

Body Works
Title

12/12

Title Page

Body Works

Learning Targets

Learning Targets for Unit B: Body Works

Activity 12: What's Happening Inside?

- CONTENT: I can name and describe the function of the 8 main body systems.
- CONTENT: I can explain what an organ is, and the main functions of the organs within the body systems.
- SEP #2: I can create models of the body.

Activity 14: Breakdown

- CONTENT: I can explain the difference between mechanical and chemical breakdown, and the importance of both.
- SEP #3 & 4: I can design and do an experiment, collect data, and analyze it to answer a scientific question.

Activity 15: Digestion: An Absorbing Tale

- CONTENT: I can explain the parts of the digestive system, and their functions.
- SEP #8: I can critically read a scientific text to obtain information.

Activity 17: Gas Exchange

- SEP #3: I can conduct an investigation to find the difference between inhaled and exhaled air.
- CONTENT: I can describe and draw the anatomy of the lungs and where gas exchange occurs.

Activity 18: The Circulation Game

- SEP #2 & CONTENT: I can model and explain how blood flows through the body to transport and exchange gases, nutrients, and wastes.

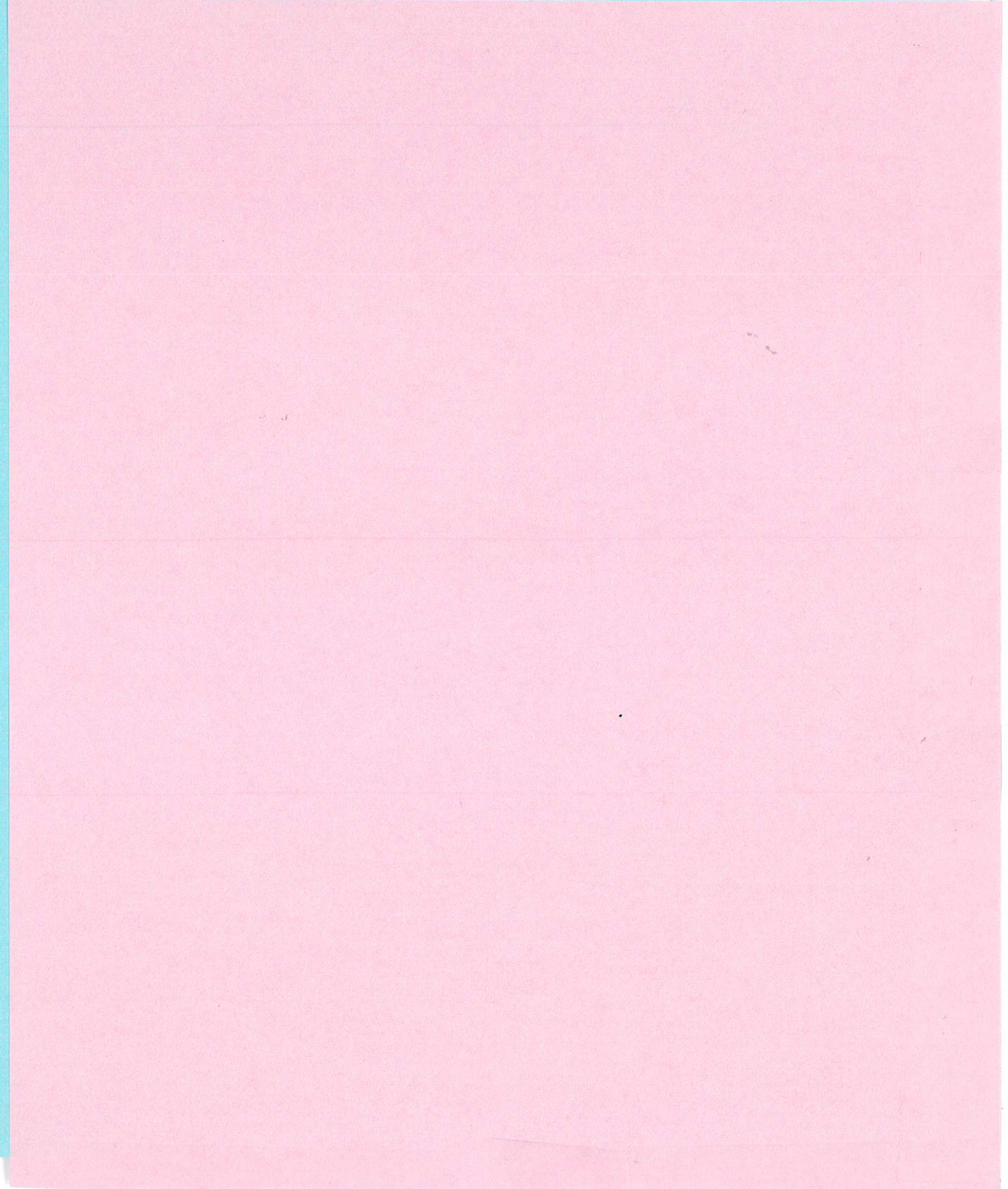
Activity 22: The Heart: A Muscle

- SEP #3: I can measure how hard my heart works.
- SEP #2: I can analyze the pros and cons of a model.

Activity 23: Heart Parts

- CONTENT: I can explain how the heart works as a double pump.
- SEP #8: I can critically read a scientific text to obtain information.

ACTIVITY	Date	Page 45
Body Works	12/12	
Paper Pocket		



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Warm up

List as many organs as you can think of in 1 minute.

- Stomach - small intestines
- Lungs - Liver
- Heart - pancreas
- large intestine - gall bladder
- Kidney - skin - Brain
- Appendix - bladder - Genitals

Warm up

What does each body system do?

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Muscular system

Helps the body...

