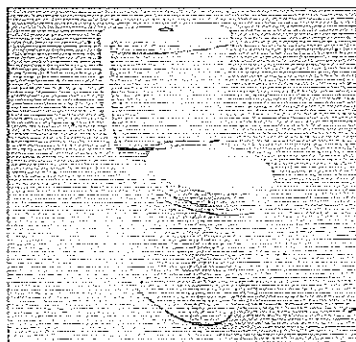
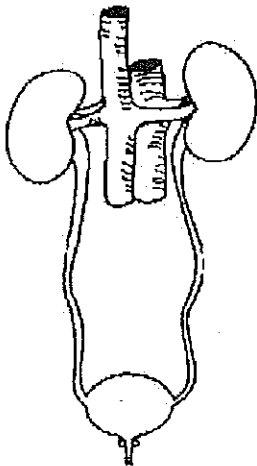
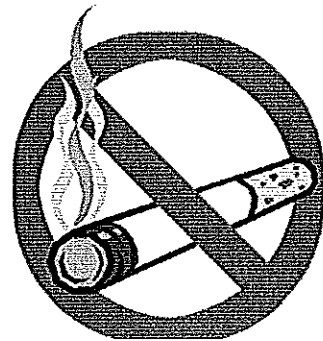
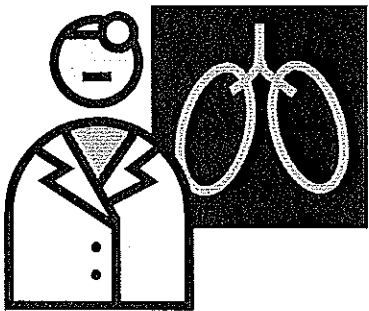


# CHAPTER 16

## Respiration and Excretion



## Chapter 16 Objectives

### Section 1: The Respiratory System

1. List the main functions of the Respiratory System
2. Identify 3 waste products expelled during respiration
3. Locate and describe the functions of the following parts of the respiratory system:
  - a. nostrils
  - b. nose hairs
  - c. mouth
  - d. nasal passages
  - e. larynx
  - f. vocal cords
  - g. epiglottis
  - h. trachea
  - i. cilia
  - j. mucus
  - k. bronchi
  - l. bronchioles
  - m. alveoli
  - n. lungs
  - o. diaphragm

### Section 2: Smoking and Your Health

1. List the harmful chemicals found in tobacco smoke
2. Describe how tobacco smoke can affect a person's health over a long period of time
3. Identify the dangers of the following chemicals:
  - a. Tar
  - b. Carbon Monoxide
  - c. Nicotine
4. Describe the term addiction and its main characteristics
5. Identify the characteristics of the following health problems due to smoking:
  - a. Chronic bronchitis
  - b. Emphysema
  - c. Lung Cancer
  - d. Atherosclerosis
6. Explain what is meant by passive smoking

