respiratory system

Exhibition stations

RESPIRATORY SYSTEM
Station 2

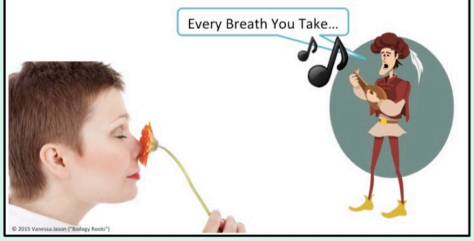
Primary Functions:

1. Supplies oxygen to our cells.
2. Removes carbon dioxide from our cells

(Carbon dioxide can be lethal if allowed to accumulate in our body).

Secondary Functions:

3. Filters particles such as dust and pollen from our airways.
4. Produces sound.
5. Participates in olfactory functions (smell).

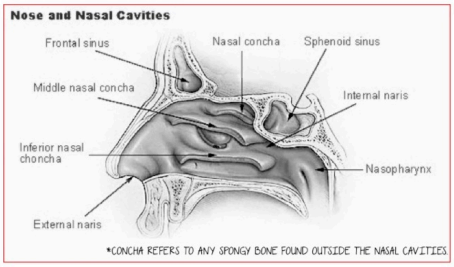


© 2015 Vanessa Jason ("Biology Roots")

RESPIRATORY SYSTEM
Station 4

Nasal Cavity

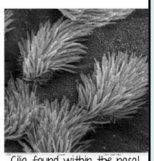
The nasal cavity is a large air-filled space above and behind the nose. Each nostril leads to its own nasal cavity.



The nasal cavity is lined with mucous membrane and tiny hairs called cilia.

The function of the nasal cavity is to:
- Provide an orifice for air to enter the body
- Moisten, warm and filter the air as it enters the body.

The nasal cavities lead to the nasopharyx, which is where the nasal passages meet the pharynx.


Cilia found within the nasal cavity

© 2015 Vanessa Jason ("Biology Roots")

RESPIRATORY SYSTEM
Station 7

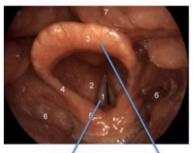
The Larynx

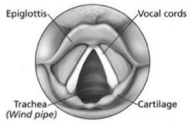
AKA THE VOICE BOX



The larynx is also known as the voice box. The larynx forms part of a tube in the throat that carries air to and from the lungs.
The main function of the larynx is to produce sound. It is primarily made up of muscles and cartilage. When air travels through the larynx, the air is used to create a pressure that vibrates the vocal chords to produce sound.

The epiglottis is a flap that covers the esophagus. When we swallow, the epiglottis opens to allow food and liquids to enter the digestive tract.

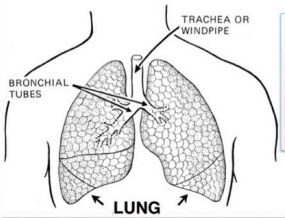




When we are not eating or drinking, the epiglottis stays upright, to allow air to travel from the pharynx to the larynx. When we are eating or drinking, the epiglottis folds down to cover the larynx and allow food or liquid to pass through the esophagus.

© 2015 Vanessa Jason ("Biology Roots")

RESPIRATORY SYSTEM
Station 9

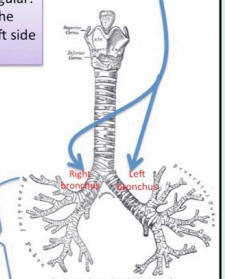


The trachea leads to the lungs, but the lungs are broken down into specific parts that work together to ensure that oxygen is delivered to the bloodstream.

The trachea leads to the bronchi (singular: bronchus). The bronchi is where the respiratory system branches into a left side and a right side.

Bronchi

The bronchi branch into even smaller tubes called "bronchioles" (little bronchi). To get enough oxygen requires lots of small airways. This creates more surface area within the lungs, and increases the rate at which oxygen can enter our bloodstream and carbon dioxide can be expelled.



Bronchioles

(singular: bronchus)

© 2015 Vanessa Jason ("Biology Roots")

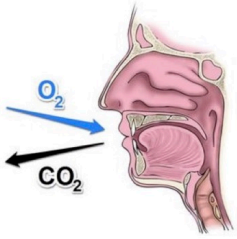
RESPIRATORY SYSTEM
Station 13

Oxygen & Carbon Dioxide

Our cells require energy, which we provide with the food we eat. However, our cells need to heavily break down our food into specific molecules that they can use for energy.

