

# Teacher Workbooks

Science and Nature Series



Chemistry



$$E=mc^2$$



Biology

Digestive, Circulatory, and  
Respiratory Systems - Volume 1

Teachnology Publishing Company

# Teacher workbooks

Science and Nature Series  
Digestive, Circulatory, and  
Respiratory Systems, Vol. 1

© Copyright 2004  
Technology Publishing Company  
A Division of Technology, Inc.

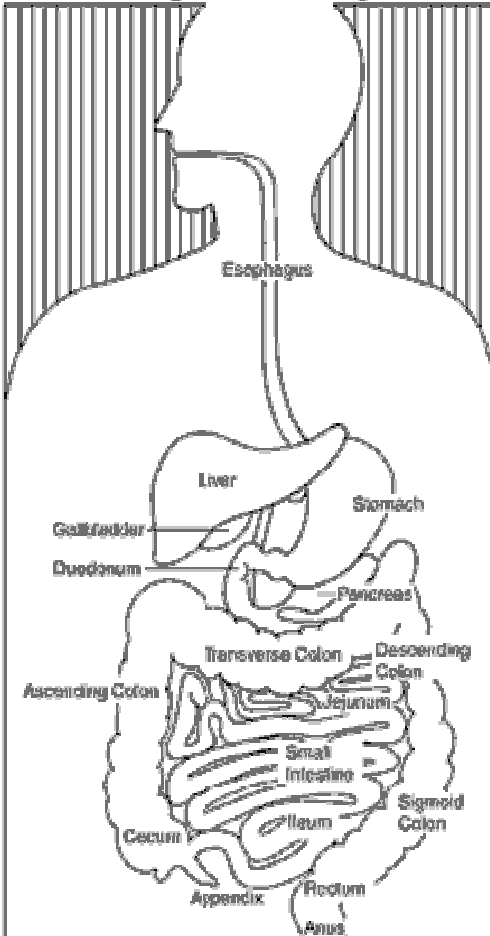
For additional information, visit us at [www.technologypublishing.com](http://www.technologypublishing.com)

# Table of Contents

<b>Digestive System</b>	
Class Notes-Digestion in Humans.....	1-2
Digestive System Vocabulary.....	3
Digestive System Cryptogram.....	4
Digestion Graphic Organizer.....	5
Digestive Word Search.....	6
Digestive System Crossword.....	7
Digestive System Quiz.....	8
Digestive System Travel Brochure Project.....	9
Digestive System Square Puzzle.....	10
<b>Circulatory System</b>	
Class Notes-Circulatory System.....	11-13
Circulatory System Vocabulary.....	14
Circulatory System Cryptogram.....	15
Circulatory Graphic Organizer.....	16
Circulatory Word Search.....	17
Circulatory System Crossword.....	18
Circulatory System Quiz.....	19
Circulatory System Matching Quiz.....	20
The Cardiac 100 Project.....	21
<b>Human Respiratory System:</b>	
Class Notes-Human Respiration.....	22
Respiratory System Vocabulary.....	23
Respiratory System Cryptogram.....	24
Respiratory Word Search.....	25
Respiratory System Crossword.....	26
The Oxygen Treasure Map Project.....	27
Respiratory Matching Quiz.....	28
The Diaphragm in Action!.....	29
<b>Answers.....</b>	<b>30</b>

## Digestion in Humans

### The Digestive System



Digestion begins in the mouth. Teeth break down food mechanically. **Amylase** is an enzyme found in the mouth that breaks down starch.

The **epiglottis** covers the trachea (windpipe) allowing food to freely flow to the esophagus followed by the stomach.

Food is pushed through the digestive canal by tiny contracting smooth muscle tissue. This process is called **peristalsis**.

### The Stomach

Food sits in the stomach for two hours. During this time, food is broken down by **gastric juices** secreted by the stomach wall. Gastric juice is composed of **hydrochloric acid (HCl)** and the enzyme **pepsin**. Pepsin breaks down proteins into shorter polypeptide chains.

### The Small Intestine

The interior surface of the small intestine contains a number of finger-like projections called **villi**. **Villi** increase the surface area for absorbing broken down food products. The small intestine absorbs food, minerals, and a small amount of water.

### Pancreas

The pancreas produces enzymes that directly or indirectly breakdown food. The pancreas is also the organ in charge of making insulin. Insulin is a hormone that regulates the amount sugar that enters the blood.

## Liver, Gallbladder, and Large Intestine

The liver produces **bile**. Bile is a liquid that digests large fat particles. Bile is stored in **gall bladder**. The gall bladder is a small sac at the base of the liver. During the digestive process, the gall bladder releases bile into the small intestine to break down fat particles. The **large intestine** is where the last bit of digestion takes place. Food residues are stored and a large amount of water is reabsorbed into the body in the large intestine.

### Digestive disorders:

<b>Appendicitis</b>	An inflammation of the appendix.
<b>Constipation</b>	Caused due to lack of water in the intestines. Creates a condition that makes it difficult to eliminate feces.
<b>Diarrhea</b>	Caused due to the presence of additional water in the intestines. The feces can become very watery. Prolonged diarrhea can cause dehydration and require medical attention quickly.
<b>Gallstones</b>	Small cholesterol deposits that form in the gallbladder. When gallstones can be secreted into the bile duct. When this happens, they block the flow of bile causing severe pain.
<b>Ulcers</b>	Small pores or openings in the lining of the stomach. Caused due to the presence of excessive acid or bacteria in the stomach. Ulcers are painful and cause internal bleeding.

Name \_\_\_\_\_

Date \_\_\_\_\_

## Digestive System Definitions

<b>Amylase</b>	
<b>Epiglottis</b>	
<b>Peristalsis</b>	
<b>Gastric Juices</b>	
<b>Pepsin</b>	
<b>Villi</b>	
<b>Bile</b>	
<b>Appendicitis</b>	
<b>Constipation</b>	
<b>Diarrhea</b>	
<b>Gallstones</b>	
<b>Ulcers</b>	

# Digestive Cryptogram

**Riddle:** How many pounds of food does the average human eat in a year?

driheaar



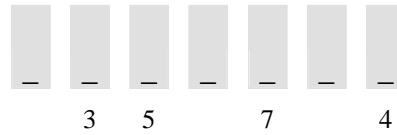
livil



eilvr



aomshtc



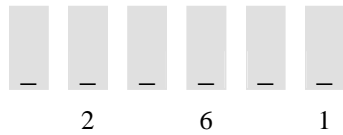
lieb



cerlus



pspein



ioasitponct



peisdtpinaci



olsstgeanl



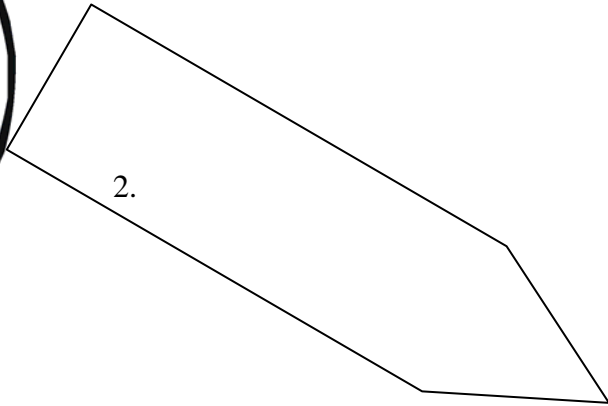
**ANSWER:**



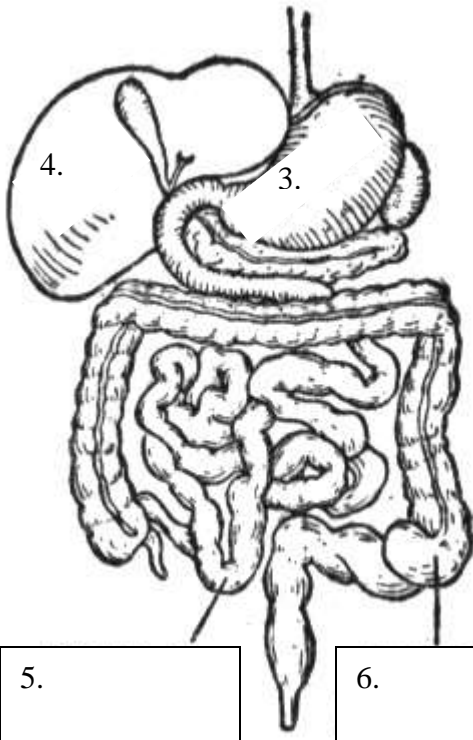
# Digestion Graphic Organizer



1.