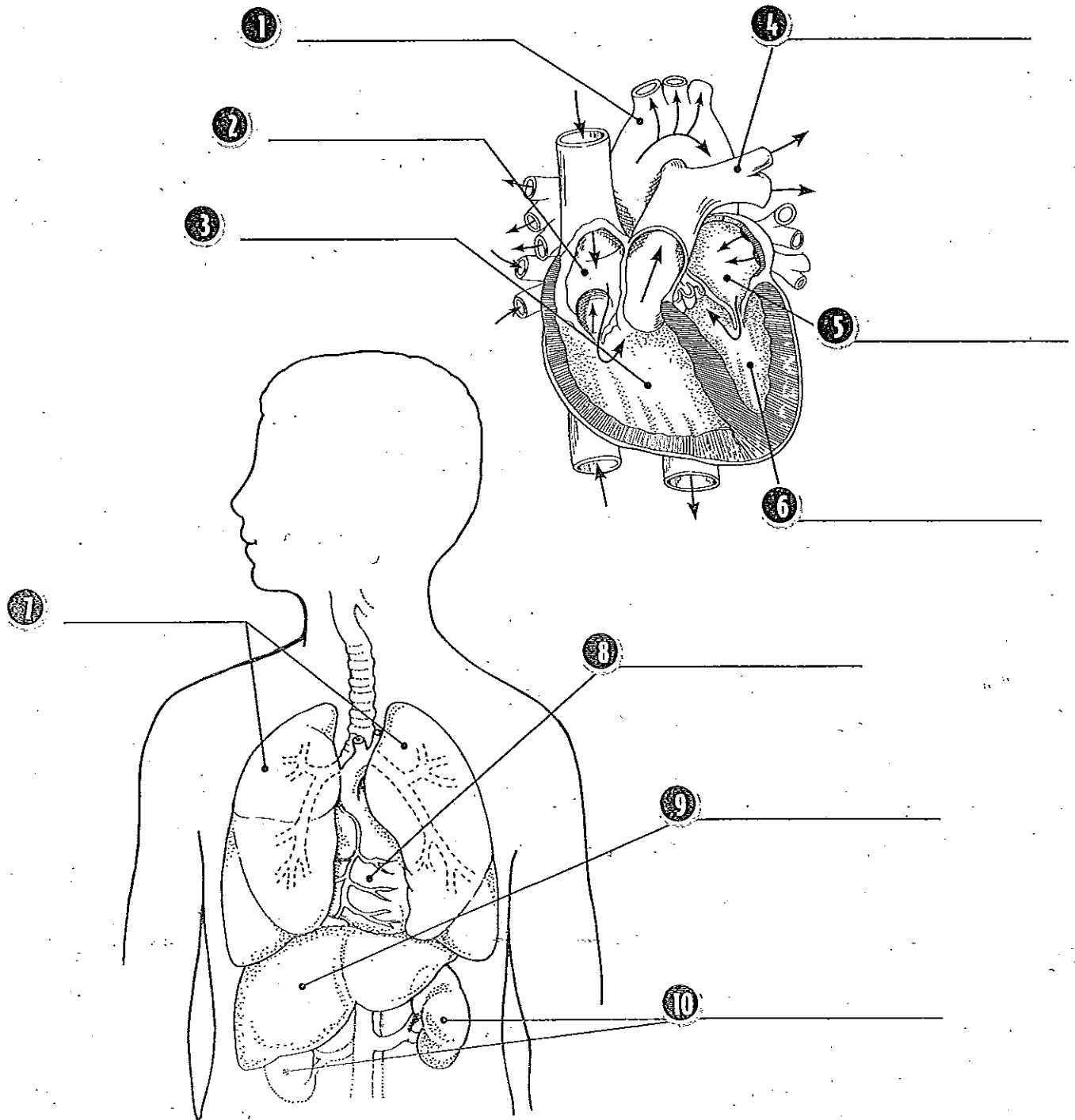
### Section 3: The Excretory System

1. Locate and describe the functions of the following parts of the excretory system:
  - p. liver
  - q. kidney
  - r. nephron
  - s. capsule
  - t. ureters
  - u. urethra
  - v. urinary bladder
  - w. renal artery
  - x. renal vein
2. Explain how and why urea is removed from the body;
3. Describe the action of rib muscles and the diaphragm during inhalation and exhalation;
4. List the steps of blood filtration in the kidneys
5. Describe how the excretory system contributes to homeostasis

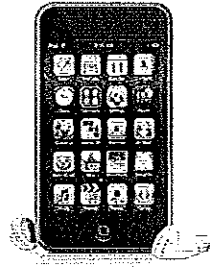
# Circulatory Review

Use the terms in the word box to label each diagram.

- |       |                |                 |                  |             |
|-------|----------------|-----------------|------------------|-------------|
| lungs | kidneys        | right ventricle | pulmonary artery | heart       |
| aorta | left ventricle | liver           | right atrium     | left atrium |



**ITOUCH ACTIVITY:  
RESPIRATORY SYSTEM**



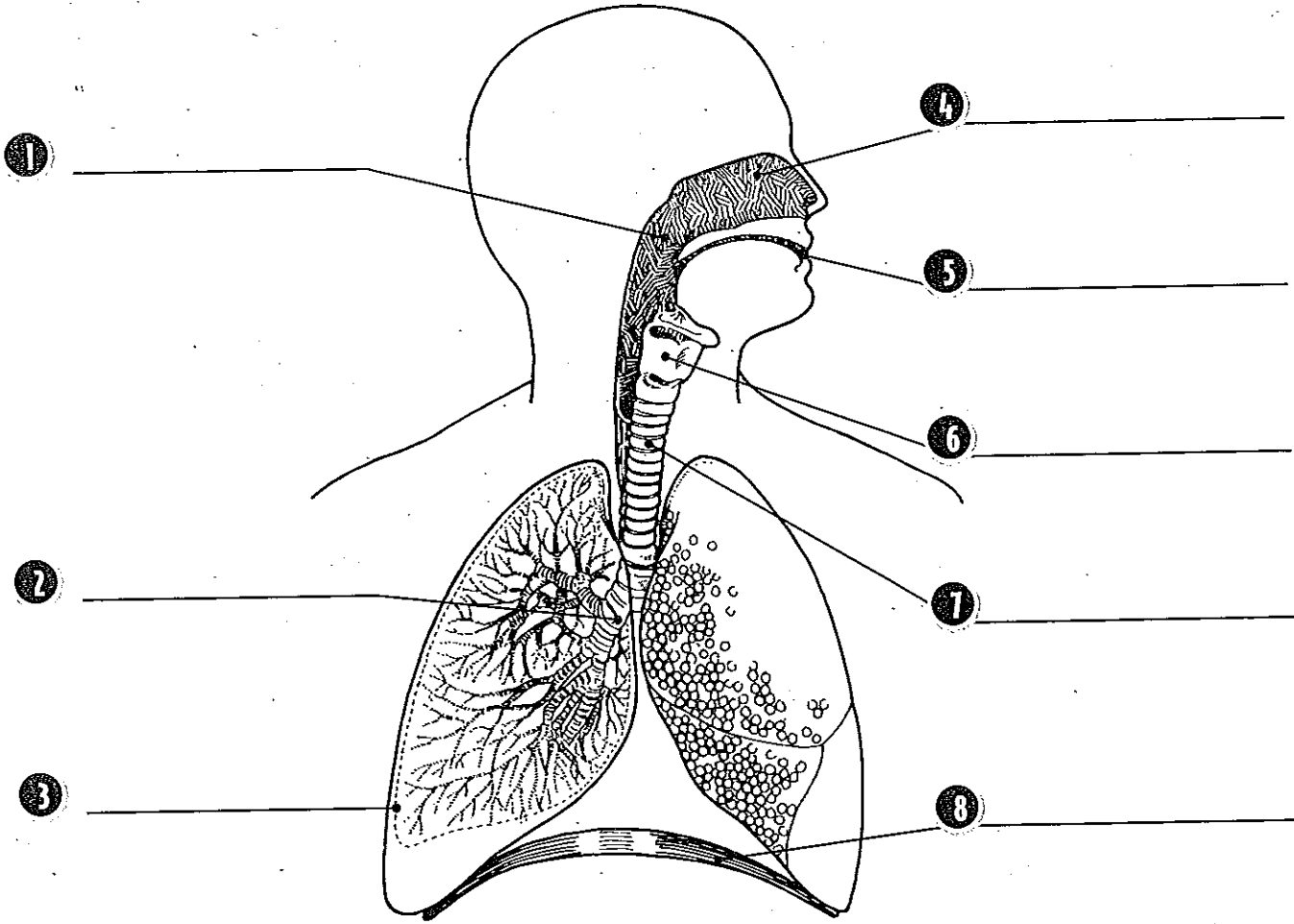
**Directions:** Use the I-Touch to answer the following questions. Click on the "Anatomy 3D" application, then click on "Encyclopedia" and "Respiratory System"

1. What are alveoli?
2. What occurs in alveoli?
3. What are the organs in human respiration?
4. What is the difference between the left and right lung?
5. How many alveoli are in the lungs?
6. What is the main structure that aids in breathing?
7. When the diaphragm contracts, what happens to the position of the lung? Volume? Pressure? Airflow?
8. Once the air enters the oral and nasal cavities, where does it go after?
9. Name 3 other things that lungs do that are not respiratory-related.
10. What are the names of 4 respiratory diseases.