Nervous system

Excretory system

Respiratory system

Cardiovascular system

Reproductive system

Skeletal system

P.B 13

Name _____

Date _____

Act 12: Functions of Human Body Systems pg 1

Function	Organ	System
These begin the process of mechanical digestion.	teeth	digestive
These remove wastes from the blood and transfer them into urine.	kidneys	excretory
Nutrients are absorbed from food and go into the blood here.	small intestine	digestive
This holds solid waste before it is expelled from the body.	rectum	digestive/excretory
This produces chemicals, such as digestive enzymes, that help digest food.	pancreas	digestive
This tube connects the throat and nose to the bronchial tubes.	trachea	respiratory
These are the tiny sacs where the exchange of oxygen and carbon dioxide takes place.	alveoli	respiratory
Eggs develop in these.	ovaries	reproductive
A fertilized egg grows here.	uterus	reproductive
This signals the body to react to changes in the environment, such as danger or the smell of food.	brain	nervous
These sense the outside world and communicate with the rest of the body's systems.	nerves	nervous
This protects the lungs and supports breathing.	rib cage	skeletal
This holds urine before it is released from the body.	bladder	excretory
Semen passes through these tubes from the testes to the urethra.	vas deferens	reproductive
This pump works every minute of life.	heart	cardiovascular
These blood vessels carry blood toward the heart.	veins	cardiovascular
This moves food from the mouth into the stomach.	esophagus	digestive
This stretchy muscular sac holds food.	stomach	digestive

Name _____

Date _____

Functions of Human Body Systems (continued)

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Function	Organ	System
This stretchy muscular sac holds food.		
Urine is eliminated from the body through this tube.	urethra	excretory
This absorbs water from food, stores wastes, and eventually eliminates wastes from the body.	large intestine	digestive
This produces bile, which helps digest fats, breaks down toxins, and regulates cholesterol and sugar in the blood.	liver	digestive excretory
Sperm exit the body here.	penis	reproductive excretory
These contract to help the body to move.	skeletal muscles	muscular
Air enters the body here.	nose mouth	respiratory
Air passes through these just before it reaches the lungs.	bronchial tubes	respiratory
These are where oxygen is exchanged between the blood and circulatory system. These expand during inhalation and contract during exhalation.	lungs	respiratory excretory
Sperm are produced here.	testes	reproductive
In one of these tubes between the ovaries and uterus an egg is fertilized.	fallopian tubes	reprod
This is a bundle of nerves that connects your brain to all the rest of your body.	spinal cord	nervous
This is a tube-shaped passage from the uterus to the outside of the body.	vagina	reprod.
These provide support for the body and are where blood cells are produced.	long bones	skeletal
These protect the spinal cord and support the head and back.	spinal column	skeletal
These are tubes that urine passes through from the kidneys to the bladder.	ureters	excretory
These blood vessels carry blood away from the heart.	arteries	cardiovascular
In these tiniest blood vessels blood and organs exchange nutrients and waste.	capillaries	CV; Resp; Dig!

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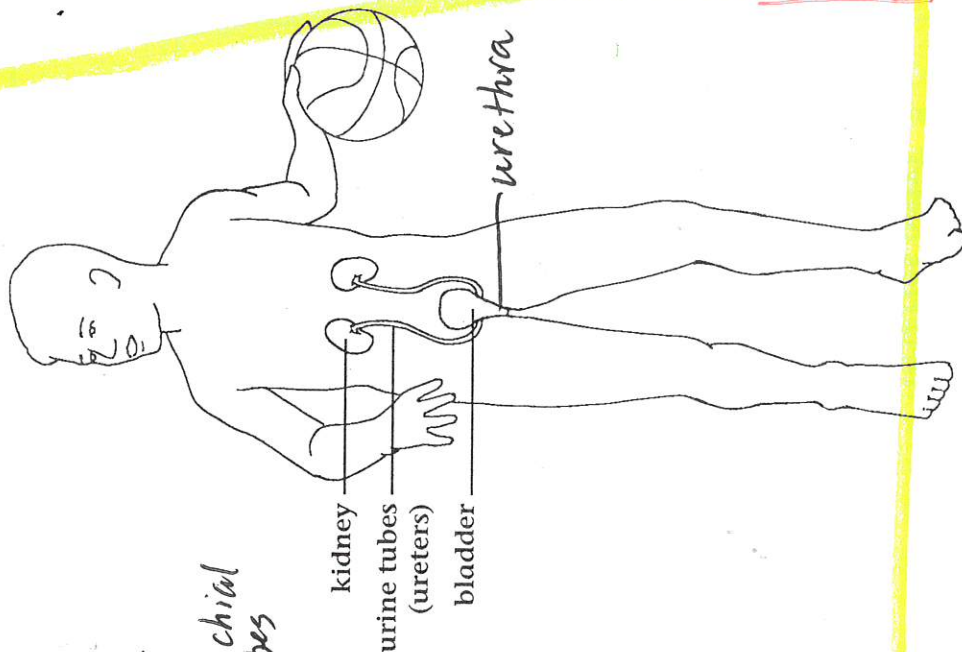
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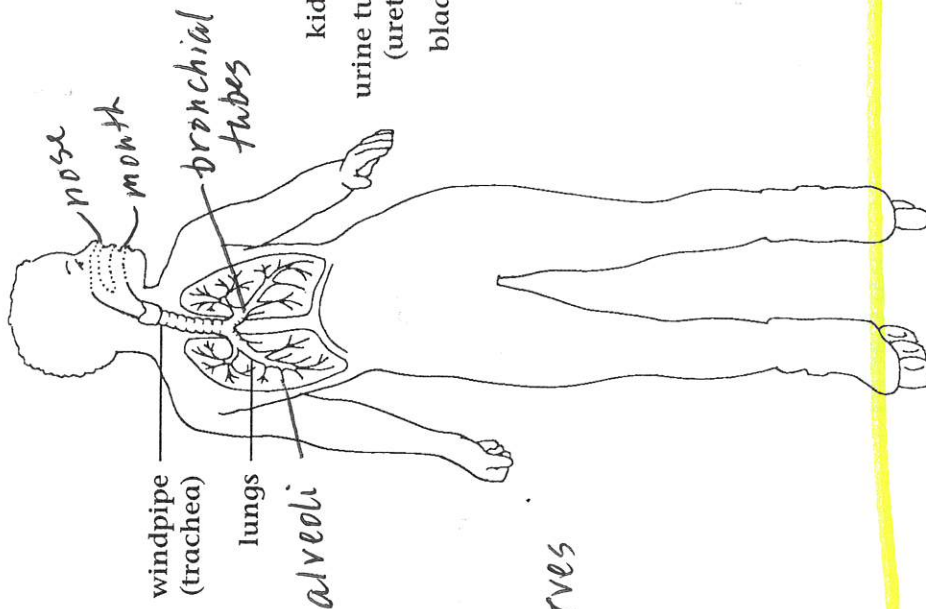
Name _____