2.

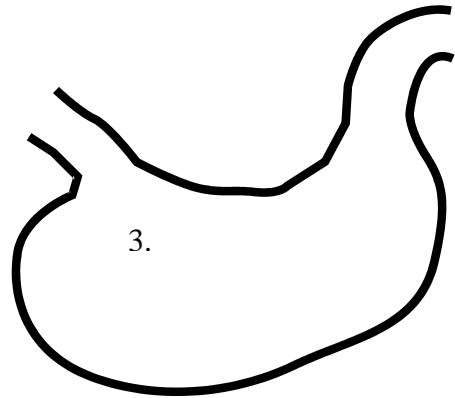


4.

3.

5.

6.



3.



## Digestive Word Search

M F S B C H X Q R J Z O  
D G O R H J T B D T L C  
C A P E P S I N O O J K  
D L G B B F T H Y U J F  
I L S Z I X B Y L E N D  
A S M X L X N A Q Z C T  
R T N Q E C Y V I L L I  
R O X D P A N C R E A S  
H N E A M Y L A S E Q K  
E E D L U I D U F E T R  
A S J H S R E C L U V V  
E P E R I S T A L S I S

Clue 1 - **An enzyme found in the mouth that breaks down starch.**

Clue 2 - **The movement of food through the digestive system.**

Clue 3 - **Breaks down proteins into shorter polypeptide chains.**

Clue 4 - **Increases the surface area for absorbing broken down food products in the small intestine.**

Clue 5 - **The organ in charge of making insulin.**

Clue 6 - **A liquid that digests large fat particles.**

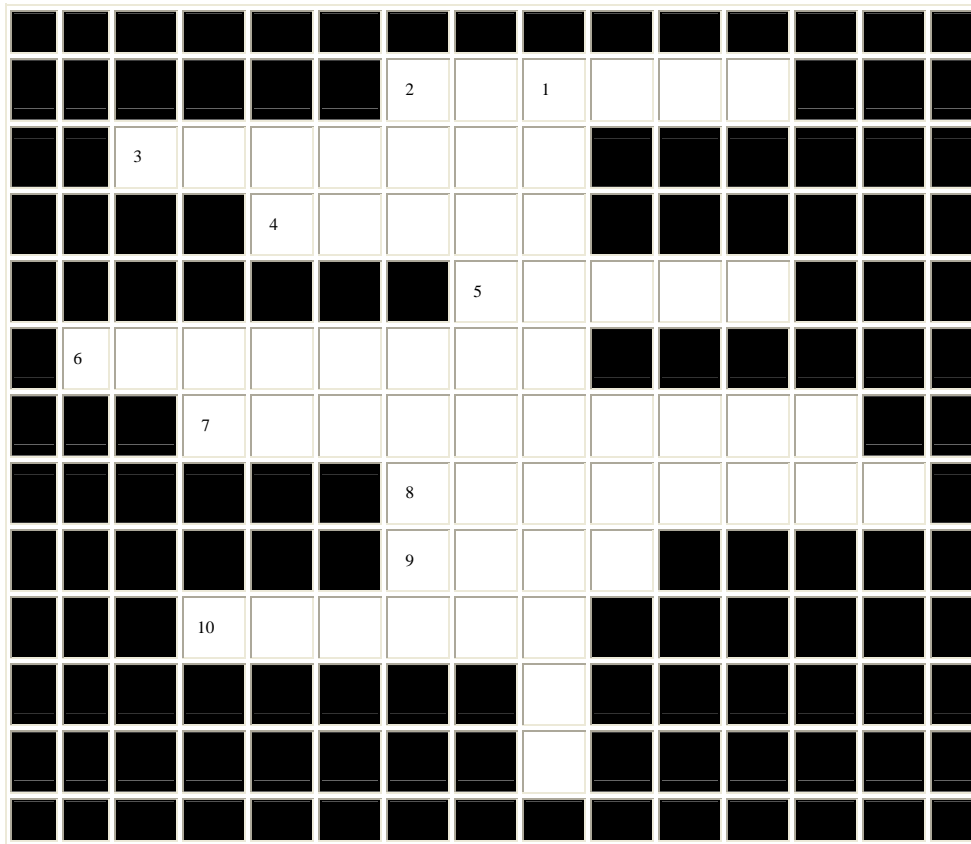
Clue 7 - **Caused due to the presence of additional water in the intestines. The feces can become very watery.**

Clue 8 - **Small cholesterol deposits that form in the gallbladder. When gallstones can be secreted into the bile duct. When this happens, they block the flow of bile causing severe pain.**

Clue 9 - **Small pores or openings in the lining of the stomach. Caused due to the presence of excessive acid or bacteria in the stomach.**

## Digestive System Crossword

Solve the following crossword puzzle.



### ACROSS

2. Breaks down proteins into shorter polypeptide chains.
3. An enzyme found in the mouth that breaks down starch.
4. Produces bile.
5. Increases the surface area for absorbing broken down food products in the small intestine.
6. The organ in charge of making insulin.
7. Small cholesterol deposits that form in the gallbladder. When this happens they block the flow of bile causing severe pain.
8. Caused due to the presence of additional water in the intestines. The feces can become very watery.
9. A liquid that digests large fat particles.
10. Small pores or openings in the lining of the stomach. Caused due to the presence of excessive acid or bacteria in the stomach.

### DOWN

1. The movement of food through the digestive system.

## Digestive System Quiz

**Directions:** Match the terms to the definitions on the right. Place the correct letter to the left of each number.

- |                           |                                                                                                                                          |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| _____ 1. Bile             | <b>A. The movement of food through the digestive system.</b>                                                                             |
| _____ 2. Amylase          | <b>B. Caused due to the presence of additional water in the intestines. The feces can become very watery.</b>                            |
| _____ 3. Pepsin           | <b>C. Longest Digestive tube in the human digestive system.</b>                                                                          |
| _____ 4. Small Intestine  | <b>D. Increases the surface area for absorbing broken down food products in the small intestine.</b>                                     |
| _____ 5. Gall Stones      | <b>E. Produces bile.</b>                                                                                                                 |
| _____ 6. Liver            | <b>F. Small cholesterol deposits that form in the gallbladder.</b>                                                                       |
| _____ 7. Ulcers           | <b>G. An enzyme found in the mouth that breaks down starch.</b>                                                                          |
| _____ 8. Pancreas         | <b>H. Small pores or openings in the lining of the stomach. Caused due to the presence of excessive acid or bacteria in the stomach.</b> |
| _____ 9. Diarrhea         | <b>I. The organ in charge of making insulin.</b>                                                                                         |
| _____ 10. Peristalsis     | <b>J. Where bile is stored.</b>                                                                                                          |
| _____ 11. Villi           | <b>K. Breaks down proteins into shorter polypeptide chains.</b>                                                                          |
| _____ 12. Large Intestine | <b>L. Digestive organ; main responsibility is to remove water.</b>                                                                       |
| _____ 13. Gall Bladder    | <b>M. A liquid that digests large fat particles.</b>                                                                                     |

## Digestive System Travel Brochure

**Problem:** How would you promote the activities that take place within the digestive system? What is the function of each part in this system?

**Materials:** 3 chart papers folded, your writing instrument of choice, 3 pieces of poster board.

**Procedure:**

1. In groups of two, you will design brochures and advertise the digestive system as if it were a tourist attraction.
2. The key feature is to give an overall sense of the organization and function of digestive system. You may use drawings, computer graphics, or photographs of actual organs, pictures from magazines, journals, or books to help in your advertisement of this system. Let your imagination run WILD!
3. You are to give your digestive system tour a name.
4. Your brochure must include the following vocabulary: mouth, esophagus, epiglottis, stomach, pepsin, small intestine, liver, gall bladder, bile, large intestine, peristalsis, villi.
5. Each group will orally present its brochure to the class.