# The Respiratory System

The respiratory system is closely linked to the circulatory system. While the circulatory system transports oxygen to and carbon dioxide from the cells, it is the respiratory system that adds oxygen to the blood and removes carbon dioxide from the body. Use the terms in the word box to label the diagram.

pharynx                      trachea                      larynx                      pleura  
 diaphragm                  bronchial tube              nasal cavity                  mouth



Use the terms in the word box below to match the common names to the scientific names.

throat                      windpipe                      voice box                      lung cover

9 \_\_\_\_\_ larynx                      10 \_\_\_\_\_ pleura  
 11 \_\_\_\_\_ trachea                      12 \_\_\_\_\_ pharynx

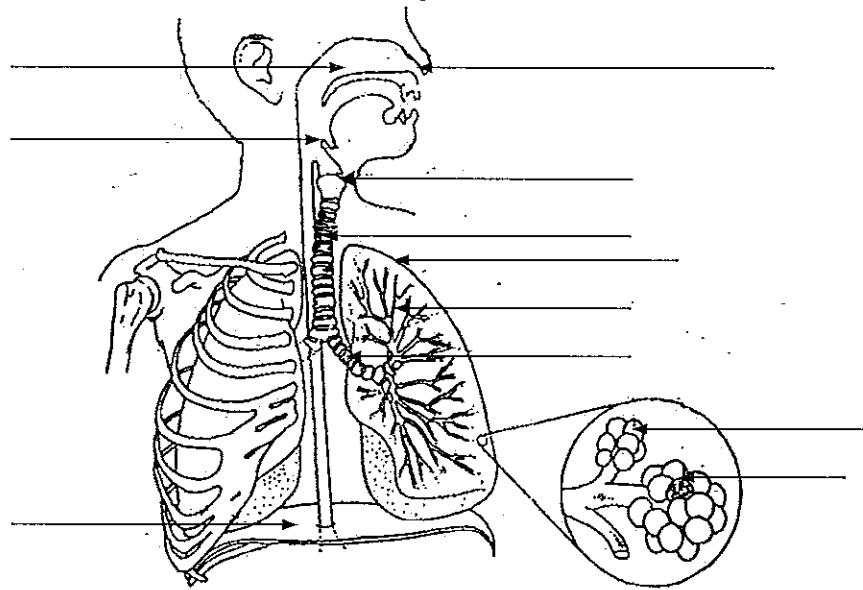
# Labeling the Respiratory System

DIRECTIONS: Match the terms with the proper location on the diagram.

