Life Science

S7L2. Students will describe the structure and function of cells, tissues, organs, and organ systems.

e. Explain the purpose of the major organ systems in the human body (i.e., digestion, respiration, reproduction, circulation, excretion, movement, control, and coordination, and for protection from disease).

02/08/16-Agenda: **Respiration (pp.534-542)**

Human Body Summative Test this Friday

Learning Target: I know the organs and functions of the respiratory system, because . . .

Success Criteria: I can describe the structures that air passes through as it travels to the lungs and why this happens.

Warm up:

1. Which gases are involved when we breathe in (inhale) and out (exhale)?

2. Predict the percentage of each gas compared to the total volume.

Group Discussion

1.Compare your predictions w
members of your group.

2.How do your predictions vary?

Allow each group member to justify (explain with reasoning) their prediction.

M

Group Discussion

1.Compare your predictions w
other members of your group.

2. How do your predictions vary? What was the group average for each?

Allow each group member to justify (explain with reasoning) their prediction.

G−A

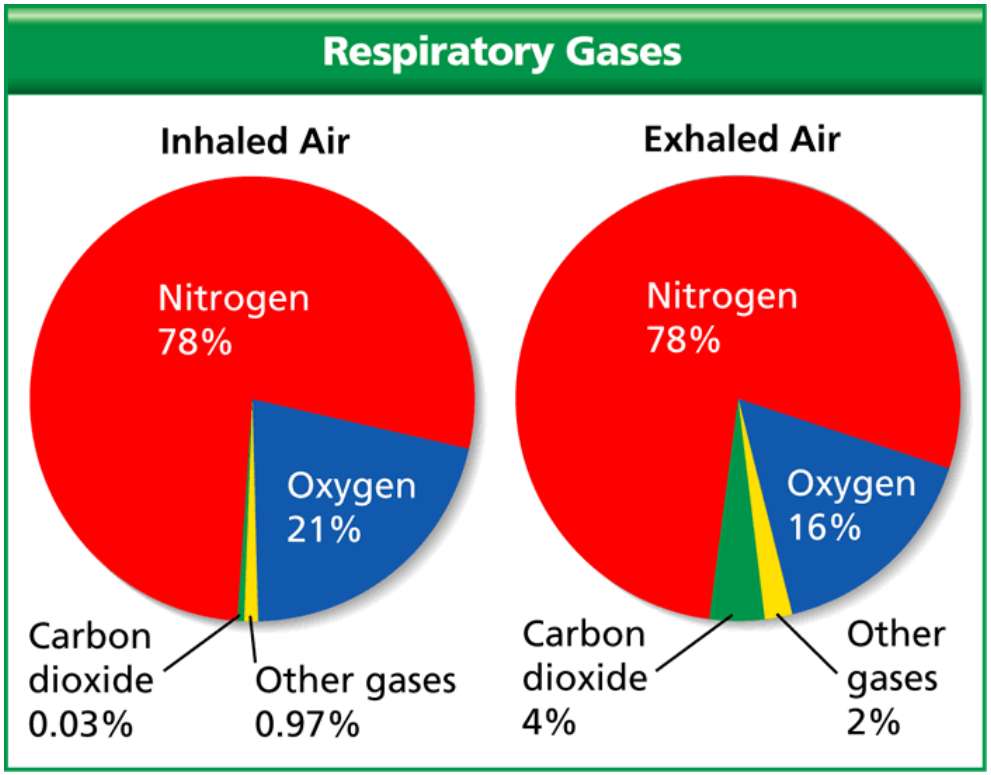
Examine the graph on the right (also on p. 535).

3. How were your group's prediction similar or different to the graph?

4. What does each wedge in the graphs represent?

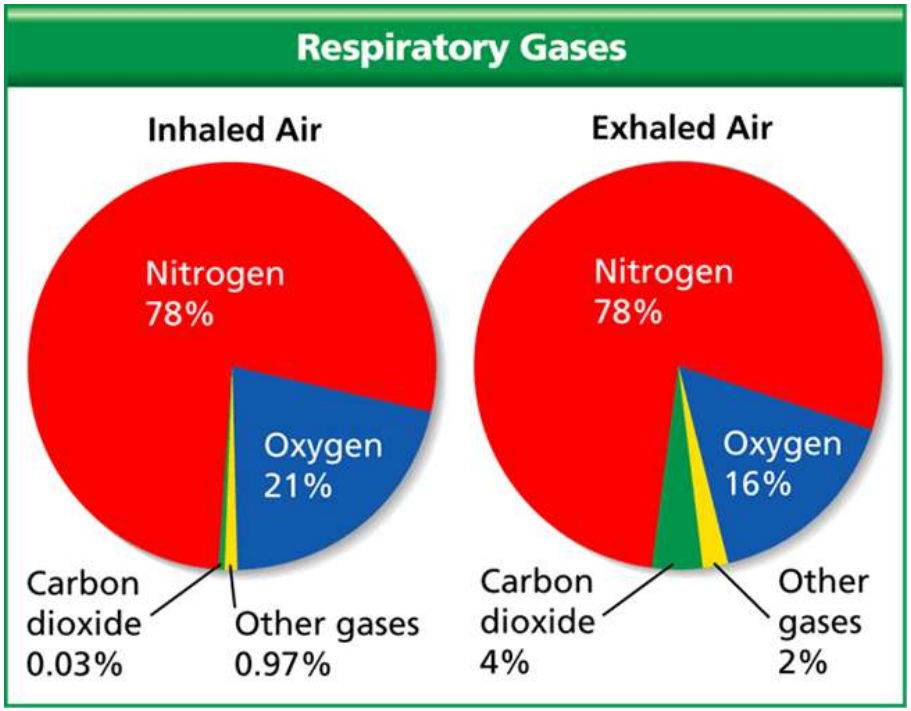
Percent of a gas breathed in or out.

5. Based on the data, which gas is used by the body? Explain.



Oxygen. Less oxygen is breathed out than is breathed in—meaning that some must have been used by the body.

Drawing Conclusions



6. Compare the percentage of carbon dioxide in inhaled air with the percentage in exhaled air. How can you account for the difference?

There is a higher percentage of carbon dioxide in exhaled air. Carbon dioxide is a waste product of cellular activity.

7. Explain why the percentage of nitrogen is the same in both inhaled air and exhaled air.

Nitrogen is not used by the body and is not a waste product.