Human Body Systems - Act 12

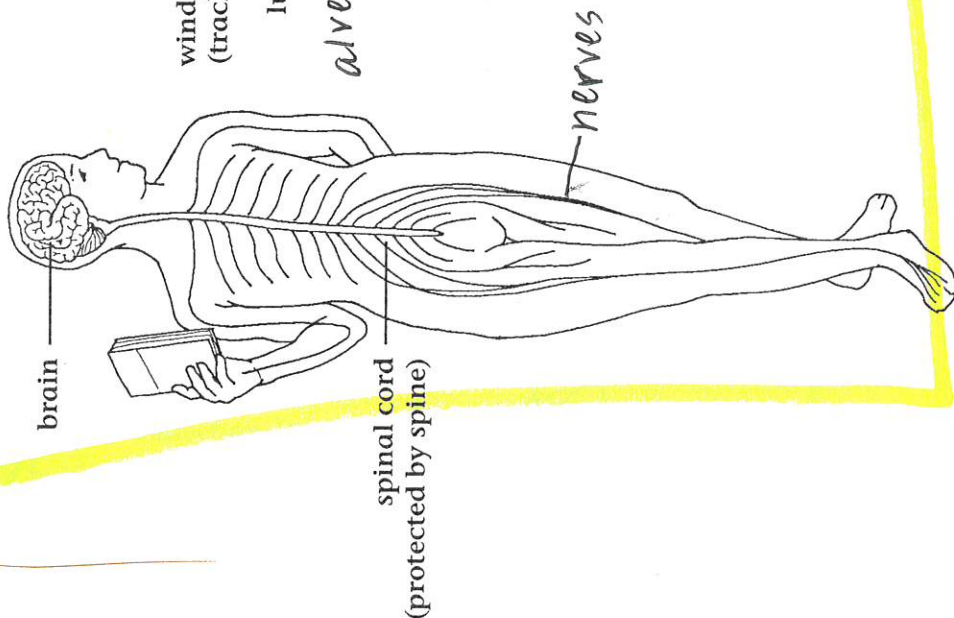
Excretory



Respiratory



Nervous

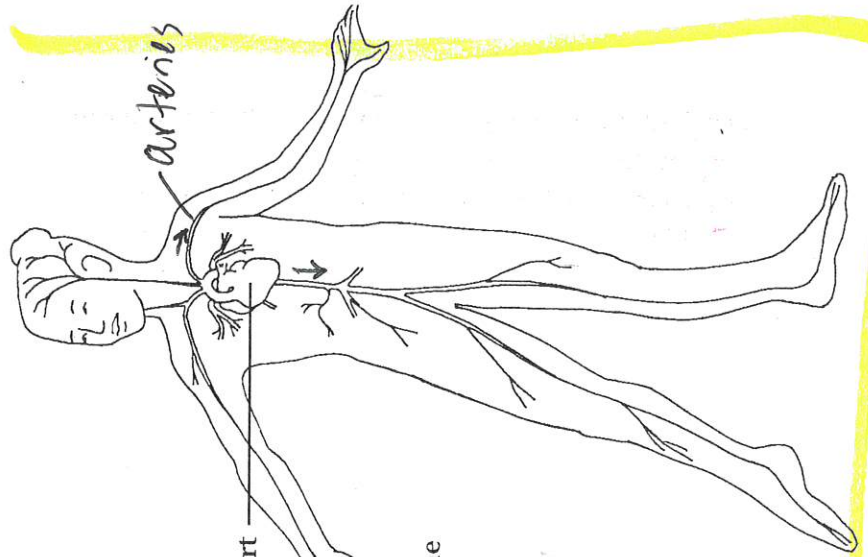


Name

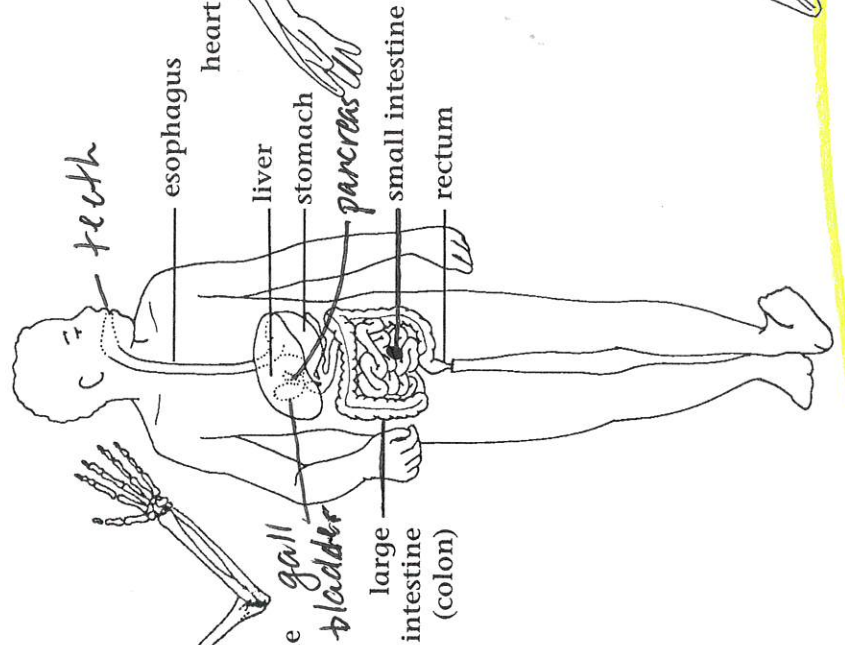
Date

Human Body Systems (cont.)

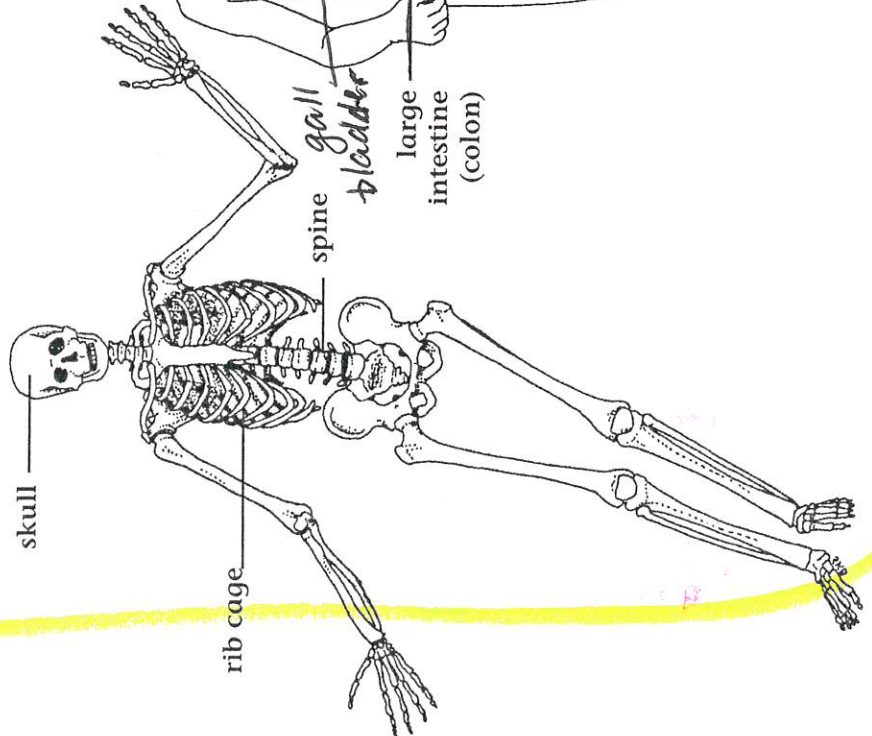
Circulatory (arteries only)



Digestive



Skeletal



Name

Human Body Systems - Act 12

Name:

Activity 12: What's Happening Inside? Body System Information

Excretory System

This system filters out wastes and purifies the blood. It also is responsible for eliminating those wastes from the body. The body's water balance is maintained by this system.

• Lungs get rid of CO_2

Muscular System

This system allows movement. Its organs are found in practically every part of the body. This is the only system that has organs that can contract. The largest body system by mass, it makes up approximately 40% of a person's body weight.

Respiratory System

This system is responsible for gas exchange between the body and the surrounding air. As air enters the body, its oxygen travels through the many organs of this system until eventually the oxygen is diffused into the blood. This system also releases carbon dioxide from the blood into the air during exhalation.

Reproductive System

This system allows continuation of our species. The organs are different in males and females. The different organs produce different types of cells. If the cell produced by a male fertilizes the cell produced by a female, the fertilized cell can develop into a new human.

Name _____

Date _____