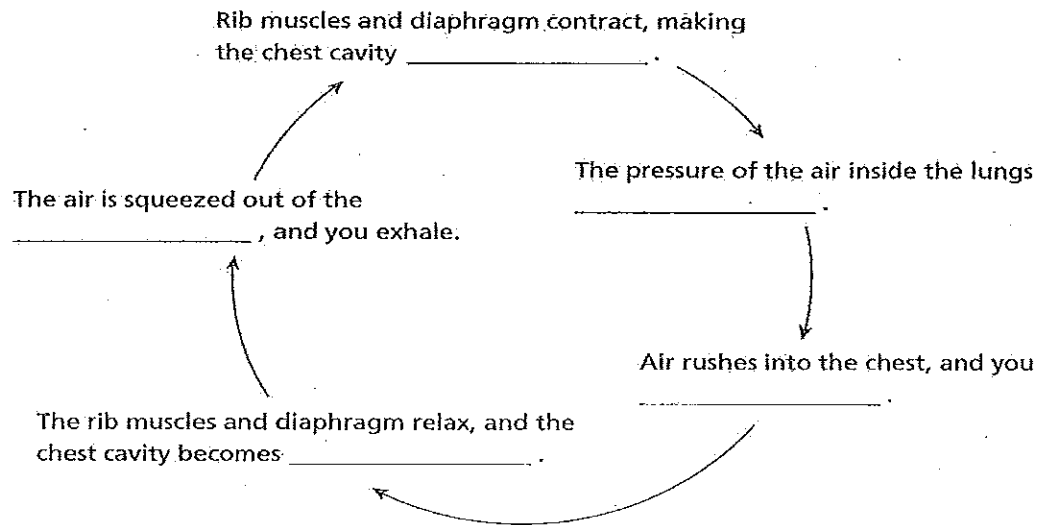
Capillaries  
Lung  
Larynx  
Nose

Nasal cavities  
Pharynx/Epiglottis  
Alveoli  
Bronchi

Bronchioles  
Diaphragm  
Trachea



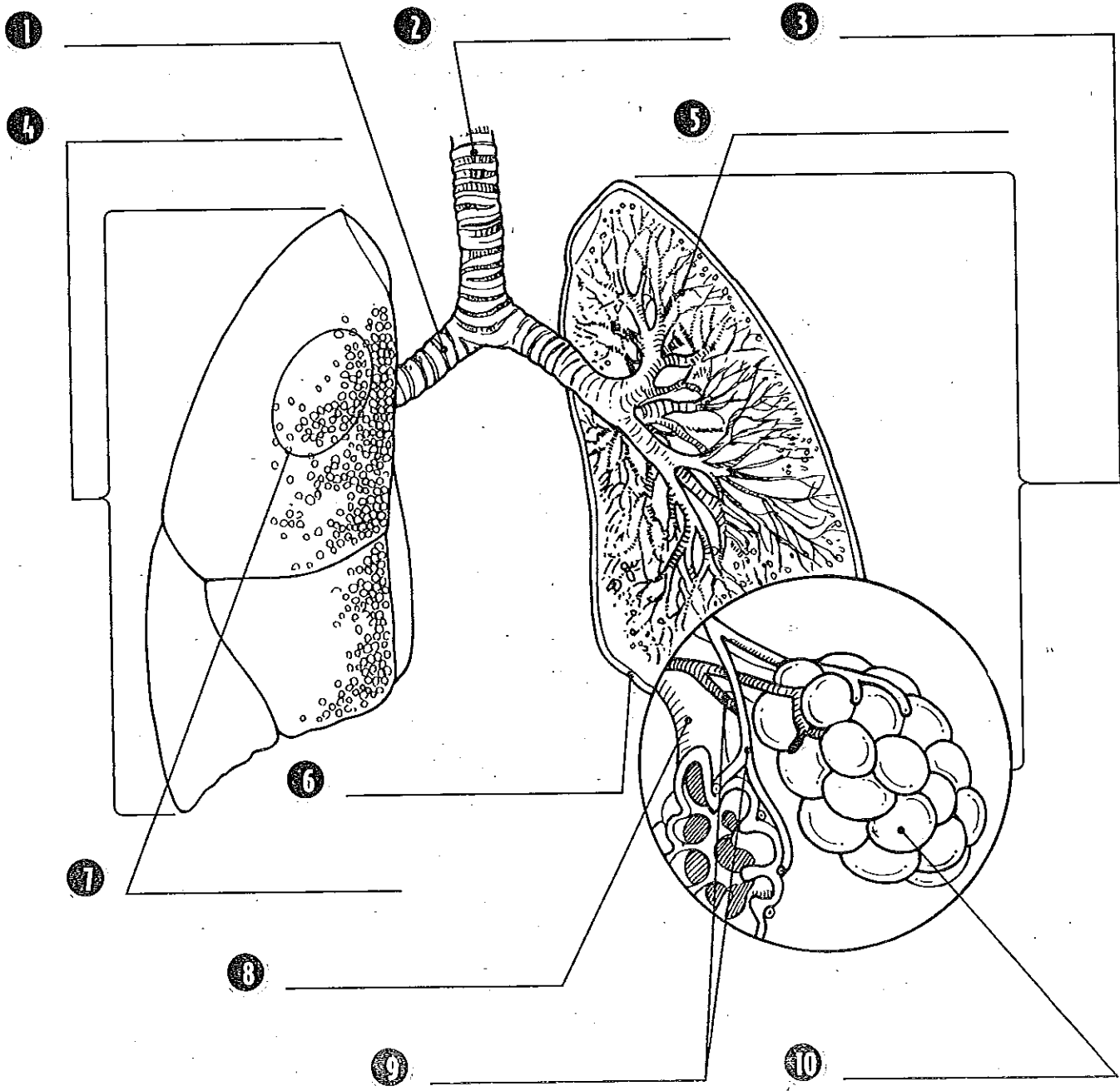
Directions: Complete the cycle diagram to show the process of breathing.



# The Lungs

The lungs are the main organ of the respiratory system. They are large spongy organs that fill a large part of the chest cavity. At birth the lungs are pink, but over time they become gray and mottled from tiny particles we breathe in with the air. Use the terms in the word box to label the diagram.

- |         |                |            |             |              |
|---------|----------------|------------|-------------|--------------|
| trachea | pleura         | bronchiole | right lung  | left lung    |
| lobe    | bronchial tube | alveoli    | capillaries | alveolar sac |



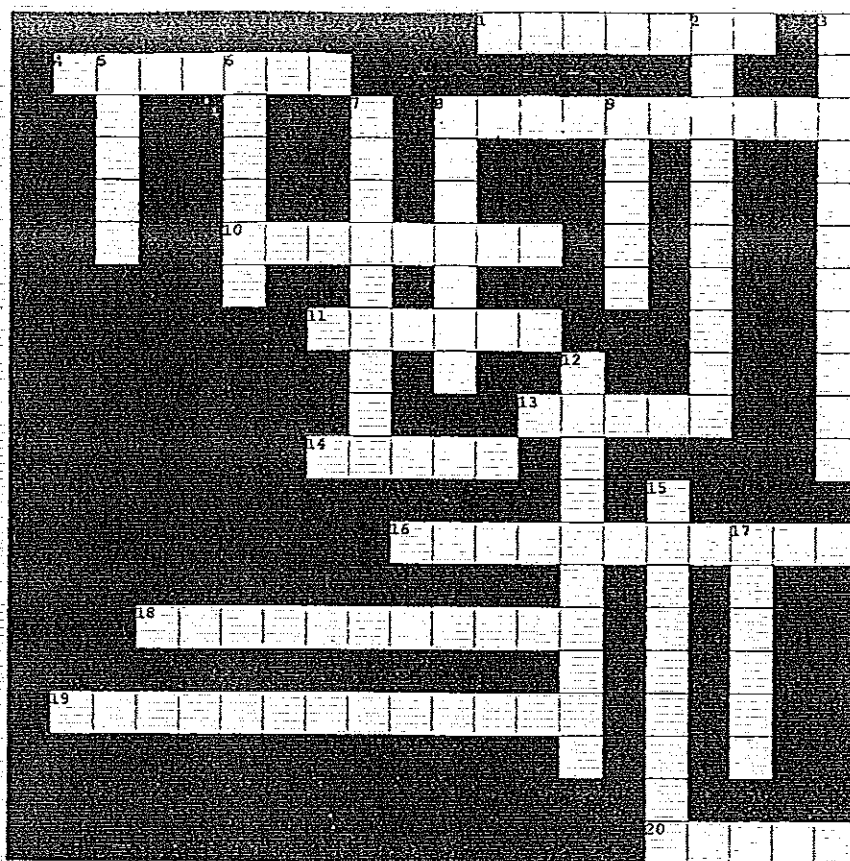
**FOCUS QUESTIONS**  
**The Respiratory System: Intake and Exhaust**

1. What are the two main parts of the Respiratory System?
2. What are the two meanings of respiration?
3. What is internal respiration?
4. Where does gas exchange take place inside the body?
5. What are the two main breathing muscles?
6. How many alveolar sacs are in the body?
7. If you were to smooth out the alveolar sacs, how much land would they cover?
8. Where is the main intake of air take place?
9. What warms air inside the nose?
10. Besides warming air, what other things does the nose do?
11. How long is your trachea? How wide?