Making the Connection to Cells

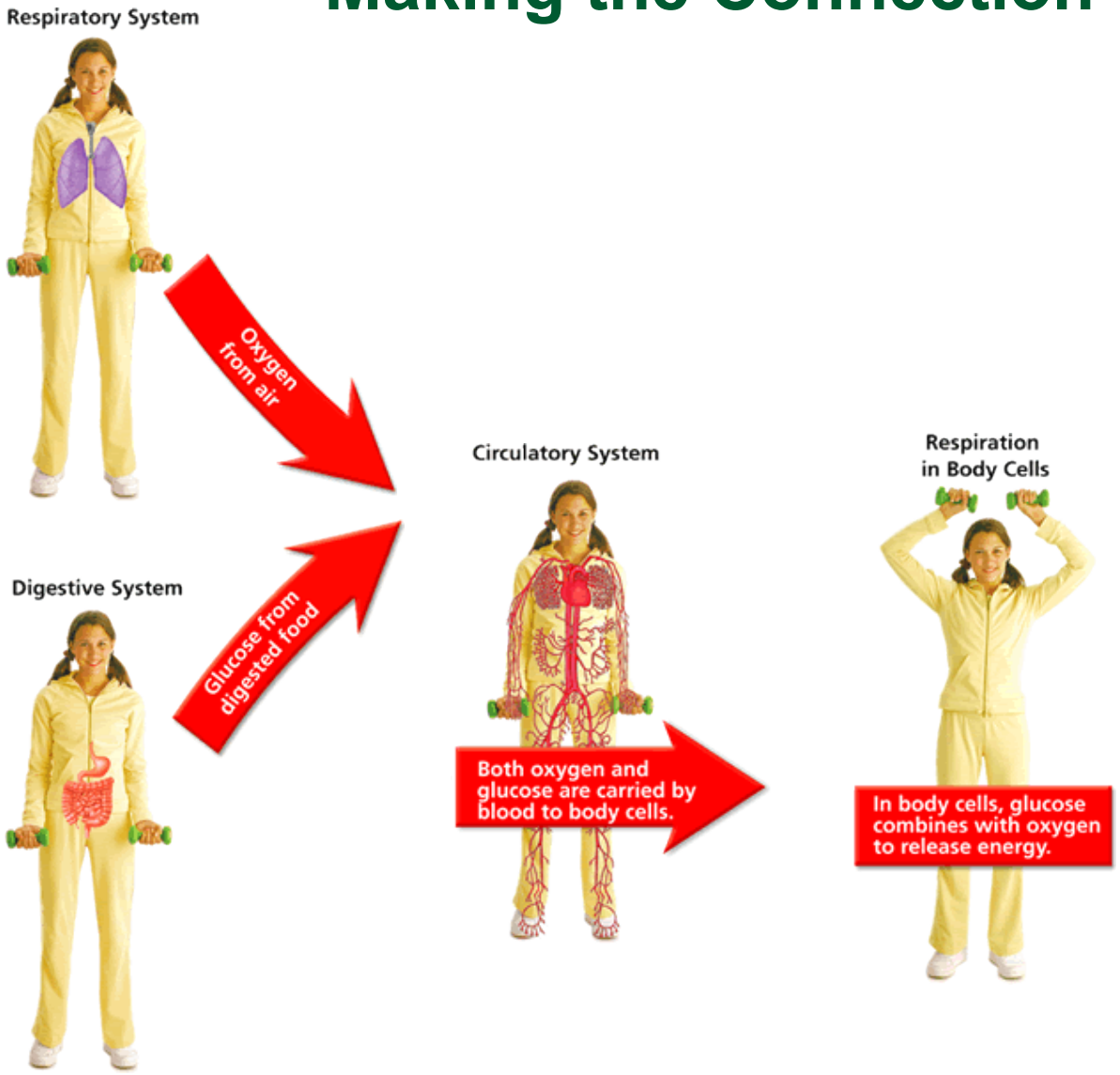
8.What are the 2 functions of the respiratory system?

Exchanging gases through diffusion; taking in O_2 (oxygen) and releasing waste, CO_2 (carbon dioxide) and H_2O (water).

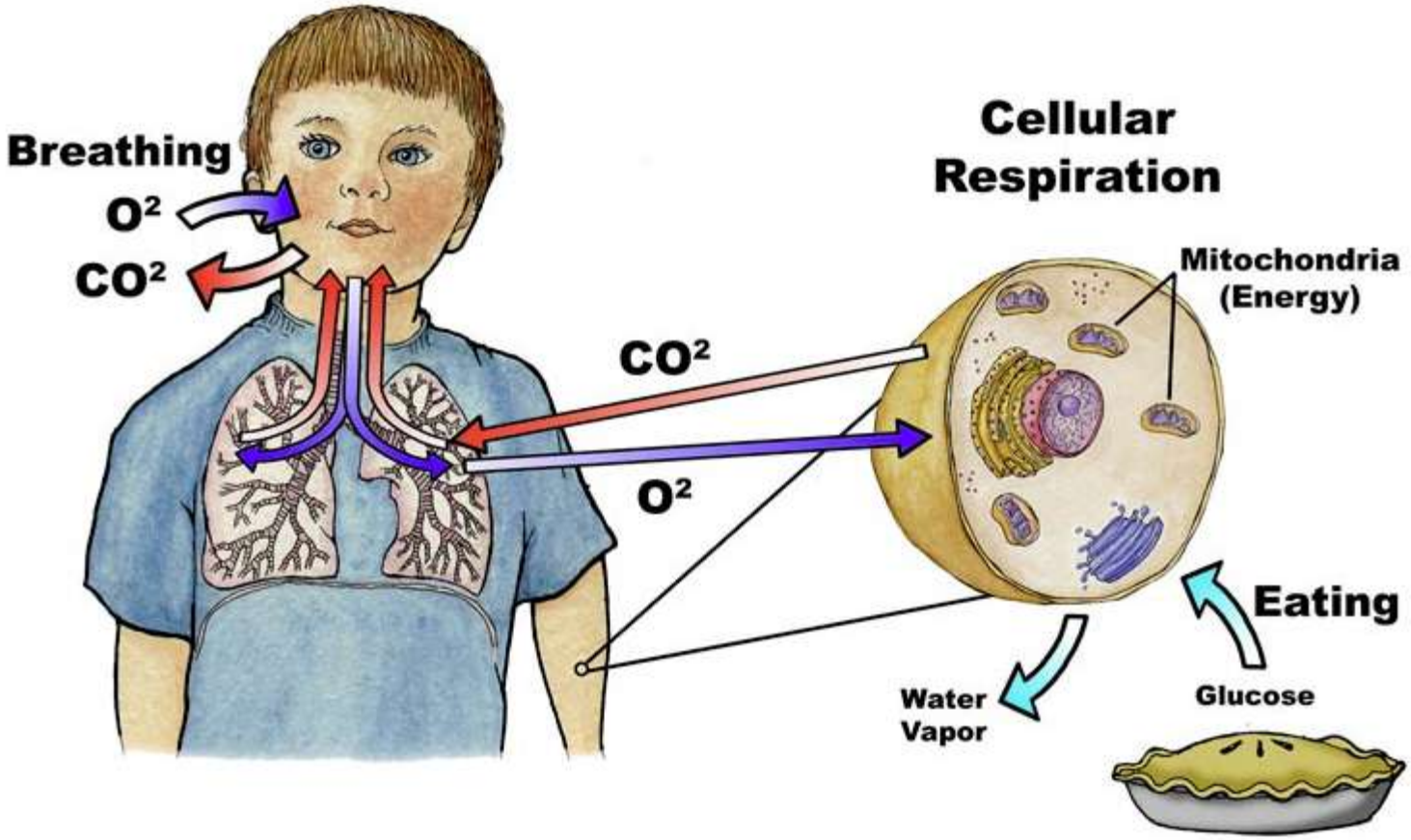
9. What cellular process does this function support?