Act 12: Functions of Human Body Systems pg 1**PURPLE****Nervous System**

This is the master system that senses the outside world, controls the body, and allows communication among all of the other systems. Every thought, action, and emotion a person has requires activity in this system. It is the fastest acting and most complex system of the body. The cells in this system can communicate at speeds up to 200 miles per hour!

Skeletal System

This system provides support and shape. It also protects delicate organs within the body. Organs of this system are attached to muscles and often act as levers allowing movement. They range in size from 0.1 inch (0.3 cm) to 18 inches (45.7 cm)! Minerals are stored here and red blood cells are produced within this system.

GREEN**Digestive System**

This system transforms food to energy. Food enters the body, goes through many organs of this system while other nearby organs secrete chemicals. Finally food is transformed into nutrients that the body can use and wastes which are eliminated from your body.

heart circulatory
↓ ↓
vessels

Cardiovascular System

This system transports nutrients and wastes through the body. It includes a pump that pumps blood. The blood picks up oxygen from the lungs and nutrients from the small intestines and delivers them to the body's cells. This enables the cells to create energy. The blood also picks up wastes from the cells and delivers them to the excretory and respiratory systems so they can be removed from the body.

This stretchy muscular sac holds food.

Stomach

digestive

Rules

- R&IA
- Full Sentences
- skip lines!