12. What is at the end of the bronchi?
13. What are the lungs divided by?
14. Why is the left lung smaller?
15. What is the leading cause of accidental death?
16. What can happen if there is no intervention during choking?
17. How long can someone choke before brain damage sets in?
18. How do you help a choking victim?
19. What is the universal sign for choking?
20. What can happen if the Heimlich is performed incorrectly?
21. When would you perform CPR?
22. What are the two things you need to check before giving CPR?

## RESPIRATION CROSSWORD



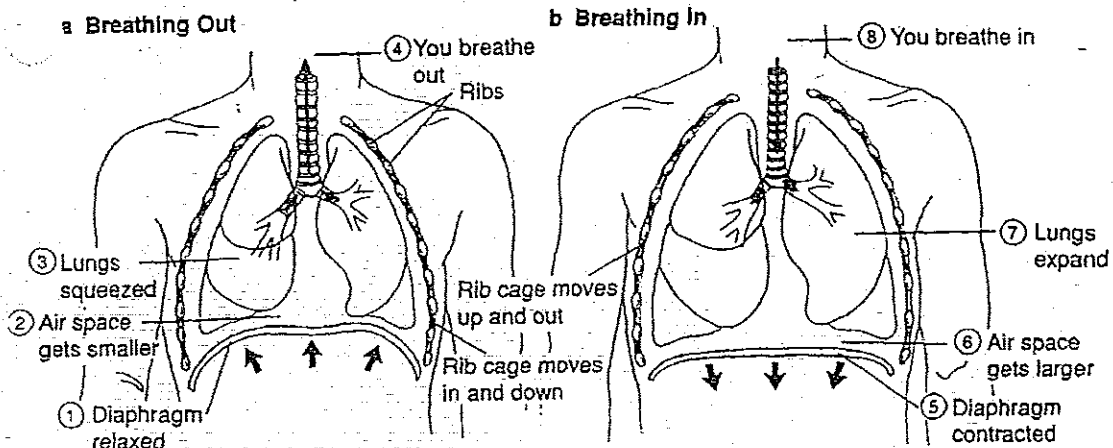
### ACROSS

- 1 pipe covered with rings of cartilage
- 4 where gas exchange occurs between lungs and blood
- 8 infection of the bronchial tubes
- 10 what gases do in the alveoli
- 11 bronchial tubes contract and block air flow
- 13 sticky material in nasal passages that traps unwanted materials
- 14 trap dirt and dust
- 16 small branches of bronchi
- 18 adding oxygen to glucose to get energy
- 19 waste removed by lungs
- 20 alternative entrance for air into respiratory system

### DOWN

- 2 flap of tissue that covers trachea when swallowing
- 3 warms, moistens, and contains mucus to trap unwanted materials
- 5 sponge-like organs containing alveoli
- 6 gas needed for energy
- 7 disease where alveoli lose ability to expand and contract
- 8 branches of trachea leading to lungs
- 9 microscopic hairs that move unwanted materials out of respiratory system
- 12 leading cause of cancer death in the US
- 15 muscle under lungs that controls breathing
- 17 voice box

# Breathe *IN*, Breathe *OUT*



**Directions:** Match each function in the column on the left with the correct structure in the column on the right.

- |   |               |
|---|---------------|
| 1. _____ muscle that causes your chest to expand when you breathe                         | A. nose       |
| 2. _____ main organ of the respiratory system   | B. epiglottis |
| 3. _____ place where oxygen and carbon dioxide are exchanged between air and blood        | C. trachea    |
| 4. _____ branching tube that carries air into lungs                                       | D. larynx     |
| 5. _____ warms, moistens and filters air coming into The respiratory system               | E. vocal cord |
| 6. _____ structure that enables you to speak  | F. lung       |
| 7. _____ tube that provides a passageway for air  | G. bronchus   |
| 8. _____ directs air down the respiratory path and food and water down the digestive path | H. alveolus   |
| 9. _____ one of two structures that vibrates, producing sound                             | I. diaphragm  |

# When Lungs Break Down

The respiratory system can be damaged from exposure to bacteria, viruses, and injury. It can also be damaged, sometimes with deadly consequences, by the choices humans make. The effects of smoking result in many of the diseases on this list. Match each lung condition in the word box to its description.

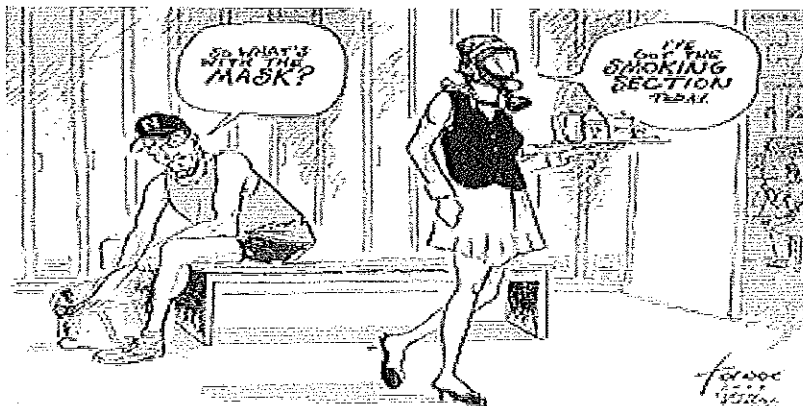
bronchitis	emphysema	asthma	lung cancer
smoker's cough	pneumonia	pneumothorax	pulmonary edema
pulmonary embolism			

