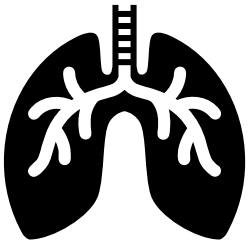
BIOMEDICAL ACTIVITY

Build a Respiratory System

BIOMEDICAL ENGINEERING

Materials

- three balloons (one big enough to stretch over bottle, two smaller ones)
- two plastic straws
- rubber bands
- 2 litre plastic bottle
- modelling clay



Original source link: teacherengineering.org

Preparation

- pre-drill two straw-sized holes into the bottle cap
- cut off the bottom of the bottle

Instructions

1. Review the primary respiratory system components with students. Use the Respiratory System Worksheet and ask students to label parts and describe their function.
2. Form groups of 2 and using their knowledge of the respiratory system ask students to construct their own basic, working model of the human respiratory system using the materials provided.
3. After construction of their model lungs, ask student to use their models to demonstrate what happens when the cavity fills up with air.

To construct the lung/diaphragm model:

a) Make two holes in the bottle cap (this should be predrilled for safety).
b) Cut the bottom off the bottle.
c) Stick two straws through the two holes in the bottle cap. The straws represent the larynx, trachea and bronchi.
d) Place a balloon on the end of each straw and secure with a rubber band. The balloons represent the lungs.
e) Feed the balloon ends of the straws through the top of the bottle and screw the lid on tightly.
f) Use the clay to secure the straws in place and prevent air from escaping.
g) Stretch out the larger balloon and place it over the bottom opening of the bottle. The larger balloon represents the diaphragm.

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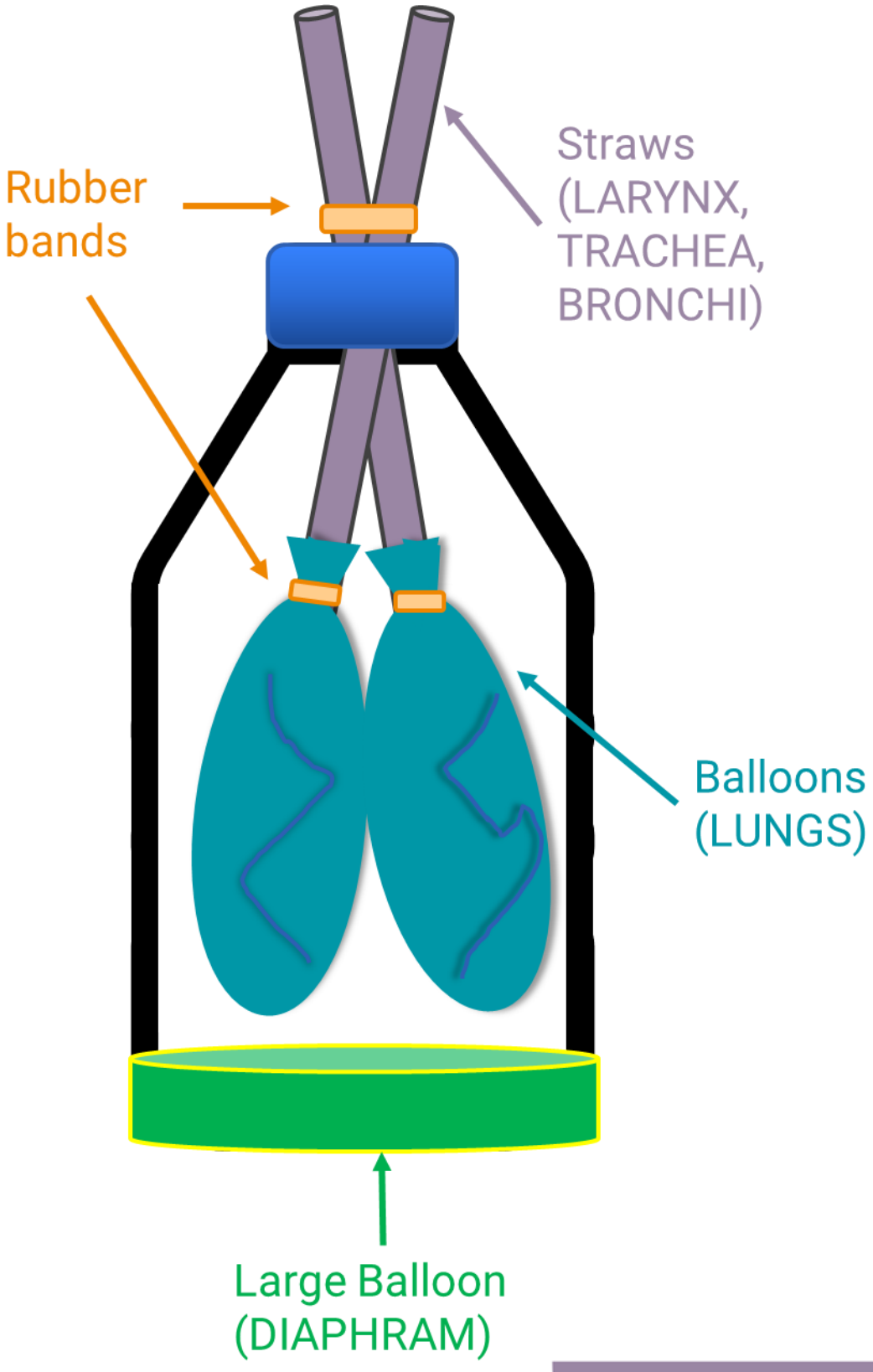
Build a Respiratory System