## Digestive System Square Puzzle

**Directions:** Cut out the squares and rearrange them so that the touching sides match.  
For example:

Mouth
Digestion begins here.

lung	Finger-like projections	trachea	Watery feces.
epiglottis	constipation	Gall bladder	weather
M	B	A	C
brain	feet	Deposits in the gall bladder	ulcer
stomach	pancreas	insulin	Contracting of smooth muscles.
Large intestine	Gastric juices	egg	peristalsis
Gallstones	Follicle	Makes bile	cerebrum
P	D	E	N
Dry feces	Digests fat particles.	covers trachea	Bile is stored here.
Food pipe.	nerves	amylase	Composed of HCl + pepsin.
Mouth	Contains HCl	Regulates sugar in the blood.	heart
Hole in stomach.	Absorbs food & minerals	Bile	blood
H	F	G	K
Pepsin	skin	Physical digestion	Bile is stored . here.
Wind pipe	villi	veins	diarrhea
atom	Esophagus	makes insulin	Breaks down starch.
Gall bladder	teeth	Digestion of lipids.	Breaks down protein
L	O	J	B
Liver	lipase	tendons	Small intestine
Where digestion begins	Muscle	insulin	Absorbs water

## Circulatory System

The circulatory system is a complex series of tubes that transports nutrient-rich blood and waste products throughout the entire body.

### What does blood consist of?

The blood consists of approximately 78 percent water. The remaining portion of blood is solid, mostly in the form of protein. Red cells, white cells and platelets are made in the marrow of bones, especially the vertebrae, ribs, hips, skull and sternum.

The main components of human blood are:

- **Plasma** – This is the watery portion of the blood. Blood cells are suspended here.
- **Red Blood Cells (Erythrocytes)** – Using hemoglobin, these cells carry oxygen from the lungs throughout the entire body.
- **White Blood Cells (Leukocytes)** – These cells aid the immune response. They help fight off infections by engulfing and destroying foreign invaders.
- **Platelets (Thrombocytes)** – Helps the blood clot.

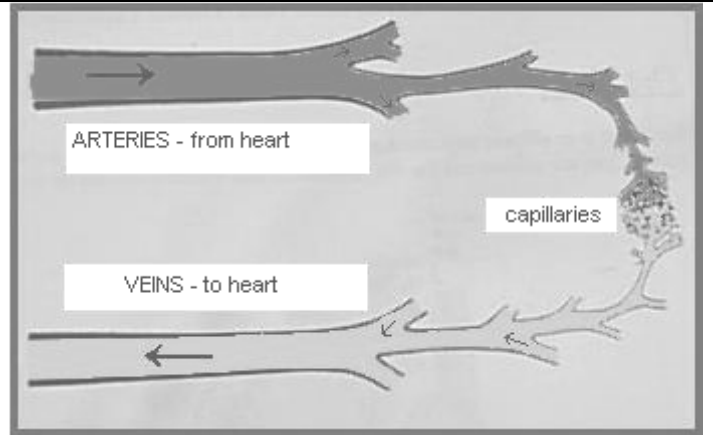
### ABO Blood Grouping System:

Blood is grouped based on the inherited properties of the red blood cells. Blood type is determined by a human's genetic possession or lack of antigens A and/or B. Humans may have type A, type B, type AB, or type O blood. Blood can be shared between groups as long as the recipient can accept the antigen present in the blood they are receiving.

Blood Type	Blood - type they can receive.	Blood type they can donate to.
A	A,O	A, AB
B	B,O	B, AB
AB	A, B, AB, O	AB
O	O	A, B, AB, O

**Blood Vessels:**

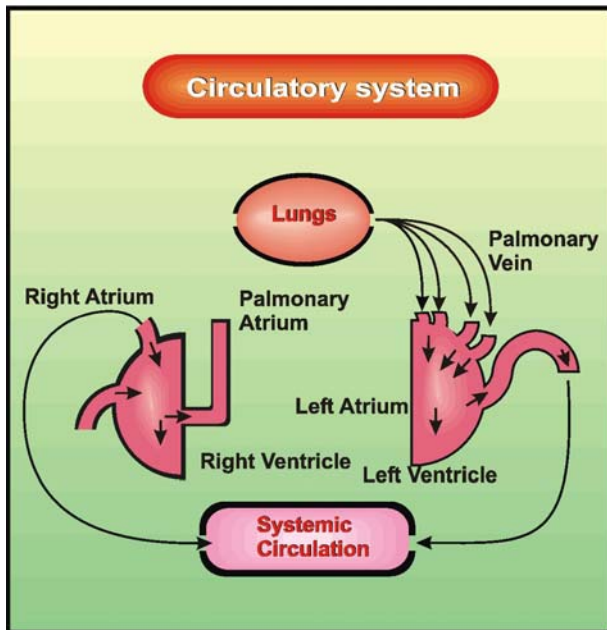
- ✓ **Arteries**- Semi-elastic vessels that transport blood away from the heart.
- ✓ **Veins**- Elastic vessels that transport blood to the heart.
- ✓ **Capillaries**- Vessels located within the tissues of the body that transport blood from the arteries to the veins. They are the connectors of the blood pathway.

**What is found Between Tissues?**

**Intercellular Fluid** is the fluid found between cells & tissues. This medium provides for the exchange of materials between cells and tissues. **Lymph** is a yellowish fluid that is found within the vessels of lymphatic system. Lymph fluid carries white blood cells throughout the blood. It is formed from the plasma that diffuses out of the capillaries and into the lymphatic vessels.

**Cardiovascular Diseases:**

1. **Hypertension** - High blood pressure. The leading causes for hypertension include stress, diet, heredity, smoking, and aging.
2. **Coronary Thrombosis** - Heart attack. Caused due to a blockage; usually in the arterial walls.
3. **Angina Pectoris** - A narrowing of arteries due to the buildup of fatty deposits.
4. **Anemia** - Due to low amounts of hemoglobin in blood. Blood cannot carry enough oxygen. Leads the patient feeling constantly tired.
5. **Leukemia** - Makes a large number of abnormal white blood cells.



### The Heart:

The Heart is made of **cardiac muscle** and is surrounded by **pericardium**. It is composed of 4 chambers. The 2 upper chambers (**atria**) receive blood and the lower 2 chambers (**ventricles**) pump blood out. Heart valves, located between the chambers, prevent the back flow of blood.

The **septum** separates the heart into 2 sides (right and left). The heart functions as a double pump: the **right side** sends oxygen poor (**deoxygenated**) blood to the lungs and the **left side** sends oxygen rich (**oxygenated**) blood throughout the body.