Cellular Respiration

Making the Connection to Cells

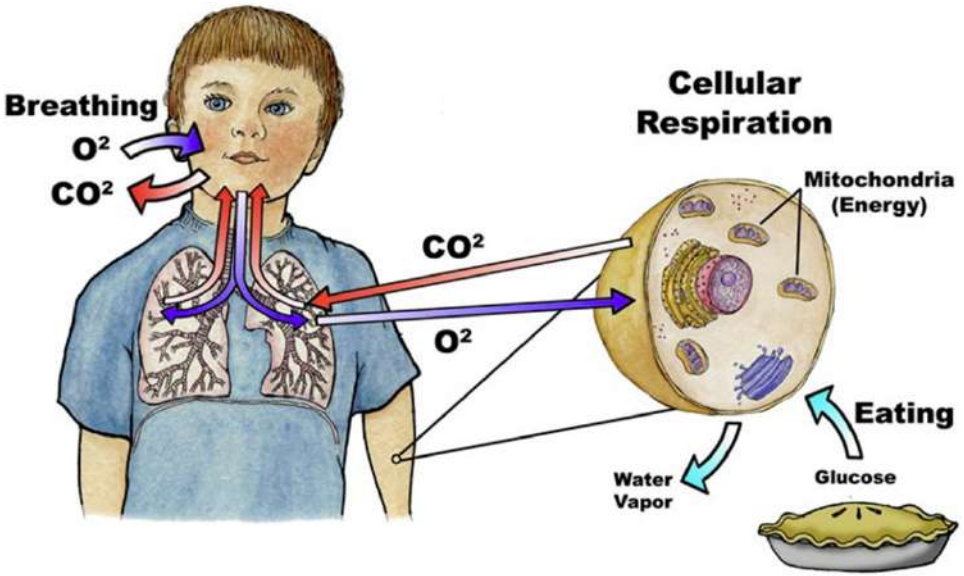


Respiration needs oxygen & glucose.