Example of a respiratory system model



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Questions

What happens when the diaphragm is pulled?
Pulling the diaphragm down, away from the lungs, inflates the lungs by making the chest cavity larger and decreasing the pressure.

What happens when the diaphragm is pushed?
Pushing the diaphragm in, towards the lungs, deflates the lungs by making the chest cavity smaller and increasing the pressure.

It is important that students see how air moving in and out of the lungs coincides with diaphragm movement.

Glossary

bronchi
two large tubes that carry air from the windpipe to the lungs. After the main bronchi, the tubes branch out into parts that look like tree branches.

bronchial tree
The trachea and the two bronchi make up the bronchial tree. It is the air system located within the lungs which brings air from the trachea to the lungs tiny air sacs called alveoli.

diaphragm
a muscle that help you to inhale and exhale, that is breathe in and out. It is a dome shaped muscle below your lungs and heart.

larynx
sits at the back of the throat, above the windpipe and contains the voice box. It prevents food and other items from entering the trachea and lungs.

trachea
also known as the windpipe, it is a tube made of cartilage which starts at the larynx and splits into two smaller tubes called the bronchi, which goes to each lung.

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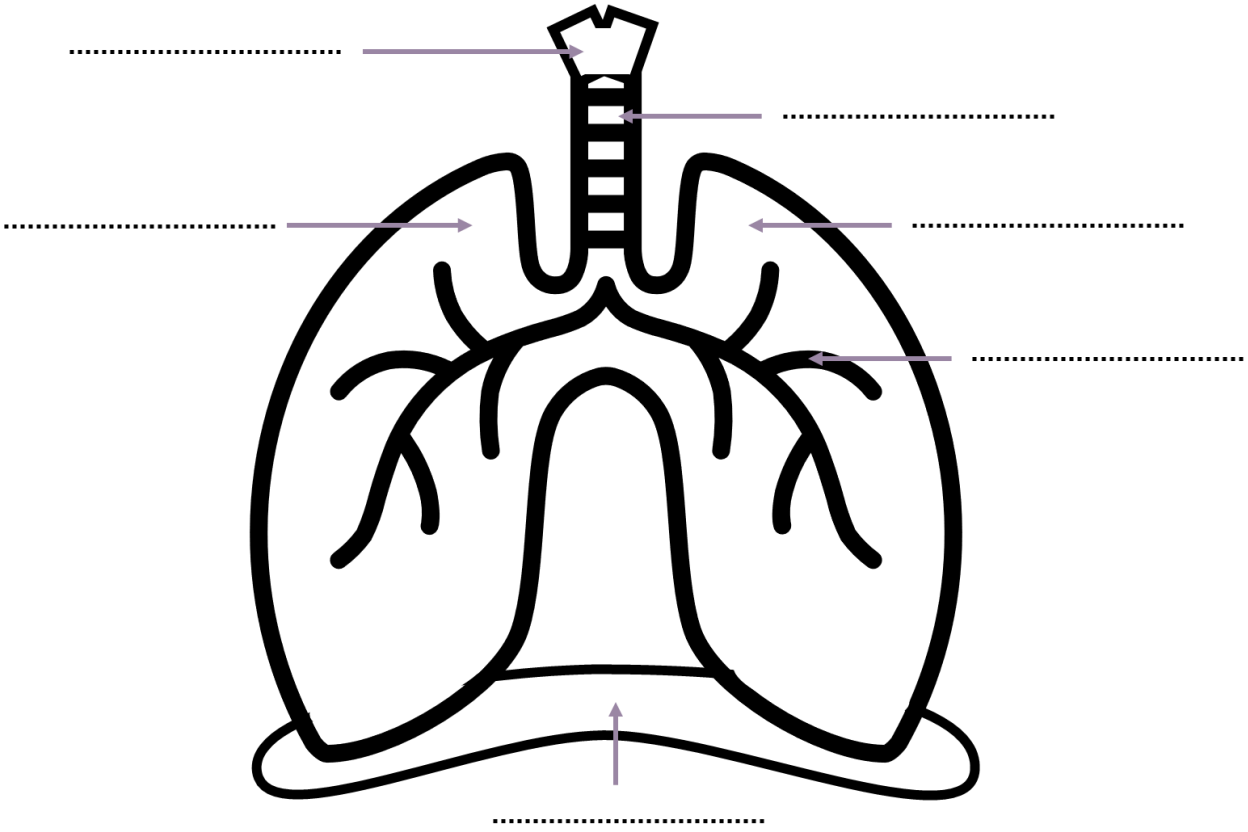
Respiratory System Worksheet