### Circulation of Blood through the Body:

**Pulmonary Circulation** - The movement of blood between the heart and lungs.

**Systemic Circulation** - The movement of blood between the heart and the rest of the body, excluding the lungs.



Name \_\_\_\_\_

Date \_\_\_\_\_

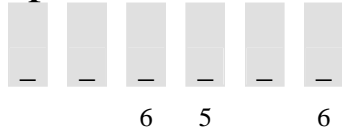
## Circulatory System Definitions

<b>Plasma</b>	
<b>Red Blood Cells</b>	
<b>White Blood Cells</b>	
<b>Platelets</b>	
<b>Blood Type AB</b>	
<b>Blood Type O</b>	
<b>Arteries</b>	
<b>Veins</b>	
<b>Capillaries</b>	
<b>Hypertension</b>	
<b>Coronary Thrombosis</b>	
<b>Angina Pectoris</b>	
<b>Anemia</b>	
<b>Leukemia</b>	
<b>Atria</b>	
<b>Ventricles</b>	
<b>Pulmonary Circulation</b>	
<b>Systemic Circulation</b>	

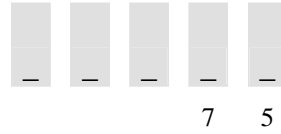
## Circulatory System Cryptogram

**Riddle:** How many gallons of blood a day does the human heart pump?

mslaap



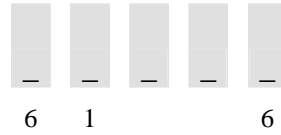
nesiv



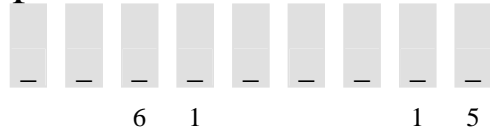
iemnaa



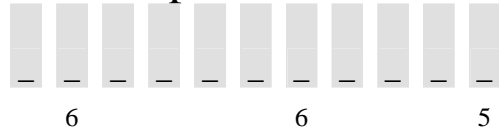
irata



epleasttl



ielacsialrp



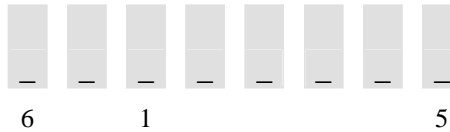
kelmuaie



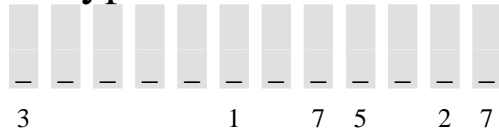
nevcestilr



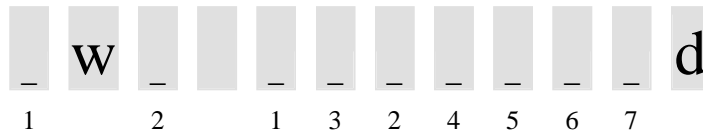
eesartir



ninhypetorse

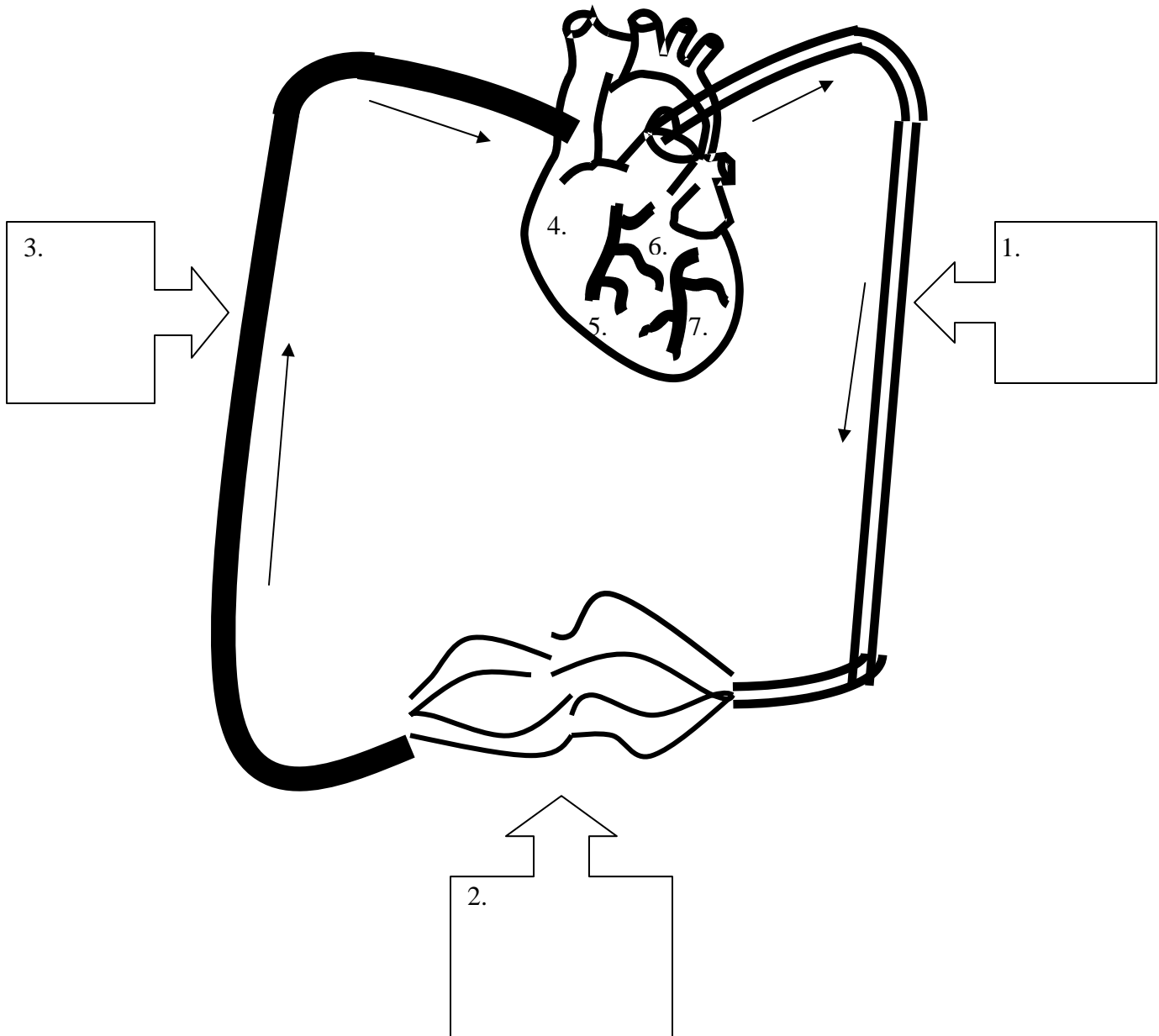


**ANSWER:**



## Circulatory System Graphic Organizer

Directions: Label all parts of the circulatory system.



## Circulatory System Word Search

G Q H O S N E S L I M R G X F S Z  
P L A T E L E T S T M T U V H L I  
B Z R P X N V O U K G I P Z T X L  
L D I Q W H K J B F V E I N S E I  
Q N J Q F Y N S P L A S M A V A U  
C N E I V T H P R T A V C Q E N L  
R K B A L G F T X T D N Y B N E E  
B Q H Y P E R T E N S I O N T M U  
A R T E R I E S W W A T E R R I K  
S D E A M Z U T O M N P H A I A E  
E P G Z A H A L O F F L Y R C I M  
P Z X K A N H D R H Q R C T L K I  
T G P X V W N B W N I W Z R E W A  
U C E I B N H Y Y I M F M I S D N  
M C V P M B E K W B X Y Y A L H U  
K E X O M Y C A P I L L A R I E S  
C U W A C J F O M S R I I D J N O

Clue 1 - This is the watery portion of the blood. Blood cells are suspended here.

Clue 2 - The blood consists of approximately 78 percent of this.

Clue 3 - Helps the blood clot.

Clue 4 - Semi elastic vessels that transport blood away from the heart.

Clue 5 - Elastic vessels that transport blood to the heart.

Clue 6 - Vessels located within the tissues of the body that transport blood from the arteries to the veins.

Clue 7 - High blood pressure.

Clue 8 - Due to low amounts of hemoglobin in blood. Blood cannot carry enough oxygen.