- 1 \_\_\_\_\_ A disease caused by inflammation of the mucus membranes inside the bronchial tubes.
- 2 \_\_\_\_\_ The deadliest of lung diseases, a disease where abnormal growth of cells prevents normal lung function.
- 3 \_\_\_\_\_ This is an inflammation of the lungs most often caused by bacteria or viruses.
- 4 \_\_\_\_\_ This happens when a blood clot or other foreign substance gets stuck in the lungs and blocks a pulmonary artery.
- 5 \_\_\_\_\_ When a lung collapses, usually due to injury, it is called this.
- 6 \_\_\_\_\_ This disease, often caused by smoking, happens because the alveoli are destroyed. This results in labored breathing.
- 7 \_\_\_\_\_ A build-up of excessive fluid in the lungs leads to this condition.
- 8 \_\_\_\_\_ Often triggered by allergies, this disease causes a constriction of the air passageways, labored breathing, and coughing.
- 9 \_\_\_\_\_ This is a persistent hacking cough resulting from a build-up of mucus in the lungs, the body's reaction to cigarette smoke.

# SMOKING: From the Inside Out....

**DIRECTIONS:** Match the following descriptions to the appropriate term.

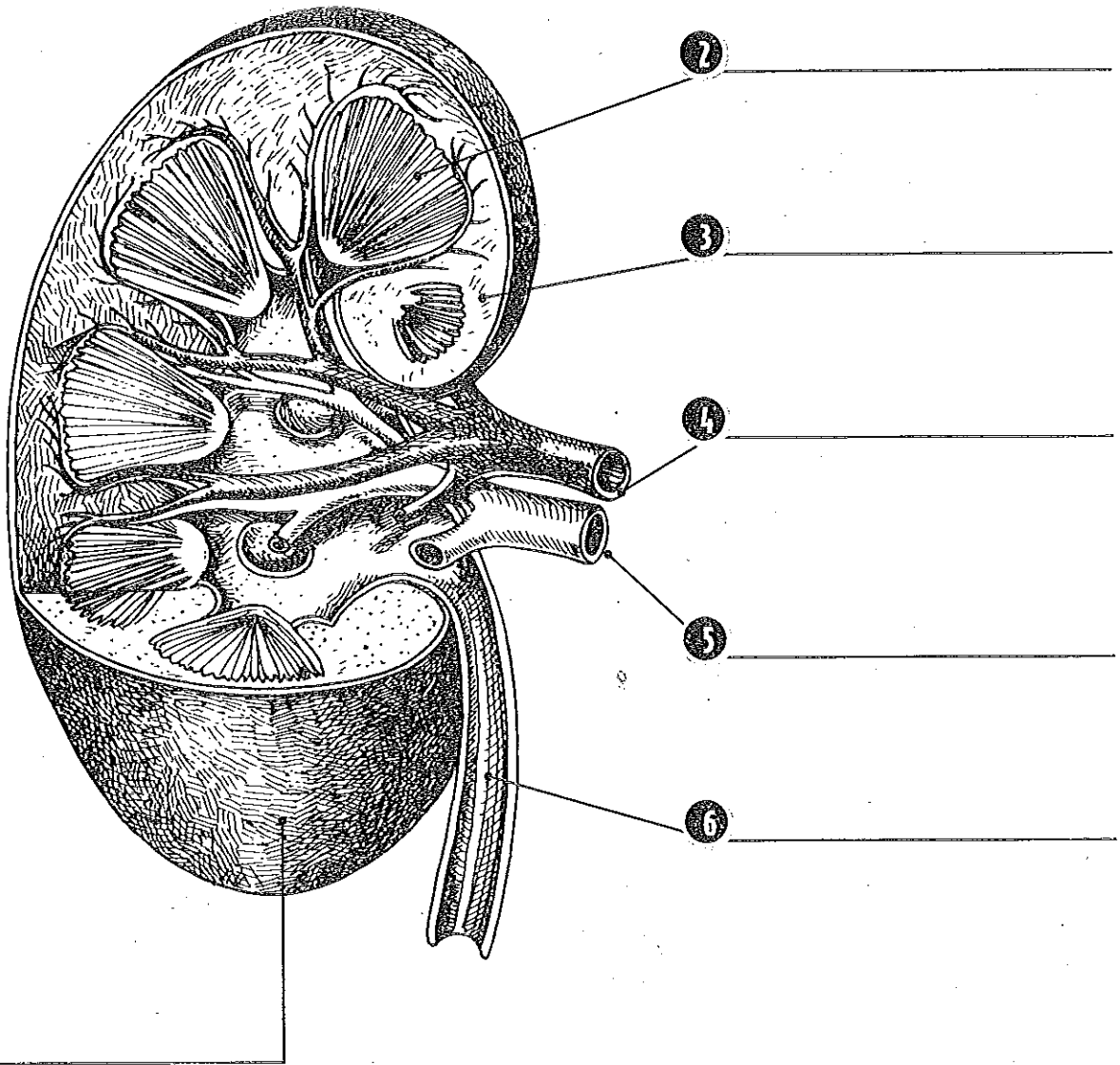
- |   |                  |
|---|------------------|
| _____ 1. Tube which delivers air from the voice box into the lungs  | a. blood vessels |
| _____ 2. Tiny cells that are killed when a person smokes  | b. nerve cell    |
| _____ 3. Tiny sacs that break when a person smokes, causing a disease called emphysema                      | c. windpipe      |
| _____ 4. Special cell that works faster when a person smokes; causes other parts of the body to work faster | d. heart         |
| _____ 5. Tubes which carry blood to all parts of the body; they become very stiff after a person smokes.    | e. nicotine      |
| _____ 6. A type of drug; a stimulant.   | f. bronchioles   |
| _____ 7. Tiny tubes that have air sacs at one end; become filled with dirty mucus when a person smokes.     | g. alveoli       |
| _____ 8. A muscle that pumps blood throughout the body; is overworked when a person smokes.                 | h. cilia         |
| _____ 9. A plant that can be burned, chewed or sniffed so that the drug in it can affect the body.          | i. tobacco       |
| _____ 10. When this tube swells as a result of smoking, the disease is called bronchitis.                   | j. bronchi       |



# Two of a Kind

The kidneys are organs that filter water, minerals, organic wastes, and other waste substances out of the blood. The human body contains two kidneys. These bean-shaped organs are about as big as a fist. Use the terms in the word box to label the diagram.