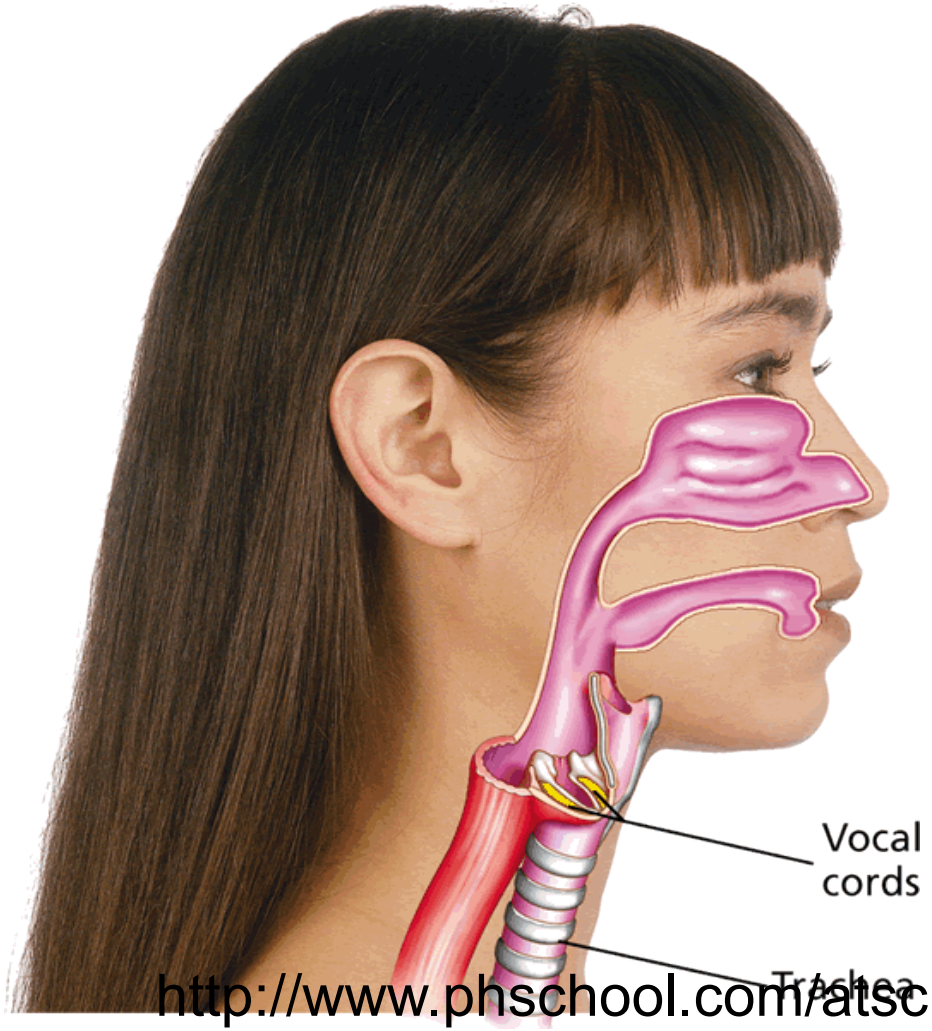


9. What cellular process does this function support?

Cellular Respiration



Organs of the Respiratory System

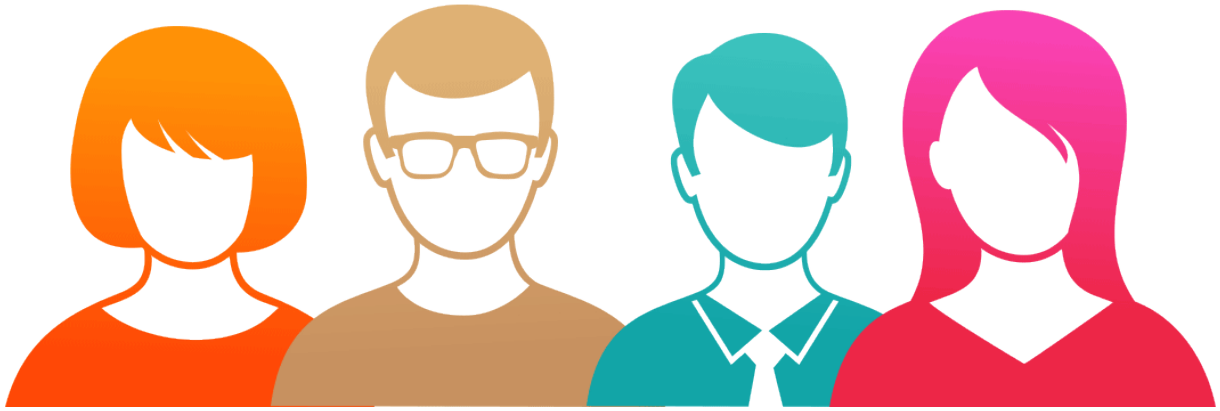


- The larynx, or voice box, is located at the top of the trachea.
- Your vocal cords are two folds of connective tissue that stretch across the opening of the larynx.
- The vocal cords vibrate when air passes over them. This produces the sound of your **voice**.

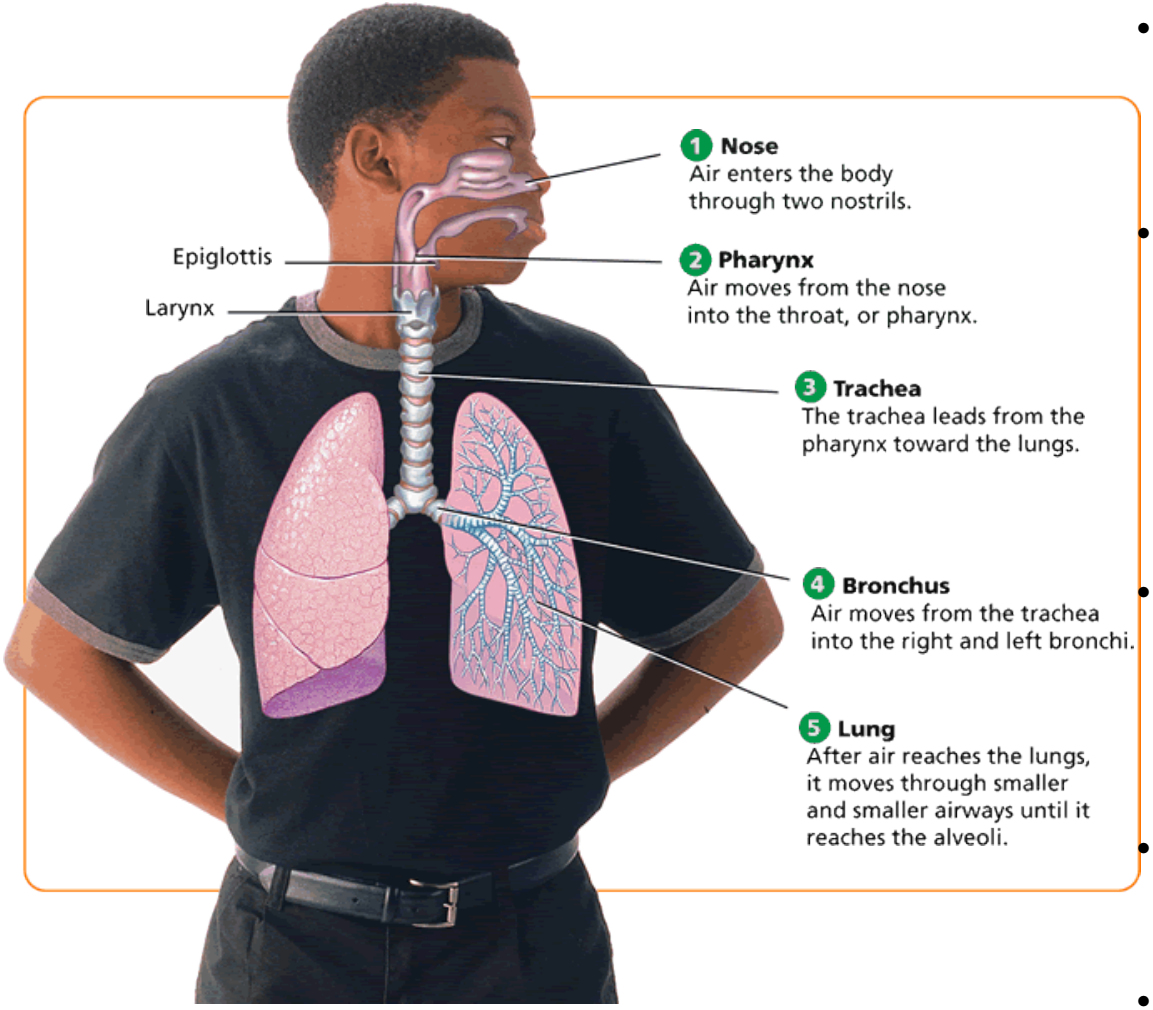
http://www.phschool.com/atschool/phsciexp/active_art/respiratory_system/index.html

10. How is the sound of your voice produced?

Muscles make the vocal cords contract. Air from the lungs rushes through the opening between them. The movement of the vocal cords makes the air vibrate to create a sound.