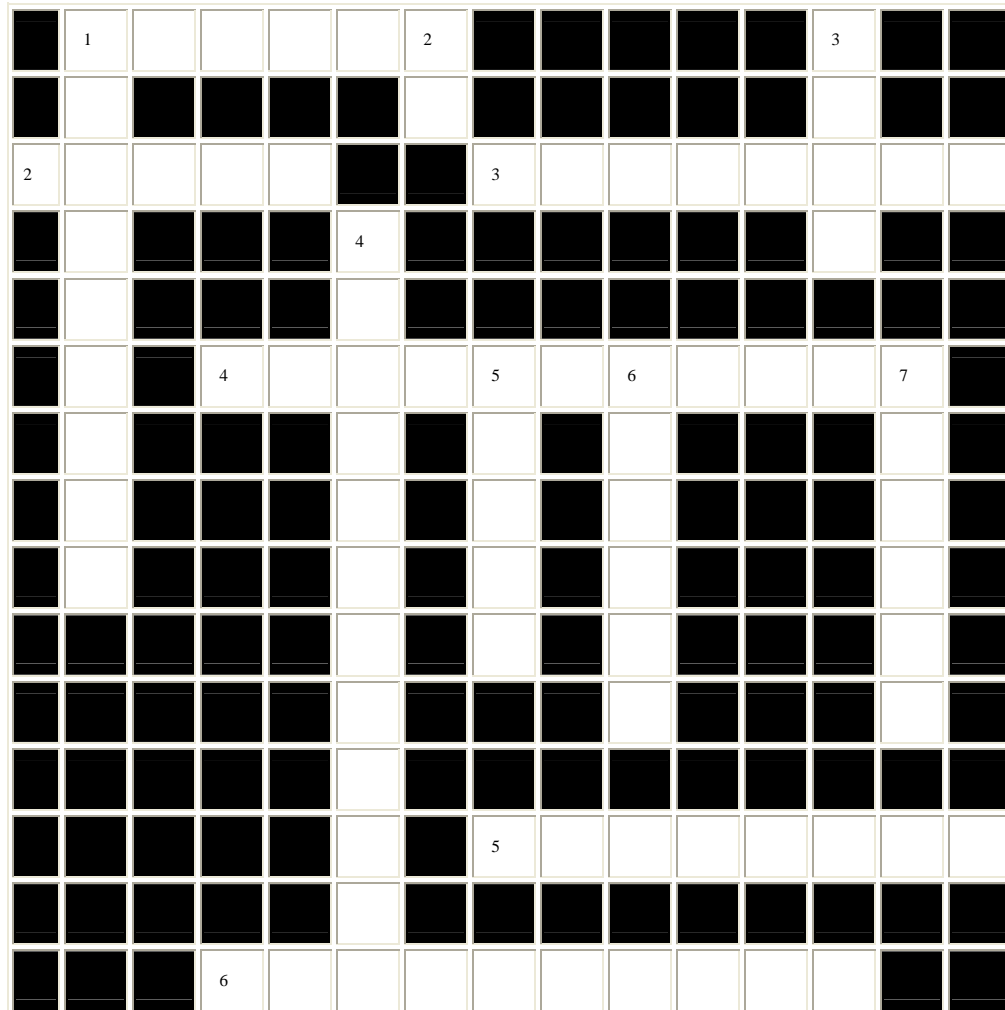
Clue 9 - Makes a large number of abnormal white blood cells.

Clue 10 - Separates the heart into 2 sides.

Clue 11 - The lower chambers of the heart.

## Circulatory System Crossword

Solve the following crossword puzzle.



### ACROSS

1. This is the watery portion of the blood.
2. 78% of the blood consists of this.
3. Semi-elastic vessels that transport blood away from the heart.
4. Vessels located within the tissues of the body that transport blood from the arteries to the veins.
5. Makes a large number of abnormal white blood cells.
6. The pump portion of the heart.

### DOWN

1. Helps the blood clot.
2. This blood type can accept blood from all other blood types.
3. Elastic vessels that transport blood to the heart.
4. High blood pressure.
5. Yellowish fluid that is found within the vessels of lymphatic system.
6. Due to low amounts of hemoglobin in blood. Blood cannot carry enough oxygen.
7. This separates the heart into 2 sides.

## Circulatory System Quiz

1. What do the red blood cells pick up from the lungs to carry to the rest of the body?

\_\_\_\_\_

2. What blood cell type is responsible for fighting off infection?

\_\_\_\_\_

3. Which blood vessels carry blood away from the heart?

\_\_\_\_\_

4. When you get a cut on your finger, what part of the blood helps clot the blood?

\_\_\_\_\_

5. What is the liquid portion of the blood called?

\_\_\_\_\_

6. What blood type is the universal acceptor of all other blood types?

\_\_\_\_\_

7. What blood type can be accepted by all other blood types?

\_\_\_\_\_

8. What cardiovascular disease creates a large number of abnormal white blood cells?

\_\_\_\_\_

9. Pulmonary circulation is the movement of blood between the heart and the \_\_\_\_\_.

\_\_\_\_\_

10. What separate the heart into two sides?

\_\_\_\_\_

## Circulatory Matching Quiz

**Directions:** Match the terms to the definitions on the right. Place the correct letter to the left of each number.

- |                             |                                                                                 |
|-----------------------------|---------------------------------------------------------------------------------|
| ____ 1. Plasma              | A. This blood type can accept blood from all other blood types.                 |
| ____ 2. Water               | B. The pump portion of the heart.                                               |
| ____ 3. Arteries            | C. Elastic vessels that transport blood to the heart.                           |
| ____ 4. Leukemia            | D. This separates the heart into 2 sides.                                       |
| ____ 5. Ventricles          | E. Semi-elastic vessels that transport blood away from the heart.               |
| ____ 6. Platelets           | F. Yellowish fluid that is found within the vessels of lymphatic system.        |
| ____ 7. O                   | G. This is the watery portion of the blood.                                     |
| ____ 8. Intercellular Fluid | H. This blood type can donate blood to all other blood types.                   |
| ____ 9. Septum              | I. Makes a large number of abnormal white blood cells.                          |
| ____ 10. Anemia             | J. Helps the blood clot.                                                        |
| ____ 11. AB                 | K. 78% of the blood consists of this.                                           |
| ____ 12. Veins              | L. Due to low amounts of hemoglobin in blood. Blood cannot carry enough oxygen. |

# The Cardiac 100

**Problem:** What eight-stage path does a single drop of blood follow through the heart from the Vena Cava to the Aorta?

**Hypothesis:**

<b>Vena cava (inferior &amp; superior)</b>
<b>Aorta (Out to the body)</b>

**Materials:** 5 sheets of unlined paper, assorted markers and color pencils, rulers, protractors.

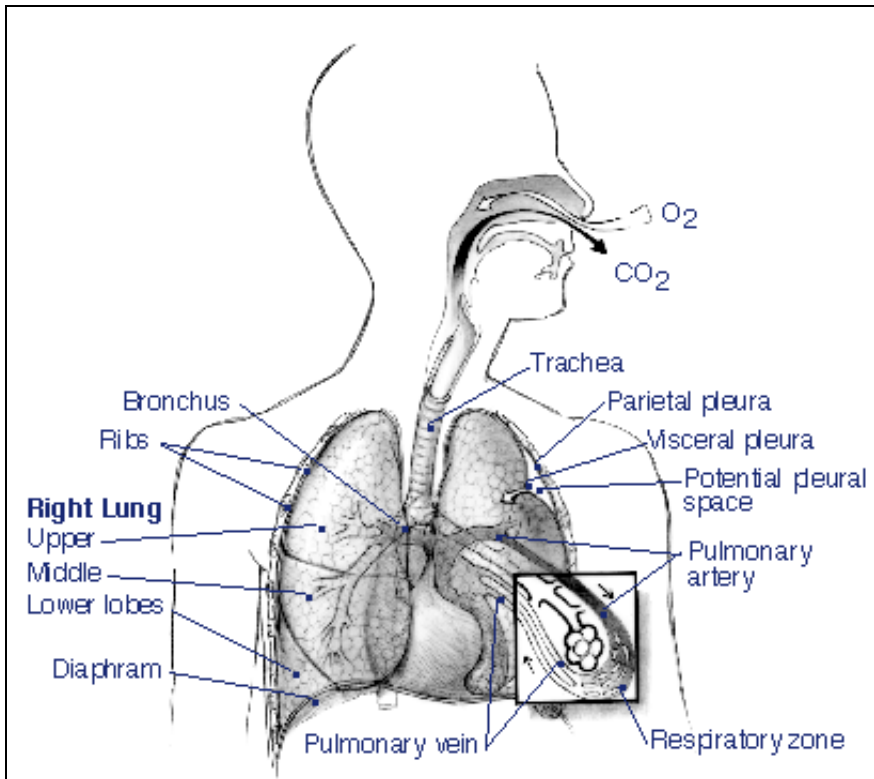
**Background:** You are a blood vessel in the human body. You have been personally assigned the task of developing the Cardiac 100 Racecourse. This is a race ran by all the blood in the body daily. See you are getting old (84 hours old) and you must teach the new blood (no pun intended) cells how to get around the heart before you pass on. What you need to do is make a map of the racecourse.