Analysis Questions (H 1, 4, 7)

1. Look at the drawing that you made in Part A. List some structures or organs that were not the right shape or size or were in the wrong place on your original drawing. Explain how you would change them if you could redraw the diagram.
2. Look at the questions that you recorded in your science notebook after Part A. Answer all of the questions that you can answer. Discuss with your group any that you are still not sure about.
3. The liver is the largest internal organ of the human body. Was the liver the largest organ in your clay model? Do you think that the other organs you modeled in the clay were accurate in size? Why or why not?
4. What are some of the limitations of the clay model you made of the human body in Part C?
5. Prepare a table with headings as shown below. Fill in the first column with the organs or structures listed in Table 1.

Organs and Structures	System	Function

- a. In the second column of your table, identify the system that matches each organ or structure. For example, the stomach is a part of the digestive system.
- b. In the third column of your table, identify the function of each of the systems you mentioned in 5a.
6. Imagine a younger student did not understand the difference between the body's organs and systems. Explain the relationship in a way that a younger student could understand.
7. Reflection: What new things have you learned about the human body in this activity?

Warm up

List all organs that are part of the digestive system.

Digestive system

- esophagus
- stomach
- capillaries
- teeth
- rectum
- pancreas
- Liver
- Large intestine
- small intestine
- stomach



Question:

Why do we chew food before swallowing?

Hypothesis:

If the antacid pill is broken into half, quarters, and eighths, then the _____ will dissolve the fastest, because... _____

Data Table

Size of pill	Time to dissolve (s)
Y8:	49.58

Procedure:

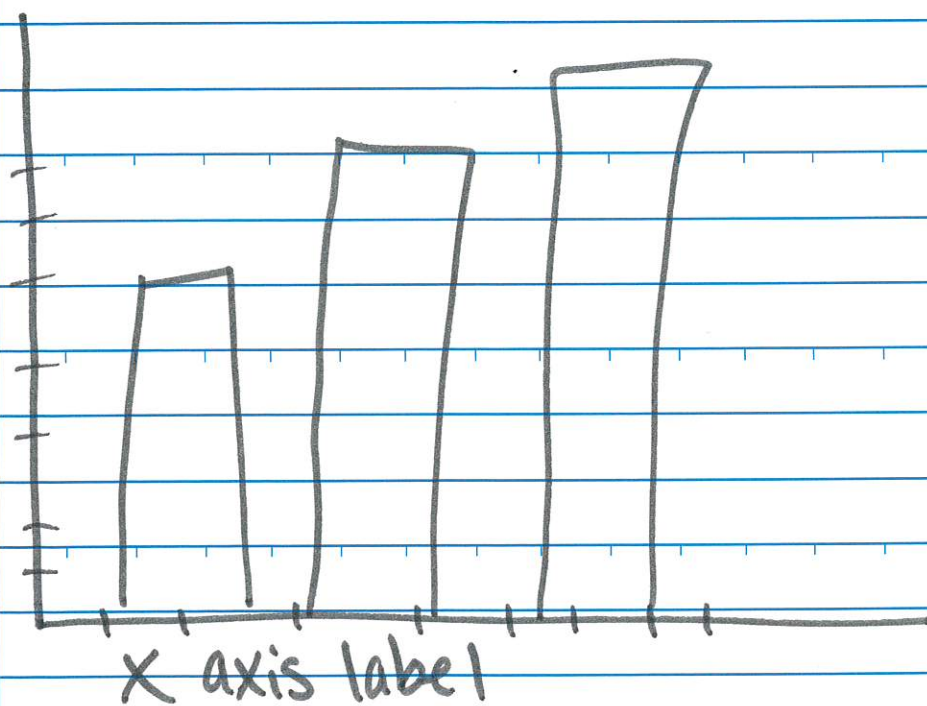
1.

2.

Activity #	Name:		How well I understand before the lesson (1-6)	Questions related to learning target(s)	How well I understand after the lesson (1-6)
	Learning Targets				
• Content: I can distinguish between Lamarck's					

Graph

y axis label



pink

An Absorbing Tale

Warm upchemical break down = stomach acid
breaking down foodmechanical break down = teeth
chewing food

Name:

Answer Key

Activity 15: Digestion: An Absorbing Tale

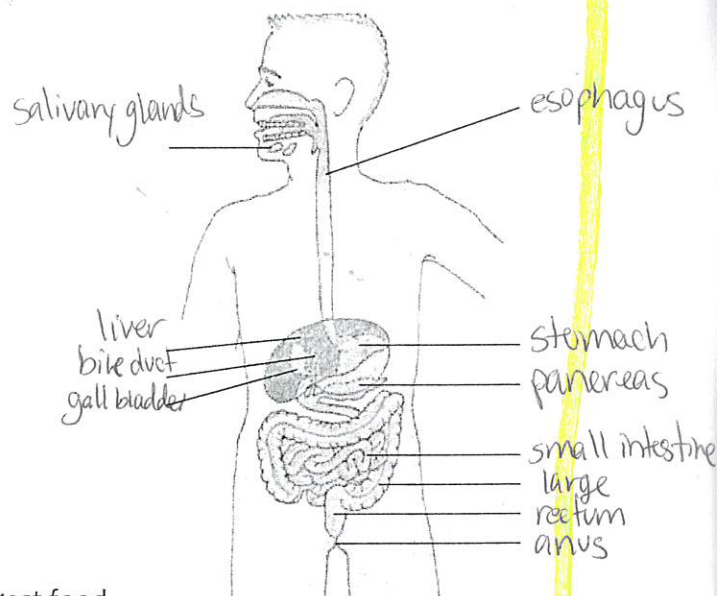
Period:

READING OUTLINE

1. Go back to the introduction from Activity 14. Define the difference between **mechanical** and **chemical breakdown** of food, AND explain **where** each type of breakdown occurs.