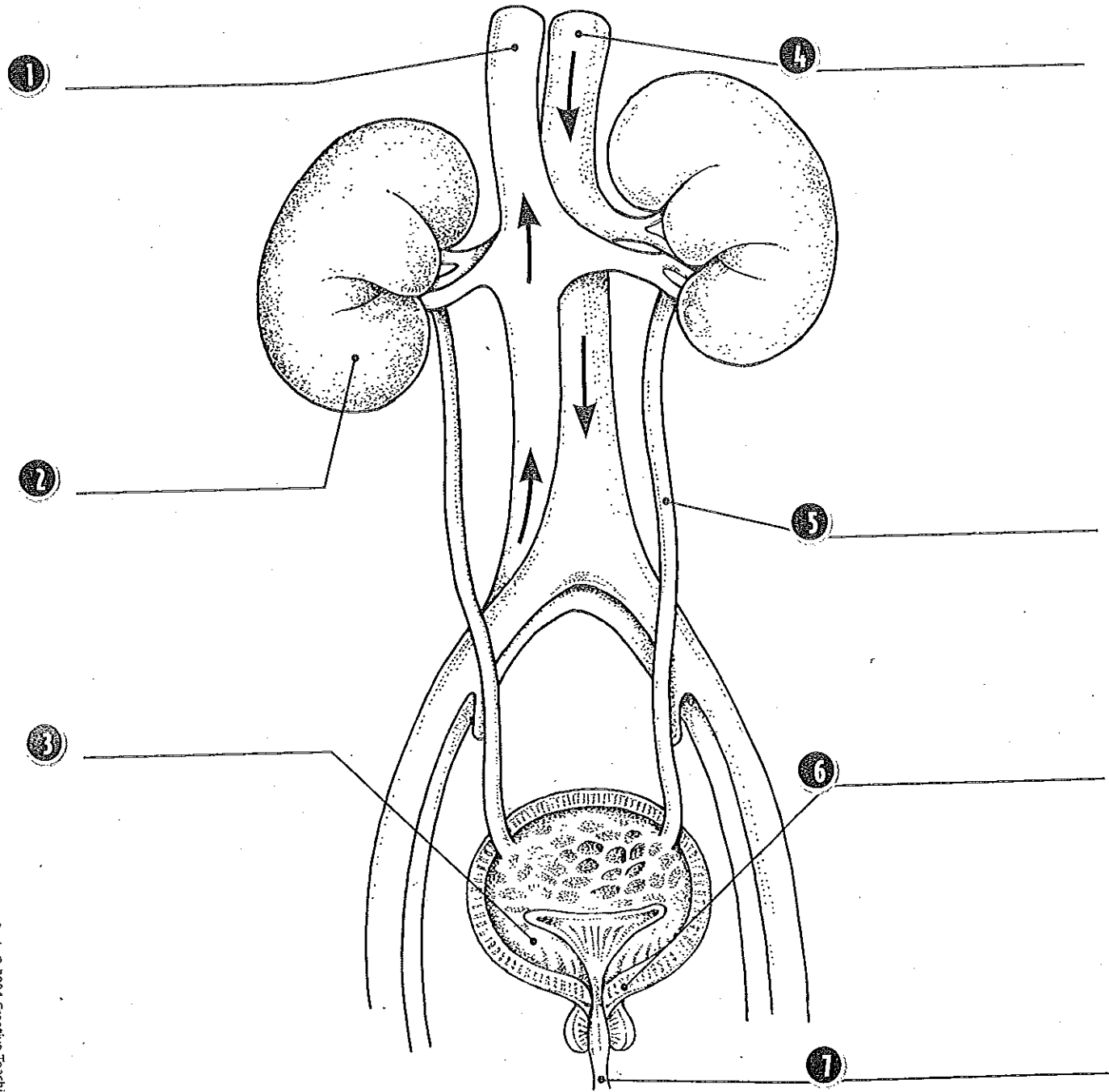
renal artery    renal vein    ureter    renal capsule    kidney medulla    kidney cortex



# The Urinary System

The human body needs water to survive. The urinary system makes sure the body does not have too much or too little fluid at any given time. Use the terms in the word box to label the diagram.

vein    kidney    muscle    bladder    ureter    urethra    artery



# Maintaining a Balance of Fluids

Humans continually gain and lose water and dissolved substances called solutes. The urinary system maintains the proper level of fluid and solutes in the body at all times. Match each term in the word box to its description.

interstitial fluid  
kidney stones

urine  
dialysis

extracellular fluid  
thirst behavior

hypertension  
blood

1

\_\_\_\_\_ When the amount of fluid in the blood drops and the level of solutes rises, this response is triggered to seek out water.

2

\_\_\_\_\_ A fluid that transports substances to and from all tissues by way of the circulatory system.

3

\_\_\_\_\_ A fluid formed when the kidneys filter water and solutes from the blood. The excess water and solutes remains as this fluid.

4

\_\_\_\_\_ The fluid that is found in the spaces between cells and tissues.

5

\_\_\_\_\_ Hard deposits of uric acid, calcium salts, and other wastes that can become lodged in the ureter or urethra and block urine flow.

6

\_\_\_\_\_ All of the fluid not inside cells, it includes plasma and interstitial fluid.

7

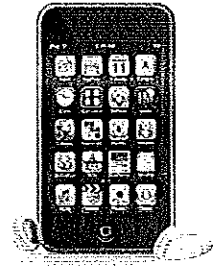
\_\_\_\_\_ The filtering of fluids with a machine to remove and add solutes in proper concentration. This process is used when kidneys fail to function on their own.

8

\_\_\_\_\_ Abnormally high blood pressure that can happen when the amount of sodium in the body becomes too great.