**Procedures:**

1. Make sure to get five pieces of white unlined paper.
2. With the first piece of paper, you must make a miniature drawing of your racecourse. Your racecourse represents the passage of blood through the heart. Remember that your racecourse has eight stages the participants (blood) must pass through. The starting line being the vena cava and the finish line being the aorta.
3. Have this mini drawing approved by your teacher (get a signature).
4. Using the other four sheets of paper, tape them together to make one big drawing space.
5. Enlarge your mini-drawing to a full-scale diagram of your racecourse on the four sheets of paper.
6. Make it colorful. The quality (neatness, attention to detail) of this drawing racecourse will severely reflect the grade of this lab. Take your time!



## Human Respiration



### The Air Pathway:

1. **Nasal Cavity** - Warms moistens, & filters air as it is inhaled.
2. **Pharynx (throat)** - Passageway that leads to trachea.
3. **Trachea** (windpipe) - Cartilage keeps the trachea open. The trachea is lined with cilia, which filters the air before it reaches the lungs.
4. **Bronchi** (left & right) - These branches lead to the lungs.
5. **Bronchioles** - These small branches lead to the air sacs.
6. **Alveoli** - The functional unit of the respiratory system. This is where oxygen and carbon dioxide are exchanged.  $O_2$  enters the blood;  $CO_2$  is removed from the blood.

### Respiratory Disorders:

1. **Emphysema** - Involves over-distention and destruction of the air spaces in the lungs.
2. **Asthma** - Labored breathing caused by narrowing of the air passages (past the bronchi) in the lungs, associated with shortness of breath, wheezing, and coughing. Asthma is usually induced by an allergic reaction or environmental factor.
3. **Cystic Fibrosis** - A recessive genetic disorder affecting the mucus lining of the lungs, leading to breathing problems and other difficulties.

Name \_\_\_\_\_

Date \_\_\_\_\_

## Respiratory System Definitions

<b>Nasal Cavity</b>	
<b>Pharynx</b>	
<b>Trachea</b>	
<b>Cilia</b>	
<b>Bronchi</b>	
<b>Bronchioles</b>	
<b>Alveoli</b>	
<b>Emphysema</b>	
<b>Asthma</b>	
<b>Cystic Fibrosis</b>	

# Respiratory System Cryptogram

**Riddle:** What regulates whether materials that you take in through your mouth travel down your esophagus or your trachea?

pxynhra



icial



3 4 3

lhronocbeis



5 3 5 4 1 7

sphyeamme



2 7 1

ahterac



1

bhicrno



5 3

olielav



4 1 5 4 3

mthasa



7 6

**ANSWER:**



1 2 3 4 5 6 6 3 7

## Respiratory Word Search

U K T V J X J T R A C H E A  
I W T B B R O N C H I O X Z  
T J B P G B M K H I E T P U  
D W M N Q W H L F E M V O A  
O O Q P M P I V R Y P C S K  
M X Z T F P N J L Z H W C W  
D Y A N C H J Q I Y Y G Y K  
W G S G F O F H G P S U G I  
A E T W W J I W G K E S J C  
Y N H P H A R Y N X M U R I  
H L M A F R Y P O F A V C L  
K D A J A X P J Y M F I U I  
B O E T Y C O P K Z P P R A  
O F F T A I E A L V E O L I

**Clues:**

Clue 1 - **Passageway that leads to trachea.**

Clue 2 - **The windpipe.**

Clue 3 - **These branches lead to the lungs.**

Clue 4 - **The functional unit of the respiratory system.**

Clue 5 - **Involves over distention and destruction of the air spaces in the lungs.**

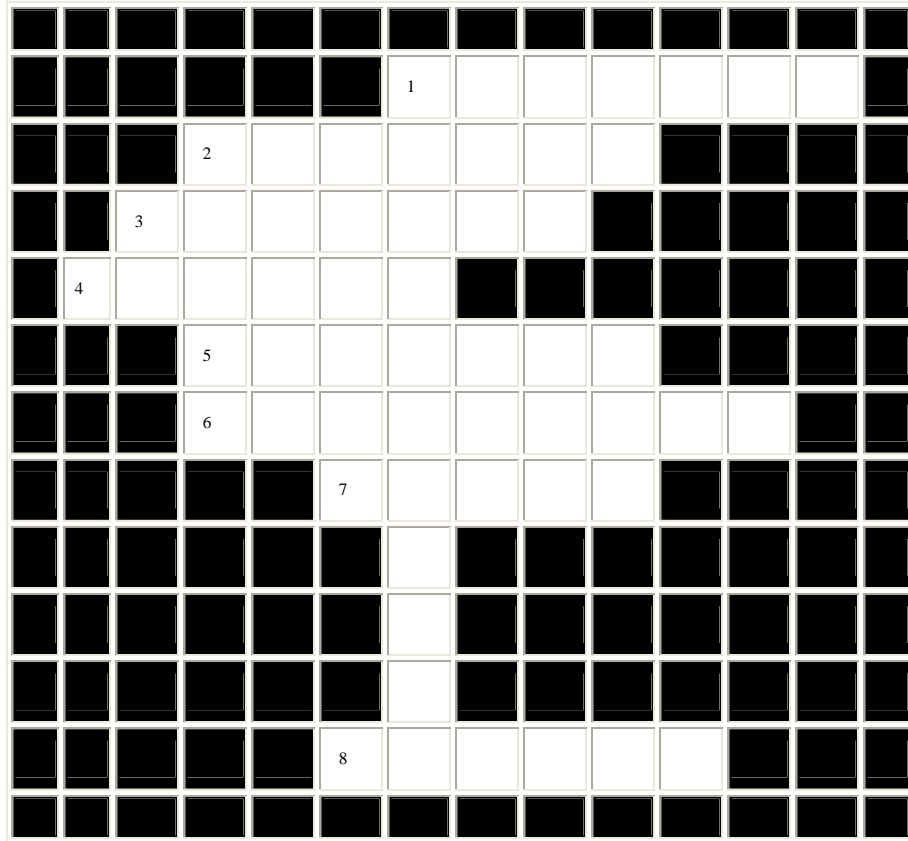
Clue 6 - **Induced by an allergic reaction or environmental factor.**

Clue 7 - **Gas input into the blood at the site of the alveoli.**

Clue 8 - **Lines the respiratory track. Filters air of irritants.**

## Respiratory Crossword

Solve the following crossword puzzle.



### ACROSS

1. These branches lead to the lungs.
2. Passageway that leads to trachea.
3. The functional unit of the respiratory system.
4. Gas input into the blood at the site of the alveoli.
5. The windpipe.
6. Involves over distention and destruction of the air spaces in the lungs.
7. Lines the respiratory track. Filters air of irritants.
8. Induced by an allergic reaction or environmental factor.