Mechanical breakdown breaks apart food into small pieces with help from your teeth and tongue. Chemical breakdown uses chemicals to break down food even smaller in your mouth, stomach, and intestines.

2. Label the parts of the digestive system on the diagram to the right.



3. Explain how food moves from the mouth to the stomach.

Food travels from your mouth through the esophagus when you swallow. Your esophagus muscles contract to help food move towards your stomach.

4. Explain how the stomach works to help digest food.

Muscles in your stomach help mix the contents. Also, acid in your stomach chemically breaks down food.

5. How does your stomach protect itself, and what happens if it can't?

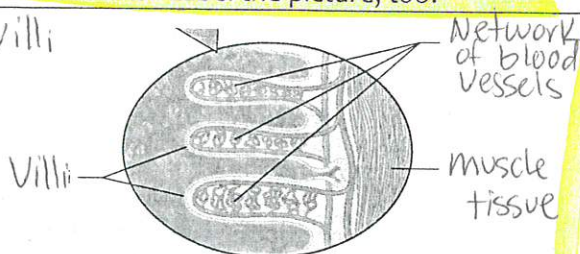
Your stomach is lined with mucus to protect itself from acid. When the lining is gone, ulcers can form.

6. chemicals from the pancreas and bile from the liver help break down proteins and fat.

7. Once food is broken down completely into **nutrients**, the nutrients move from the small intestine into the blood which moves those nutrients all around the body.

8. Explain how villi in your intestine work to absorb nutrients. Label the picture, too.

Nutrients must pass through villi and the walls of tiny blood vessels to enter the blood.



9. What functions do the following organs have for digestion?

Liver (the <u>first</u> place blood goes after the intestines)	Kidneys
<ul style="list-style-type: none"> • breaks down toxins & medicines • processes nutrients into easier forms to use 	<ul style="list-style-type: none"> • filters your blood • excretes urine

10. Nearing the end (literally). What two things are absorbed in the colon (another name for the large intestine)?

Water and vitamins

11. What happens to the leftover unabsorbed materials in the large intestine?

It forms a solid waste product that travels through the large intestine. It is temporarily stored in the rectum.

12. What are the pros and cons of having trillions of bacteria live in your colon?

Pros	Cons (trade-offs)
<ul style="list-style-type: none"> • break down plant material • produces vitamin K • prevents bacteria (harmful) 	<ul style="list-style-type: none"> • gas & odors they produce

AQ #2: Complete the table below:

Functions of Digestive Organs

Organ (or structure)	Mechanical breakdown	Chemical breakdown	Nutrient absorption	Water absorption and solid waste production
Mouth	X	X		
Stomach	X	X		
Small intestine		X	X	
Pancreas		X		
Liver			X	
Large intestine		X	X	X

Warm up

What happened to my friend Molly?
Use terms from the reading.

When Molly ate too much cheese...
she had an ulcer because the
stomach lining was thin and
the acid hurts the stomach wall.

Data table:

Name	# of drops of sodium hydroxide
Ezra	
Mr. Groom	
Ms. Watkins	

AQ 2c-4, 6a and b

2c.

3.

4.

6a.

6b.

Lungs need to absorb oxygen to send to your heart.

Tale
LINE

Name _____

Date

1/6

Anticipation Guide: Gas Exchange

Before starting the activity, mark whether you agree (+) or disagree (—) with each statement below.

After completing the activity, mark whether you agree (+) or disagree (—) with each statement below. Under each statement, explain how the activity gave evidence to support or change your ideas.

Before After

— + 1. Carbon dioxide is produced when your body chemically breaks down substances in food.

This is true because...

— — 2. All of the air that you exhale is carbon dioxide.

Oxygen, nitrogen, water vapor & CO₂ are all exhaled

— + 3. Your body needs oxygen to get energy from food.

Our bodies need oxygen...

— + 4. The amount of carbon dioxide that you exhale is different than the amount exhaled by other people.

Everyone has a different size of lungs.

— — 5. The air we breathe is pure oxygen.

The air we breathe is made up of oxygen, CO₂, nitrogen, water vapor, & argon.

— — 6. Your lungs are sacs with smooth walls, similar to the walls of a balloon.

your lungs are bumpy with alveoli.

— — 7. Air and food go down the same passageway.

Air goes down the trachea and food goes down the esophagus.

— + 8. The walls of your lungs are filled with many tiny blood vessels.

Lungs need to absorb oxygen to send to your heart.

Warm up

What happened to my friend Molly?

Analysis Questions Guide

Sentence Starters for AQ:

2 c	The air that you breath in is made up mostly of _____, while the air that you breath out is made up mostly of _____.
3	The range of carbon dioxide in exhaled breath as measured by drops of sodium hydroxide is _____ to _____.
4	The inside of the lung is structured like _____ because _____.
6 a	One important structure in the respiratory system is _____. Another important structure in the respiratory system is _____.
6 b	Gasses are exchanged within the respiratory system in _____.

Extension for AQ:

How do you think your body gets more oxygen when you exercise? Do you breathe faster (take more breaths per minute)? Or do you absorb more oxygen from the air with each breath? Use what you learned in this activity to develop an experiment to test your hypothesis?

6b.

Lungs need to absorb oxygen to send to your heart.

Summary of pages — to —

Name: _____

FRIDAY NOTEBOOK REVIEW # 4

Period: _____ Date: _____

Learning Summary of Last Week: Notebook Pages _____ to _____ (Activities _____ to _____)

Something that was interesting from this week,
and **why** did you find it interesting:

Draw a diagram that will help you
remember something from this week:

Question(s) that I have related to the topics learned: (you must come up with something!)