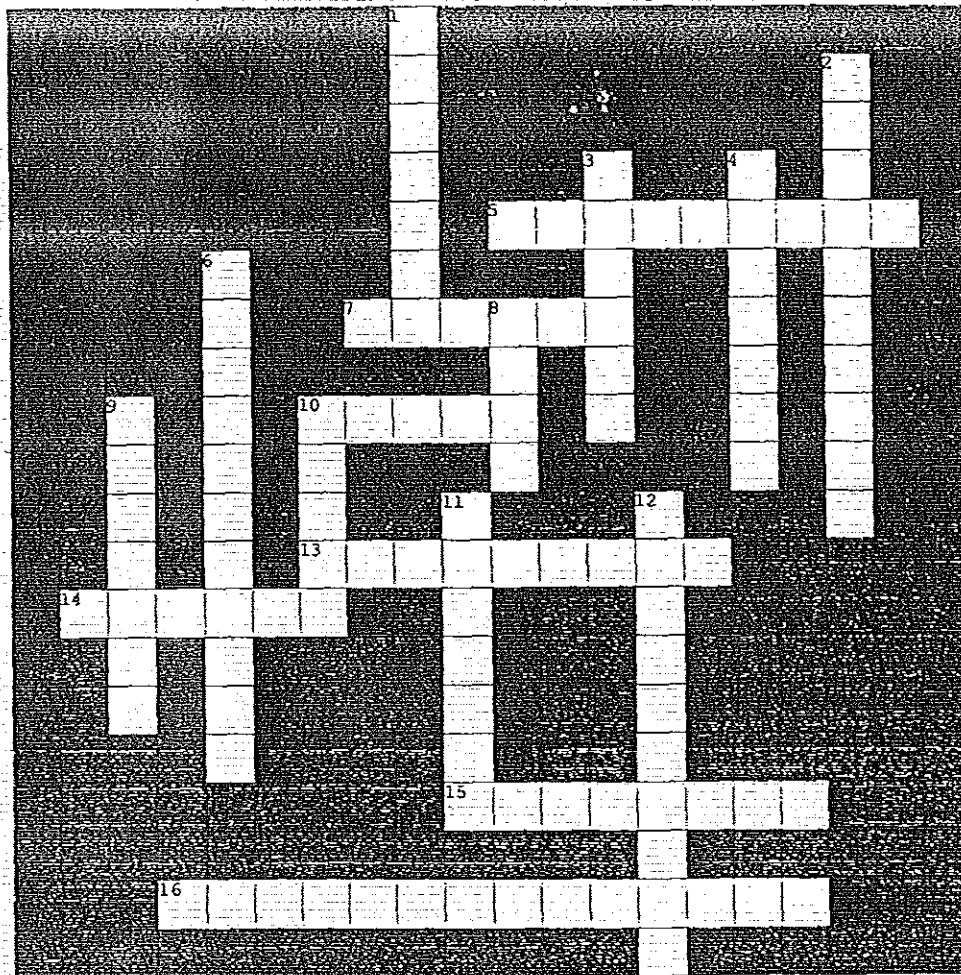
## ITOUCH ACTIVITY: EXCRETORY SYSTEM



**Directions:** Use the I-Touch to answer the following questions. Click on the "Anatomy 3D" application, then click on "Encyclopedia" and "Excretory System" (Urinary).

1. What are 3 things that the system keeps in balance?
2. What is the type of waste removed from the blood?
3. What are the 2 main parts of the system?
4. What are the other 3 main parts of the system?
5. What is the primary function of the kidneys?
6. What are the secondary functions of the kidneys?
7. What are 2 products do the kidneys excrete?
8. What do the kidneys reabsorb?
9. What do the kidneys produce?
10. What is the function of the urinary bladder?
11. Which tubes enter the bladder?
12. Which tube exits the bladder?
13. What is the function of the urethra?
14. Is the urethra longer in a male or in a female?

## EXCRETION CROSSWORD



### ACROSS

- 5 large sheet of muscle that powers breathing
- 7 filters wastes from blood
- 10 contain alveoli
- 13 removal of waste materials
- 14 tube that carries urine to bladder
- 15 place for exchange of oxygen and carbon dioxide
- 16 stores urine

### DOWN

- 1 two main branches of trachea
- 2 closes over windpipe to prevent choking
- 3 voice box
- 4 tube that carries urine from bladder to outside of body
- 6 adding oxygen to glucose to get energy
- 8 where air is usually inhaled
- 9 small filtering unit inside kidney
- 10 forms urea
- 11 windpipe
- 12 vibrate to produce sound



## CHAPTER REVIEW

**Directions:** Unscramble the key terms from the chapter and then use the numbered letters to solve the riddle.

### Clues

1. It's the result of proteins breaking down.
2. They're tiny sacs of lung tissue.
3. It's an irritation of the breathing passages.
4. It's a tiny filtering factory in the kidneys.
5. It's a large muscle that helps you breathe.
6. It's a small tube through which urine leaves the body.
7. It's the voice box.
8. It's a dark substance and makes cilia clump together.
9. They're tiny, hairlike, and sweep mucus around.
10. It's an addictive chemical in tobacco smoke.
11. It's the major organ of the excretory system.

### Key Terms

- |            |       |
|------------|-------|
| euar       | _____ |
| 1          |       |
| vlelioa    | _____ |
| 2          |       |
| crtoibnsih | _____ |
| renhnop    | _____ |
| 4          |       |
| gahmdairp  | _____ |
| 5          |       |
| reahrut    | _____ |
| 6          |       |
| yraxnl     | _____ |
| 7          |       |
| rta        | _____ |
| 8          |       |
| alici      | _____ |
| 9          |       |
| tnocinei   | _____ |
| 10         |       |
| ydnkie     | _____ |
| 11         |       |

**Riddle:** What process releases energy from oxygen and glucose?

**Answer:** \_\_\_\_\_

1    2    3    4    5    6    7    8    9    10    11