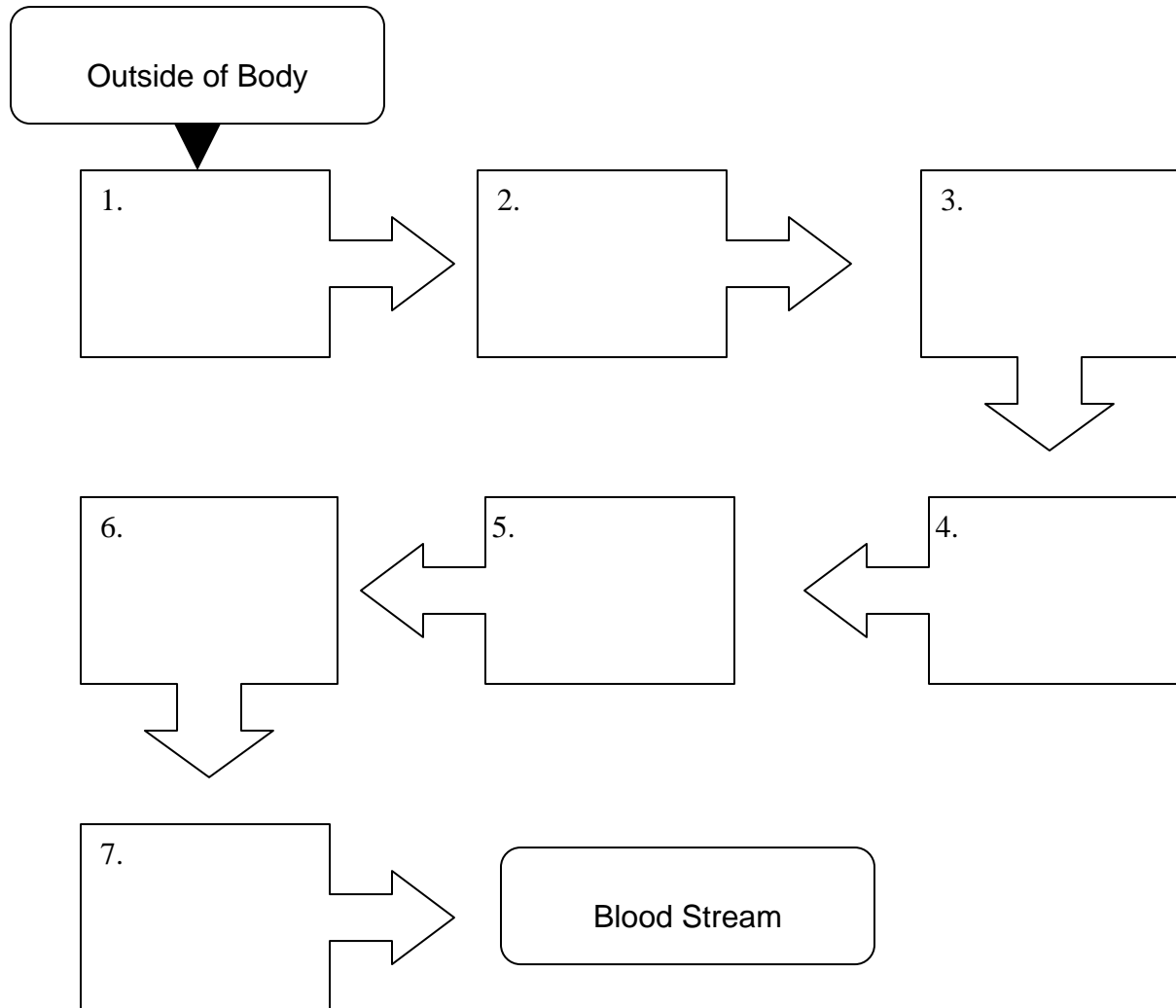
### DOWN

1. These small branches lead to the air sacs.

## The Oxygen Treasure Map

Write the path of oxygen from outside of the body to the blood stream. Use the following words to help:

**Bronchi, Alveoli, Trachea, Nasal Cavity, Capillary, Pharynx, Bronchioles**

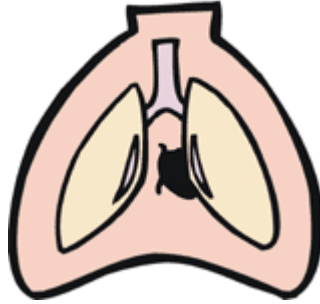


## Respiratory Matching Quiz

**Directions:** Match the terms to the definitions on the right. Place the correct letter to the left of each number.

- |                         |                                                                                                                                                                                                                                       |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ____ 1. Emphysema       | A. A recessive genetic disorder affecting the mucus lining of the lungs, leading to breathing problems and other difficulties.                                                                                                        |
| ____ 2. Trachea         | B. The major organ associated with the human respiratory system.                                                                                                                                                                      |
| ____ 3. Bronchioles     | C. Passageway that leads to trachea.                                                                                                                                                                                                  |
| ____ 4. Asthma          | D. This gas is a waste product that is removed by the respiratory system.                                                                                                                                                             |
| ____ 5. Pharynx         | E. These branches lead to the lungs.                                                                                                                                                                                                  |
| ____ 6. Alveoli         | F. Moistens, & filters air as it is inhaled.                                                                                                                                                                                          |
| ____ 7. Nasal Cavity    | G. These small branches lead to the air sacs.                                                                                                                                                                                         |
| ____ 8. Bronchi         | H. This gas is inhaled through the nostrils and is used during cellular respiration.                                                                                                                                                  |
| ____ 9. Cystic Fibrosis | I. Labored breathing caused by narrowing of the air passages (past the bronchi) in the lungs, associated with shortness of breath, wheezing, and coughing. Asthma is usually induced by an allergic reaction or environmental factor. |
| ____ 10. Oxygen         | J. Lined with cilia, which filters the air before it reaches the lungs.                                                                                                                                                               |
| ____ 11. Lung           | K. Involves over-distention and destruction of the air spaces in the lungs.                                                                                                                                                           |
| ____ 12. Carbon Dioxide | L. This is where oxygen and carbon dioxide are exchanged. O <sub>2</sub> enters the blood; CO <sub>2</sub> is removed from the blood.                                                                                                 |

## The Diaphragm in Action!



### Materials Needed:

2 drinking straws, scissors, 2 small Balloons, 2 large Balloons, small rubber band, large rubber band, rubber cement, masking tape, plastic cup

### Procedures:

1. Cut a drinking straw to about 2 inches in length.
2. Cut the straw into a triangle in the center.
3. Fit a small balloon over one end of the straw.
4. Secure the balloon with a small rubber band. Make certain that the balloon is secure so that air will not escape either balloon. You can check this by blowing into the balloon.
5. Bend the straw in the middle.
6. Cut a "V" into the end of the second straw. Fit this straw into the bent straw and cement the two pieces together. Allow this to dry.
7. Cut a small hole in the bottom of the plastic cup; the same exact size as the end of the straw.
8. Push the straw, from outside the cup, into the hole and flush against the cup end.
9. Cement the straw, on the outside, to the cup.
10. Cut the neck of the large balloon off.
11. Stretch the large balloon over the opening of the cup. Secure the ends with the large rubber band.
12. Pull on the large balloon and observe what happens to the smaller balloon.



# Answers

## Page 3

Amylase - an enzyme found in the mouth that breaks down starch.

Epiglottis - covers the trachea (windpipe) allowing food to freely flow to the esophagus followed by the stomach.

Peristalsis - food being pushed through the digestive canal by tiny contracting smooth muscle tissue.

Gastric Juices - composed of hydrochloric acid (HCl) and the enzyme pepsin.

Pepsin - Pepsin breaks down proteins into shorter polypeptide chains.

Villi - increase the surface area for absorbing broken down food products.

Bile - a liquid that digests large fat particles.

Appendicitis - An inflammation of the Appendix.

Constipation - Caused due to lack of water in the intestines.

Creates a condition that makes it difficult to eliminate feces.

Diarrhea - Caused due to the presence of additional water in the intestines. The feces can become very watery.

Prolonged diarrhea can cause dehydration and require medical attention quickly.

Gallstones - Small cholesterol deposits that form in the gallbladder.

Ulcers - Small pores or openings in the lining of the stomach.