Name:_____



Label the above diagram using the following parts of the respiratory system.

- **larynx**
- **trachea (windpipe)**
- **right lobe**
- **left lobe**
- **bronchial tree**
- **diaphragm**

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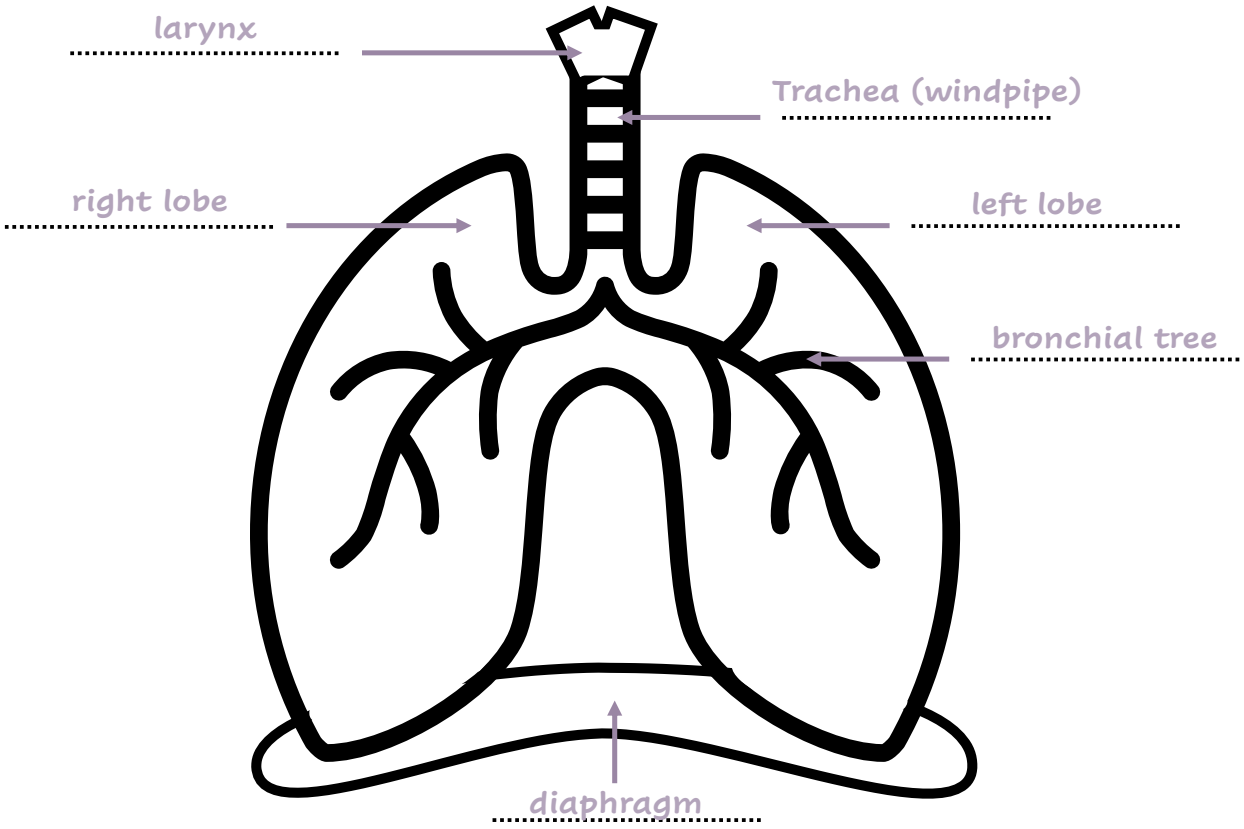
Respiratory System Worksheet Answers

Name:_____



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