1/10

Study guide Body Works

STUDY GUIDE UNIT B: BODY WORKS

Name:

Activity	Learning Targets	Questions You Should Be Able to Answer	Key Vocabulary
12: What's Happening Inside?	<p><u>CONTENT:</u> I can name and describe the function of the 8 main body systems.</p> <p><u>CONTENT:</u> I can explain what an organ is, and the main functions of the organs within the body systems.</p> <p><u>SEP #2:</u> I can create models of the body.</p>	<ul style="list-style-type: none"> What are the 8 body (organ) systems? What is the function of each body system? What are the main organs of each body system? 	Body system Organ Digestive Excretory Respiratory Nervous Skeletal Reproductive Cardiovascular
14: Breakdown	<p><u>CONTENT:</u> I can explain the difference between mechanical and chemical breakdown, and the importance of both.</p> <p><u>SEP #3 & 4:</u> I can design and do an experiment, collect data, and analyze it to answer a scientific question.</p>	<ul style="list-style-type: none"> Why are mechanical and chemical breakdown both important parts of digestion? 	Mechanical breakdown Chemical breakdown
15: Digestion: An Absorbing Tale	<p><u>CONTENT:</u> I can explain the parts of the digestive system, and their functions.</p> <p><u>SEP #8:</u> I can critically read a scientific text to obtain information.</p>	<ul style="list-style-type: none"> What is the purpose of the digestive system? What are the main organs of the digestive system, and what do they do? What are all the stages of digestion from eating to excreting waste? 	Nutrients Absorption Stomach Esophagus Small intestine Large intestine Liver Pancreas

ACTIVITY Study Guide (cont)	Date 4/10	Page 56

19 Heart
ily
fit

17: Gas Exchange	<p>SEP #3: I can conduct an investigation to find the difference between inhaled and exhaled air.</p> <p>CONTENT: I can describe and draw the anatomy of the lungs and where gas exchange occurs.</p>	<ul style="list-style-type: none"> How are inhaled air and exhaled air different? How does an indicator work? What is the difference between cellular respiration and the respiratory system? 	<p>Indicator</p> <p>Respiratory system</p> <p>Respiration</p> <p>Exhaled vs. inhaled</p>
18: The Circulation Game	<p>SEP #2 & CONTENT: I can model and explain how blood flows through the body to transport and exchange gases, nutrients, and wastes.</p>	<ul style="list-style-type: none"> What is the function of the cardiovascular system? How do the heart, arteries, veins, and capillaries work together? How are wastes and nutrients transported through the body? 	<p>Cardiovascular system</p> <p>Arteries</p> <p>Veins</p> <p>Capillaries</p>
22: The Heart: A Muscle	<p>SEP #3: I can measure how hard my heart works.</p> <p>SEP #2: I can analyze the pros and cons of a model.</p>	<ul style="list-style-type: none"> How can you measure how hard your heart muscle works? 	<p>Volume</p> <p>Heart rate</p> <p>Pulse</p>
23: Heart Parts	<p>CONTENT: I can explain how the heart works as a double pump.</p> <p>SEP #8: I can critically read a scientific text to obtain information.</p>	<ul style="list-style-type: none"> How does the heart work (left vs. right?) What pathway does blood take through atria and ventricles? Where can you find oxygenated and deoxygenated blood? 	<p>Valves</p> <p>Atrium</p> <p>Ventricle</p> <p>Blood vessels</p> <p>Arteries</p> <p>Veins</p> <p>Capillaries</p>