## Page 4

Diarrhea	Villi
Liver	Stomach
Bile	Ulcers
Pepsin	Constipation
Appendicitis	Gallstones

One Thousand One Hundred

## Page 5

1. Mouth
2. Esophagus
3. Stomach
4. Liver
5. Small Intestine
6. Large Intestine

## Page 6

M	F	S	B	C	H	X	Q	R	J	Z	O
D	G	O	R	H	J	T	B	D	T	L	C
C	A	P	E	P	S	I	N	O	O	J	K
D	L	G	B	B	F	T	H	Y	U	J	F
I	L	S	Z	I	X	B	Y	L	E	N	D
A	S	M	X	L	X	N	A	Q	Z	C	T
R	T	N	Q	E	C	Y	V	I	L	L	I
R	O	X	D	P	A	N	C	R	E	A	S
H	N	E	A	M	Y	L	A	S	E	Q	K
E	E	D	L	U	I	D	U	F	E	T	R
A	S	J	H	S	R	E	C	L	U	V	V
E	P	E	R	I	S	T	A	L	S	I	S

## Page 7

- Down
1. Peristalsis
- Across
2. Pepsin
  3. Amylase
  4. Liver
  5. Villi
  6. Pancreas
  7. Gallstones
  8. Diarrhea
  9. Bile
  10. Ulcers

## Page 8

1. M
2. G
3. K
4. C
5. F
6. E
7. H
8. I
9. B
10. A
11. D
12. L
13. J

## Page 9

Squares should be arranged in this fashion:

KLEM  
CHBF  
NAPB  
DGOJ

**Page 14**

Plasma - This is the watery portion of the blood. Blood cells are suspended here.

Red Blood Cells - Using hemoglobin, these cells carry oxygen from the lungs throughout the entire body.

White Blood Cells - These cells aid the immune response. They help fight off infections by engulfing and destroying foreign invaders.

Platelets - Helps the blood clot.

Blood Type AB - Can accept blood from all other blood types.

Blood Type O - Can donate blood to all other blood types.

Arteries - Semi-elastic vessels that transport blood away from the heart.

Veins - Elastic vessels that transport blood to the heart.

Capillaries - Vessels located within the tissues of the body that transport blood from the arteries to the veins. They are the connectors of the blood pathway.

Hypertension - High blood pressure. The leading causes for hypertension include stress, diet, heredity, smoking, and aging.

Coronary Thrombosis - Heart attack. Caused due to a blockage, usually in the arterial walls.

Angina Pectoris - A narrowing of arteries due to the buildup of fatty deposits.

Anemia - Due to low amounts of hemoglobin in blood. Blood cannot carry enough oxygen. Leads the patient feeling constantly tired.

Leukemia - Makes a large number of abnormal white blood cells.

Atria - Upper chambers of the heart; receive blood.

Ventricles - Lower chambers of the heart; pump blood.

Pulmonary Circulation - The movement of blood between the heart and lungs.

Systemic Circulation - The movement of blood between the heart and the rest of the body, excluding the lungs.

**Page 15**

Plasma Veins

Anemia Atria

Platelets Capillaries

Leukemia Ventricles

Arteries Hypertension

Two Thousand

**Page 16**

1. Arteries

2. Capillaries

3. Veins

4. Right Atrium

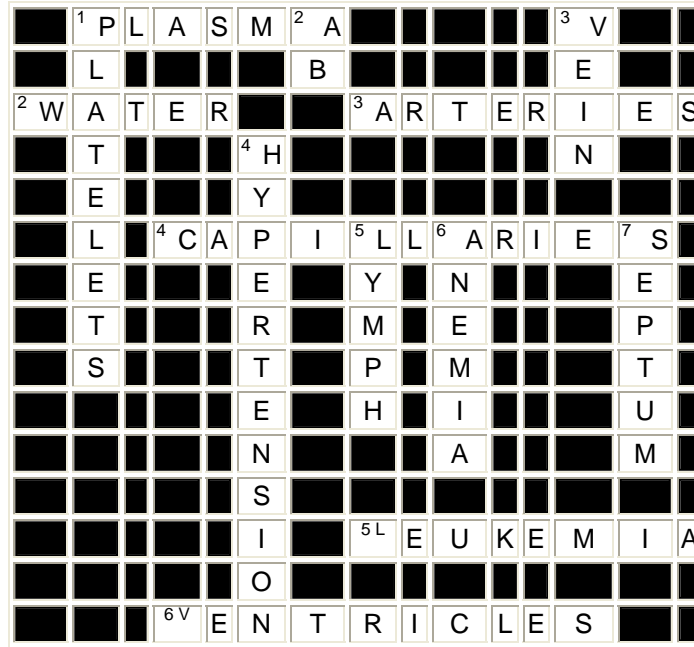
5. Right Ventricle

6. Left Atrium

7. Left Ventricle

**Page 17**

P	L	A	T	E	L	E	T	S	T	M	T	U	V	H	L	I
B	Z	R	P	X	N	V	O	U	K	G	I	P	Z	T	X	L
L	D	I	Q	W	H	K	J	B	F	V	E	I	N	S	E	I
Q	N	J	Q	F	Y	N	S	P	L	A	S	M	A	V	A	U
C	N	E	I	V	T	H	P	R	T	A	V	C	Q	E	N	L
R	K	B	A	L	G	F	T	X	T	D	N	Y	B	N	E	E
B	Q	H	Y	P	E	R	T	E	N	S	I	O	N	T	M	U
A	R	T	E	R	I	E	S	W	W	A	T	E	R	R	I	K
S	D	E	A	M	Z	U	T	O	M	N	P	H	A	I	A	E
E	P	G	Z	A	H	A	L	O	F	F	L	Y	R	C	I	M
P	Z	X	K	A	N	H	D	R	H	Q	R	C	T	L	K	I
T	G	P	X	V	W	N	B	W	N	I	W	Z	R	E	W	A
U	C	E	I	B	N	H	Y	Y	I	M	F	M	I	S	D	N
M	C	V	P	M	B	E	K	W	B	X	Y	Y	A	L	H	U
K	E	X	O	M	Y	C	A	P	I	L	L	A	R	I	E	S
C	U	W	A	C	J	F	O	M	S	R	I	I	D	J	N	O



**Page 19**

1. Oxygen
2. White Blood Cells
3. Arteries
4. Platelets
5. Plasma
6. AB
7. O
8. Leukemia
9. Lungs
10. Septum

**Page 20**

1. G
2. K
3. E
4. I
5. B
6. J
7. H
8. F
9. D
10. L
11. A
12. C

**Page 23**

- Nasal Cavity - Warms moistens, & filters air as it is inhaled.
- Pharynx - Passageway that leads to trachea.
- Trachea - The windpipe.
- Cilia - Filters the air before it reaches the lungs.
- Bronchi - 2 airway branches that lead to the lungs.
- Bronchioles - Small branches lead to the air sacs.
- Alveoli - This is where oxygen and carbon dioxide are exchanged.
- Emphysema - Involves over-distention and destruction of the air spaces in the lungs.
- Asthma - Labored breathing caused by narrowing of the air passages (past the bronchi) in the lungs.
- Cystic Fibrosis - A recessive genetic disorder affecting the mucus lining of the lungs, leading to breathing problems and other difficulties.

**Page 24**

- Pharynx      Cilia
- Bronchioles      Emphysema
- Trachea      Bronchi
- Alveoli      Asthma

Epiglottitis

**Page 25**

U K T V J X J T R A C H E A  
 I W T B B R O N C H I O X Z  
 T J B P G B M K H I E T P U  
 D W M N Q W H L F E M V O A  
 O O Q P M P I V R Y P C S K  
 M X Z T F P N J L Z H W C W  
 D Y A N C H J Q I Y Y G Y K  
 W G S G F O F H G P S U G I  
 A E T W W J I W G K E S J C  
 Y N H P H A R Y N X M U R I  
 H L M A F R Y P O F A V C L  
 K D A J A X P J Y M F I U I  
 B O E T Y C O P K Z P P R A  
 O F F T A I E A L V E O L I

**Page 27**

1. Nasal Cavity
2. Pharynx
3. Trachea
4. Bronchi
5. Bronchioles
6. Alveoli
7. Capillary

**Page 28**

1. K
2. J
3. G
4. I
5. C
6. L
7. F
8. E
9. A
10. H
11. B
12. D

**Page 26**

						1	B	R	O	N	C	H	I	
			2	P	H	A	R	Y	N	X				
		3	A	L	V	E	O	L	I					
	4	O	X	Y	G	E	N							
					5	T	R	A	C	H	E	A		
					6	E	M	P	H	Y	S	E	M	A
						7	C	I	L	L	A			
							O							
							L							
							E							
						8	A	S	T	H	M	A		