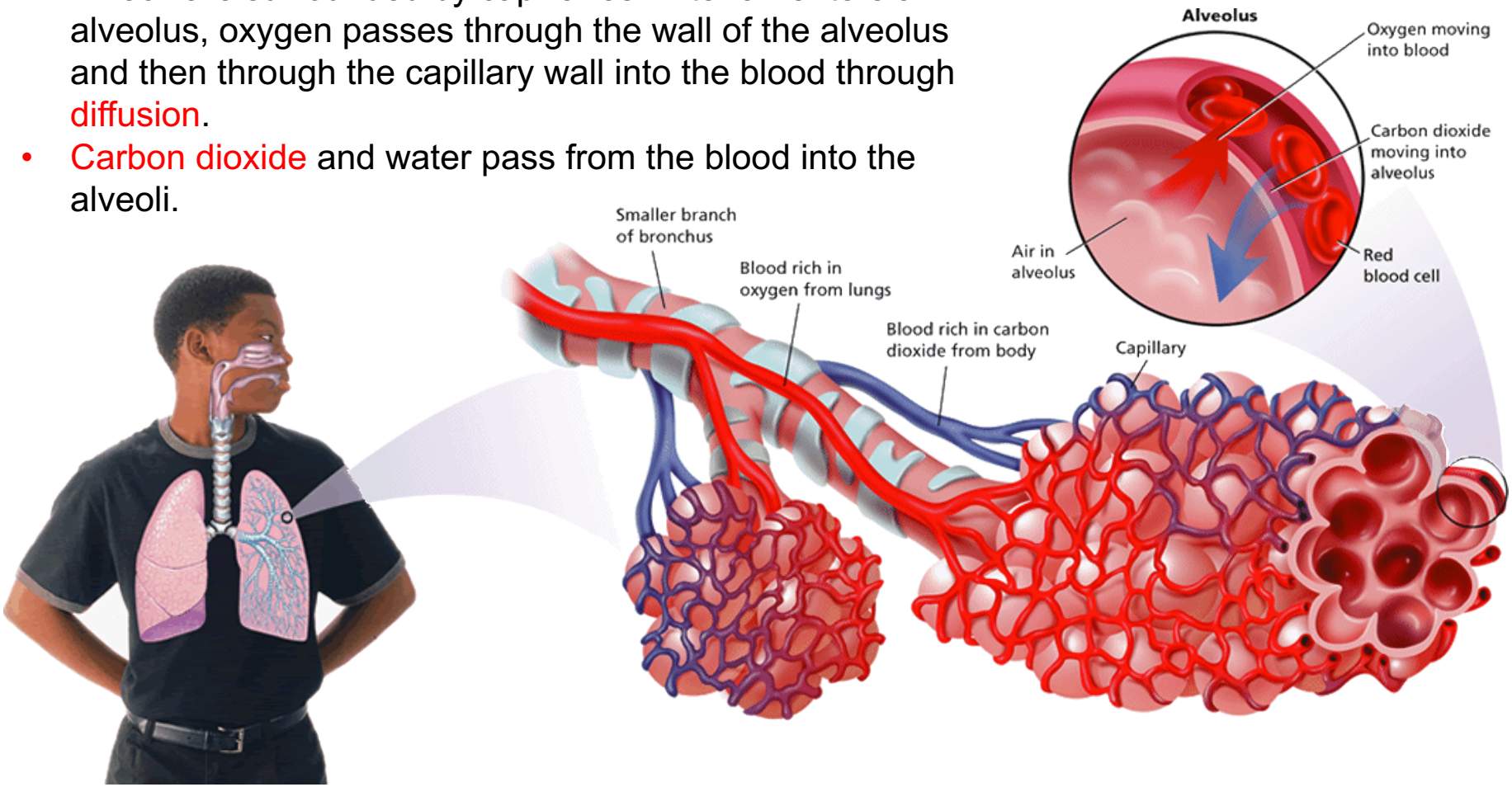
Organs of the Respiratory System

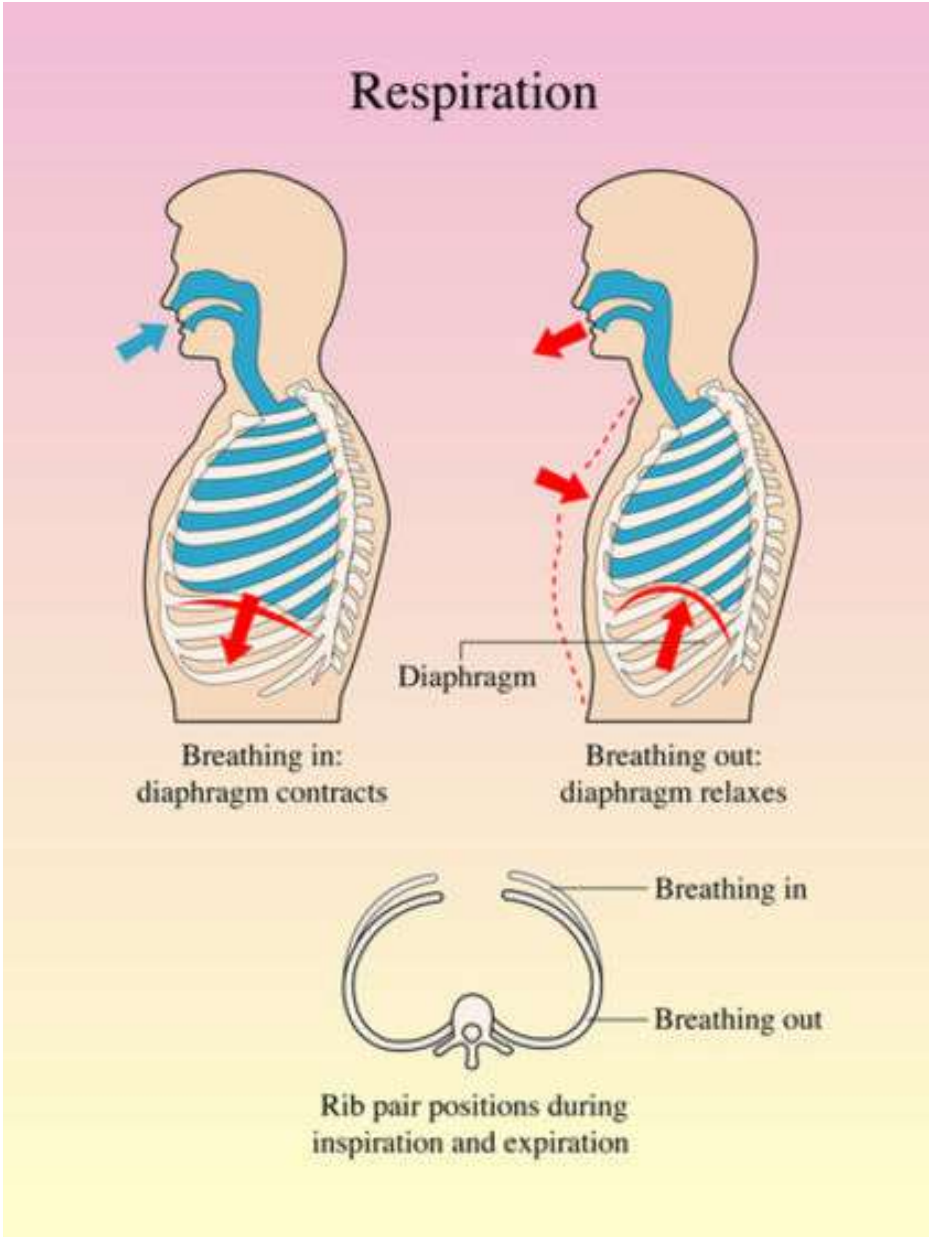


- Air moves from the nose downward into the throat, or pharynx (shared with the digestive system).
- The trachea, or windpipe, leads from the pharynx to the lungs. The walls of the trachea are made of rings of cartilage that keep it open and is covered by the epiglottis when eating.
- Air moves from the trachea into the bronchi (singular bronchus). The bronchi are passages that direct air into the lungs.
- The lungs are the main organs of the respiratory system.
- Inside the lungs, each bronchus divides into smaller and smaller tubes.

- At the end of the smallest tubes are bunches of alveoli (singular alveolus).