Name

Name

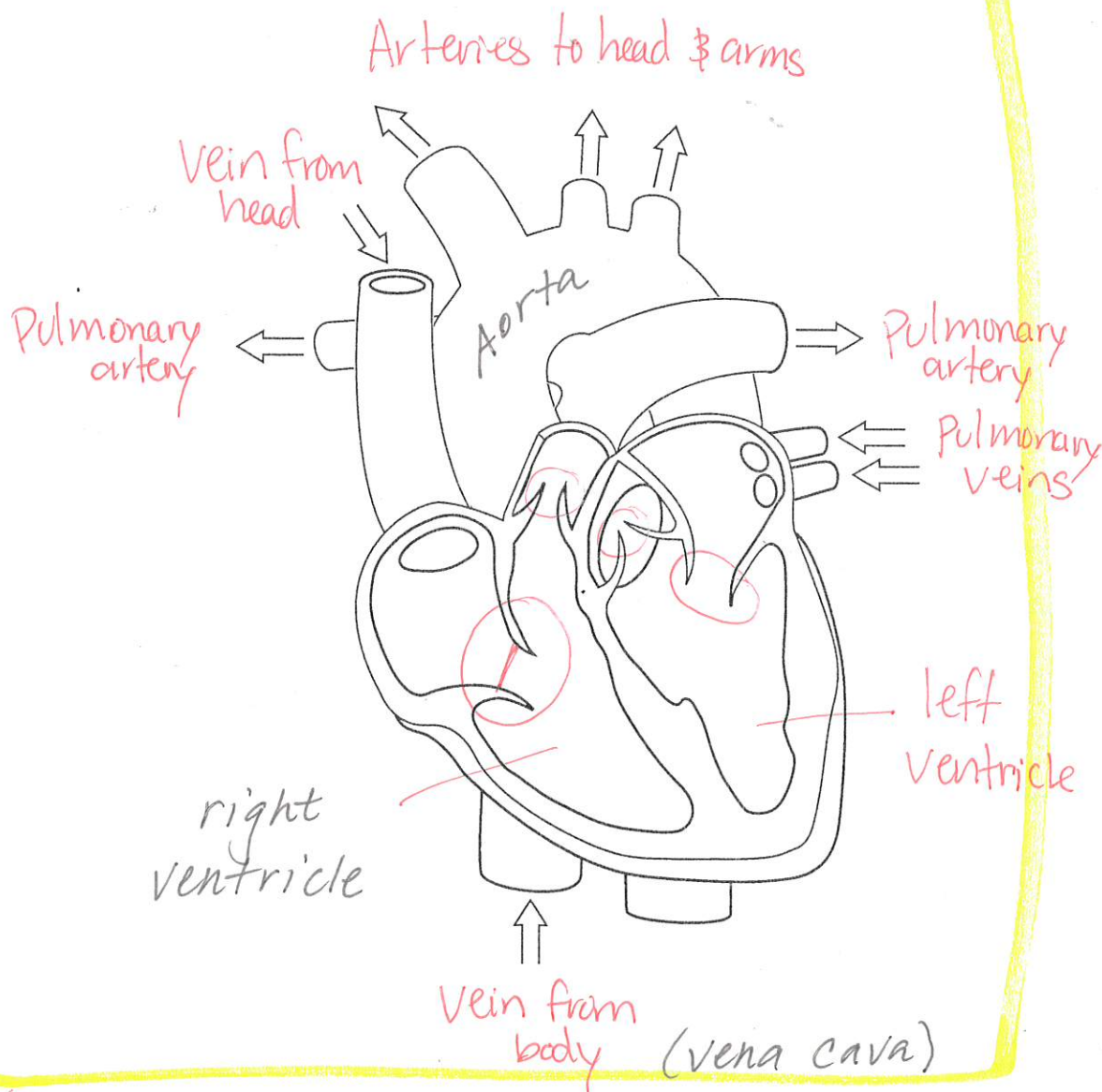
Date

1/14/20

Heart Diagram

Right

Left



CO₂

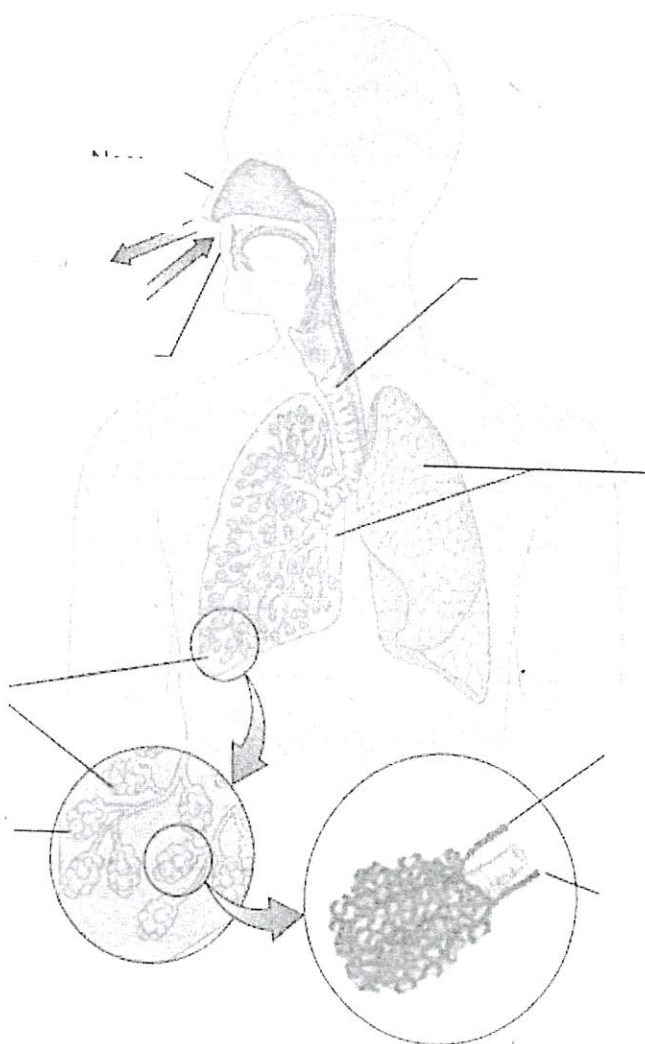
Name: _____

Activity 17: Gas Exchange

Period _____

Parts of Respiratory System

Label the parts of the respiratory system on the diagram below.



Warm up:

What increases your heart rate?

When I _____ my heart rate gets faster.

- run
- playing infection
- scared
- excited
- sugar
- bleeding

ACTIVITY	Act 19: Heart-ily Fit	Date	1/16	Page 59
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Warm up:

Name _____

Date _____

Pulse Data

I. Calculating My Resting Pulse

	15-Second Pulse		60-Second Pulse
Trial 1	19	x 4 =	76
Trial 2	20	x 4 =	80
Trial 3	_____	x 4 =	_____

II. My Average Resting Pulse: _____ beats per minute

- Add the 3 numbers in the column titled "60-Second Pulse": _____
- Divide the total from (a) by 3: _____
This number is your average resting pulse per minute.

III. Recovery Time

	15-Second Pulse		60-Second Pulse
Immediately	_____	x 4 =	_____
After 30 seconds	_____	x 4 =	_____
After 1 minute	_____	x 4 =	_____
After 30 more seconds	_____	x 4 =	_____
After 2 minutes	_____	x 4 =	_____
After 30 more seconds	_____	x 4 =	_____
After 3 minutes	_____	x 4 =	_____
After 30 more seconds	_____	x 4 =	_____
After 4 minutes	_____	x 4 =	_____
After 30 more seconds	_____	x 4 =	_____
After 5 minutes	_____	x 4 =	_____