannot be of different biological sexes.

36. Please read: Every other human system maintains the life of the human to which they belong. When that life comes to an end, so do the systems that supported it. The reproductive system is unique because it brings new lives into the world *that are ultimately capable of reproduction as well*. That is, the reproductive system brings about both new life and the potential for new life. This double significance means that human reproduction stretches out into the infinite future as generation after generation unfolds. Incredible!

Digestive System KEY

Directions: Using the provided pages in your textbook to answer the following questions in complete sentences or fill in the blanks.

Structure (pp. 985-991)

- Sort the following structures of the digestive system according to if they come into direct contact with food: mouth, liver, esophagus, stomach, pancreas, small intestine, large intestine, gallbladder

DIRECT CONTACT	NO DIRECT CONTACT
Mouth Esophagus Stomach Small Intestine Large Intestine	Liver Pancreas Gallbladder

- Using the structures listed in “direct contact” above, order them according to how food travels through the body:
 - Mouth
 - Esophagus
 - Stomach
 - Small Intestine
 - Large Intestine
- The **Cardiac Sphincter** is the upper boundary of the stomach and the **Pyloric Sphincter** is the point where the stomach connects to the small intestines.
- The liver produces bile which is then stored and concentrated in the **gallbladder**.
- The pancreas, because it secretes hormones and juices that help to neutralize stomach acid is a part of the **endocrine** system and the **digestive** system.

Function (pp. 985-991)

- Name and describe the two types of digestion that occur in the stomach.

Mechanical digestion is the physical compression of the stomach that helps to break apart food particles. Chemical digestion is the breakdown of food via chemical interactions between stomach acid and food particles.

- Explain how peristalsis moves food down the esophagus, into the stomach.

Peristalsis is the rhythmic contraction of muscles in the esophagus that pushes food from the top of the esophagus to the bottom where it enters the stomach.

- What is the primary function of the intestines? What structural feature of the small intestines allows it to perform its function well?

The primary function of the intestines is to absorb nutrients and water from digested material. The villi of the small intestine increase the surface area through which absorption can take place.

Body Systems Quiz

Multiple Choice - Write the correct letter on the provided line.

1. ____ The ribs shift in a limited range during the process of breathing. What type of joint connects individual rib bones to the sternum at the front of the chest?
 - a. Ball-and-socket joint
 - b. Fixed joint
 - c. Movable joint
 - d. Semimovable joint
2. ____ Which structure of the respiratory system is where the event of gas exchange takes place?
 - a. Trachea
 - b. Alveoli
 - c. Bronchioles
 - d. Diaphragm
3. ____ When you blush, muscles that control the width of your blood vessels relax and the diameter of blood vessels near the surface of your cheeks expands. What type of muscle is this example describing?
 - a. Cardiac
 - b. Skeletal
 - c. Smooth
 - d. Connective
4. ____ If you have difficulty sleeping, which gland of the endocrine system could be responsible?
 - a. Pineal
 - b. Pituitary
 - c. Parathyroid
 - d. Adrenal
5. ____ Baby food is blended to have a smooth texture. Which digestive function is this aiding?
 - a. Chemical digestion
 - b. Mechanical digestion
 - c. Peristalsis
 - d. Absorption
6. ____ To which body system would an organ that is responsible for regulating the start of a muscle development belong?
 - a. Muscular
 - b. Skeletal
 - c. Endocrine
 - d. Digestive
7. ____ What type of blood vessel would carry blood from your toes to your heart?
 - a. Artery
 - b. Vein
 - c. Capillary
 - d. Tendon

Fill in the Blanks

8. During strenuous activity, oxygen is depleted in the muscles because of _____ that occurs in the mitochondria.
9. The _____ of the small intestine increase its surface area to about the size of a tennis court.
10. _____ *slow* the secretion of hormones.
11. The respiratory system relies on the _____ system to move the rib cage.
12. External respiration occurs in the _____ because this is where the atmosphere directly exchanges gases with body tissues.
13. The immune system would not be able to destroy foreign pathogens if the blood did not contain _____.
14. New bone tissue is formed in the _____ region of the bone.

Short Answer - Answer in 3-5 complete sentences.

15. The tallest man ever known was 8 feet, 11 inches tall! He suffered from a disease of the endocrine system called gigantism. Which gland was malfunctioning and which hormone did he produce in disproportionate amounts? Did he produce too much or too little of this hormone? Explain your reasoning.

16. Acid reflux is the painful sensation that occurs when stomach acid enters the lower end of the esophagus. Which structure is malfunctioning and therefore causing the symptoms? Why do you not experience pain in your stomach constantly from the acid it contains? Explain your reasoning.