- Alveoli are tiny sacs of lung tissue specialized for the movement of gases between air and blood.

- Alveoli are surrounded by capillaries. After air enters an alveolus, oxygen passes through the wall of the alveolus and then through the capillary wall into the blood through diffusion.
- Carbon dioxide and water pass from the blood into the alveoli.



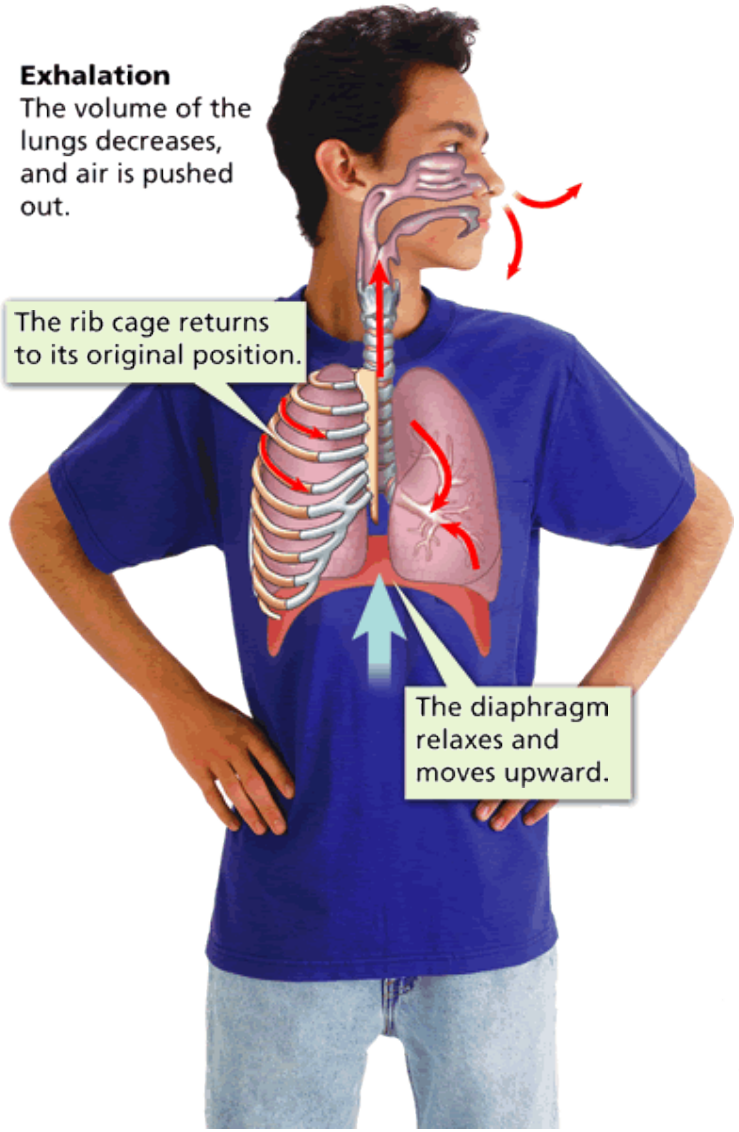


Organs of the Respiratory System

The diaphragm is a large, dome-shaped muscle at the base of the lungs.

When you breathe, the actions of your rib muscles expand or contract your chest, causing air to flow in or out.

Breathing


Exhalation
The volume of the lungs decreases, and air is pushed out.
The rib cage returns to its original position.
The diaphragm relaxes and moves upward.

Breathing Process Activity

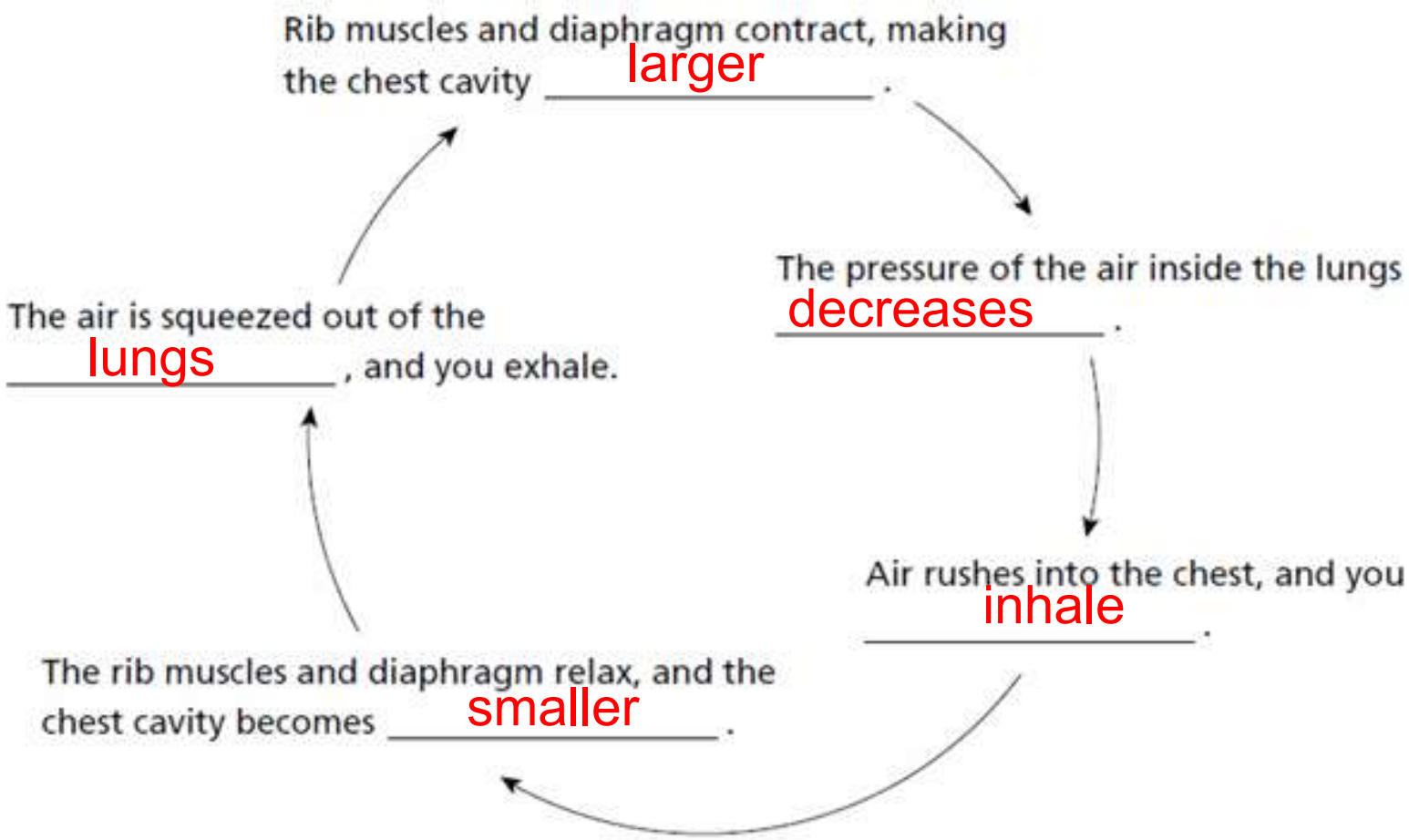
Click the Active Art button to open a browser window and access Active Art about the breathing process.

Breathing Demo

Directions: Page 543

11. How do you inhale and exhale?

Complete the cycle diagram to show the process of breathing.

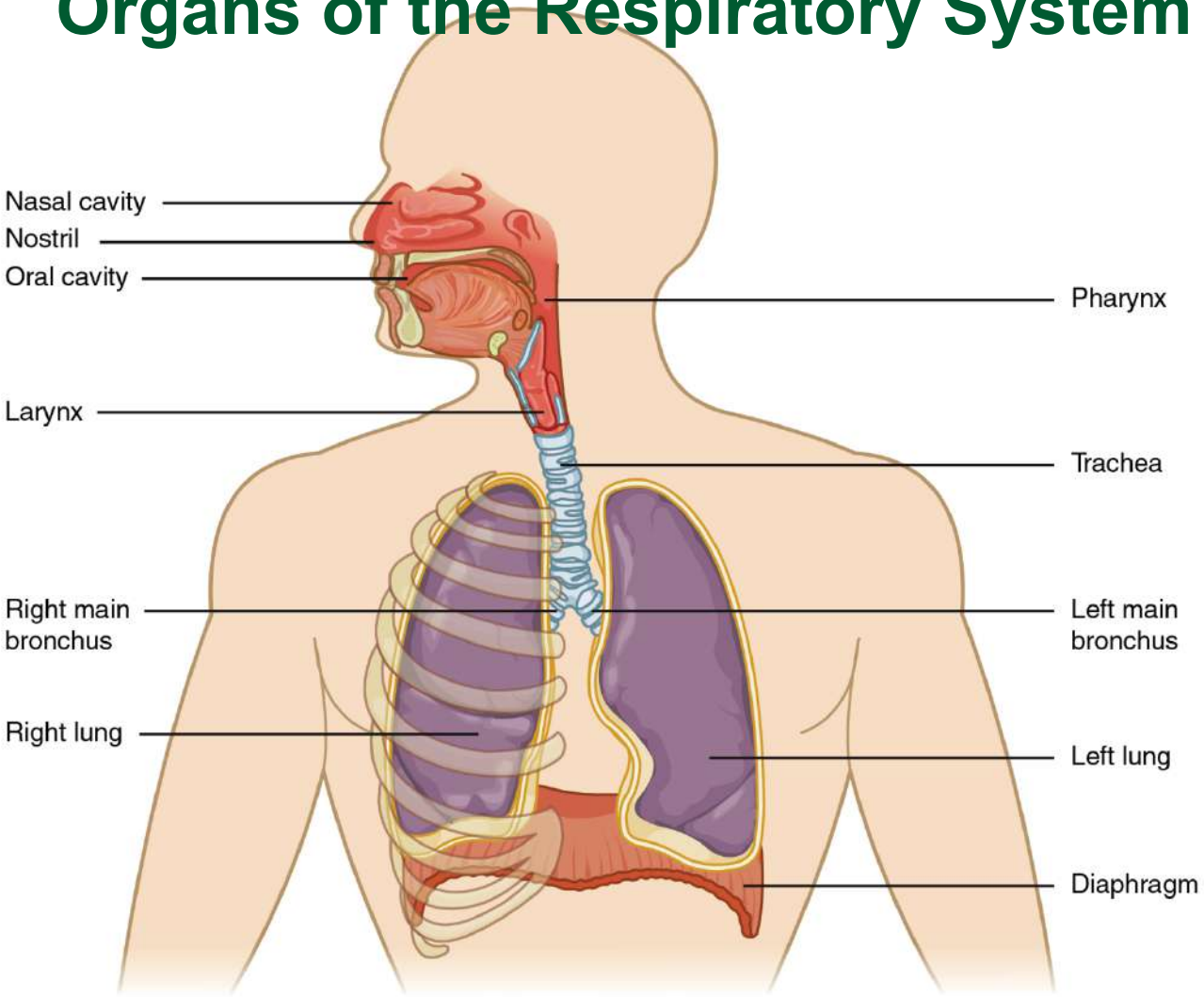


12. How does respiration differ from breathing?

Respiration is the process inside the cells where glucose is broken down using oxygen to produce energy.

Breathing is the process in which air flows into and out of the lungs.

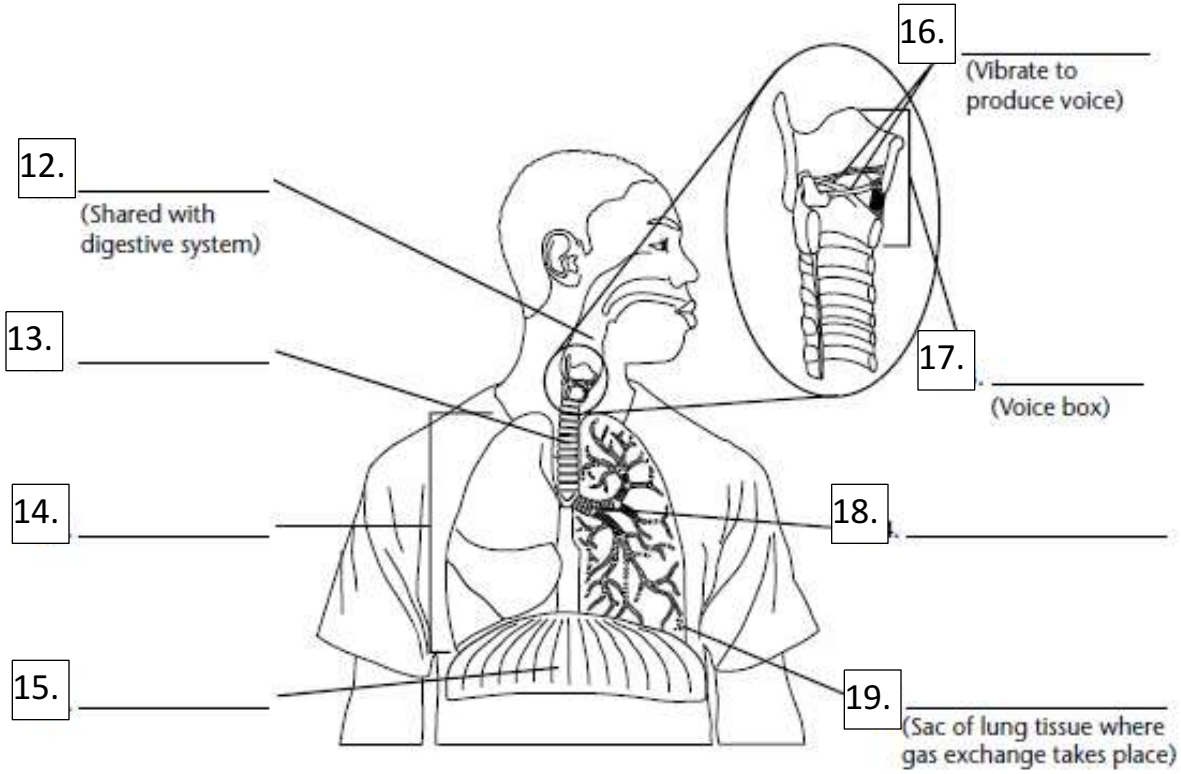
Organs of the Respiratory System



What are the structures and organs of the respiratory system?

Use p. 537

Label the diagram with the parts of the respiratory system.

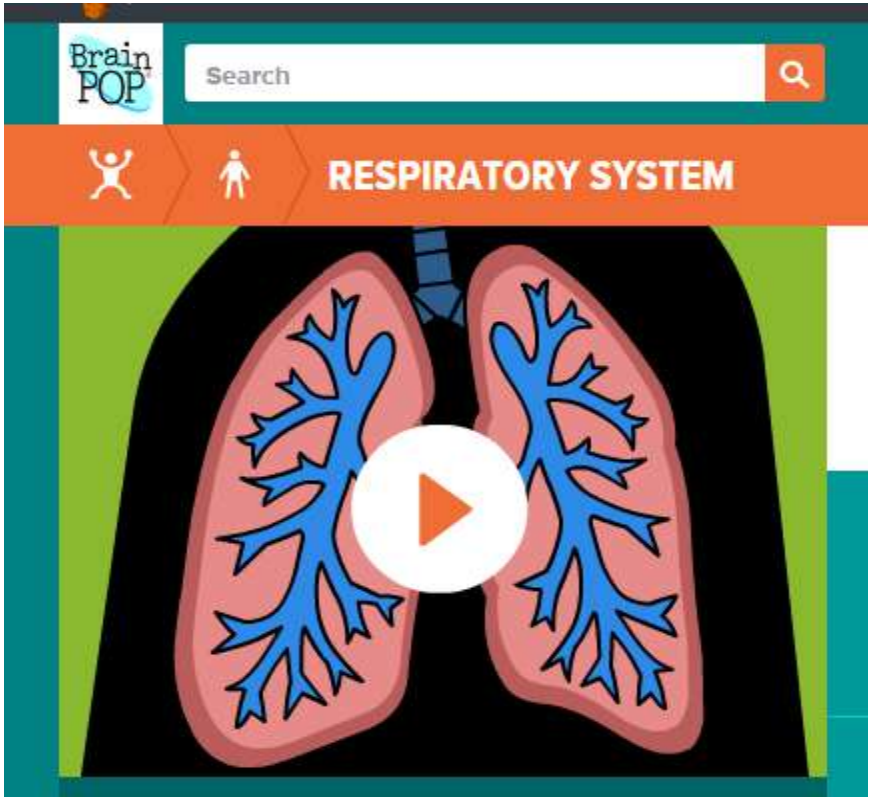


Answers:

12. pharynx
13. trachea
14. lung
15. diaphragm
16. vocal cords
17. larynx
18. bronchus
19. alveolus

Summarizing

https://www.brainpop.com/health/bodysystems/respiratorysystem/



FYI

How long can you stay underwater without coming up for air? Bet it's not as long as these other mammals! Of course, they spend lots of their time in the water, so it's not totally fair, but still. Here's a look at the average time that a number of species can hold their breaths.

- **Human:** 1 minute
- **Muskrat:** 12 minutes
- **Hippopotamus:** 15 minutes
- **Sea cow:** 15 minutes
- **Porpoise:** 15 minutes
- **Beaver:** 20 minutes
- **Seal:** Between 15 and 28 minutes, depending on the s
- **Greenland whale:** 60 minutes
- **Sperm whale:** 90 minutes
- **Bottlenose whale:** 2 hours

Closing

20. Describe the structures that air passes through as it travels to the lungs and why this happens.