Oxygen is required to break food down. It is a necessary component of the reaction in breaking down sugar into usable energy for our cells.

Carbon dioxide is a product of the chemical reaction is breaking food down. It is a waste product that we do not need.



The air we breathe in is mostly nitrogen (78%). However, when we breathe it in we simply breathe most of it back out. Oxygen sticks around because it is attracted to the HEMOGLOBIN of red blood cells.

© 2015 Vanessa Jason ("Biology Roots")

RESPIRATORY SYSTEM
Station 19

CPR

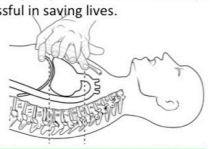
CARDIO PULMONARY RESUSCITATION

There are two basic parts of CPR:
1) Administering oxygen to the harmed person from the person performing CPR. Even if little oxygen is delivered to the patient, breathing is mimicked. This can be "mouth to mouth" or using a specialized CPR mask.
2) Chest compressions to create a manual pump for the heart.



"Hands only" CPR is only the chest compressions, which can also save lives. Hands only CPR is sometimes preferably if it a stranger unwilling to perform mouth-to-mouth in emergency situations. Hands only can be just as successful in saving lives.

The lungs work closely with the heart to make sure ALL your cells are getting oxygen!



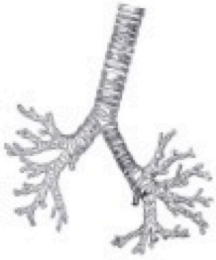
CPR was invented in the 1960s

© 2015 Vanessa Jason ("Biology Roots")

A TOTAL OF 19 STATIONS AND 23 TASK CARDS.
STUDENT ANSWER SHEET INCLUDED.
EDITABLE.

RESPIRATORY SYSTEM

Station 1

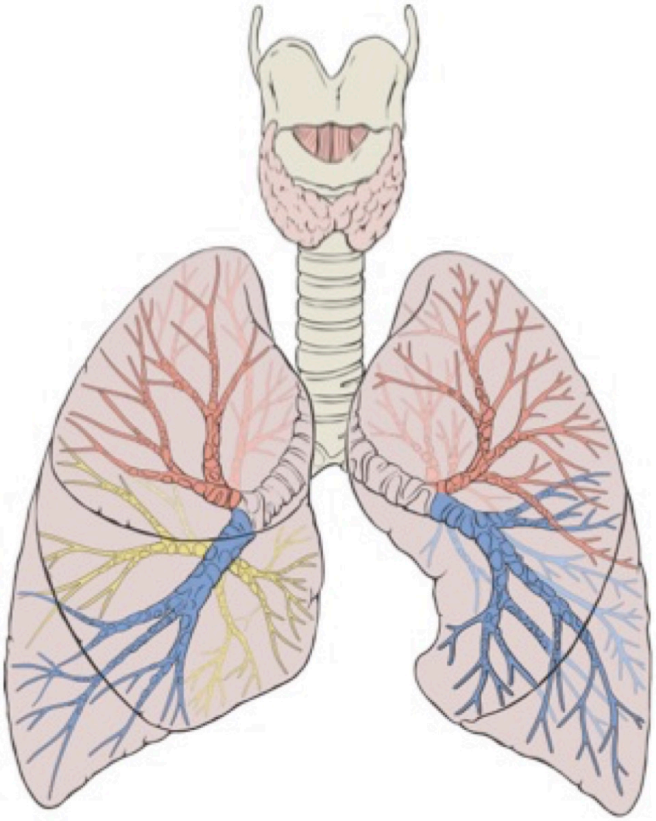


What is it?

The respiratory system is a group of tissues and organs that enable you to breathe in order **deliver oxygen from the atmosphere to your red blood cells.**

This system includes your airways, lungs, blood vessels, and muscles attached to them that work together so you can breathe. The respiratory system works closely with the cardiovascular system.

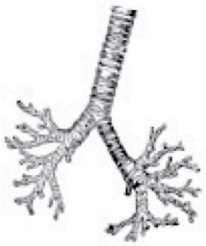
PREVIEW



© 2015 Vanessa Jason ("Biology Roots")

RESPIRATORY SYSTEM

Station 2



Primary Functions:

1. Supplies oxygen to our cells.
2. Removes carbon dioxide from our cells

(Carbon dioxide can be lethal if allowed to accumulate in our body).

PREVIEW

Secondary Functions:

3. Filters particles such as dust and pollen from our airways.
4. Produces sound.
5. Participates in olfactory functions (smell).

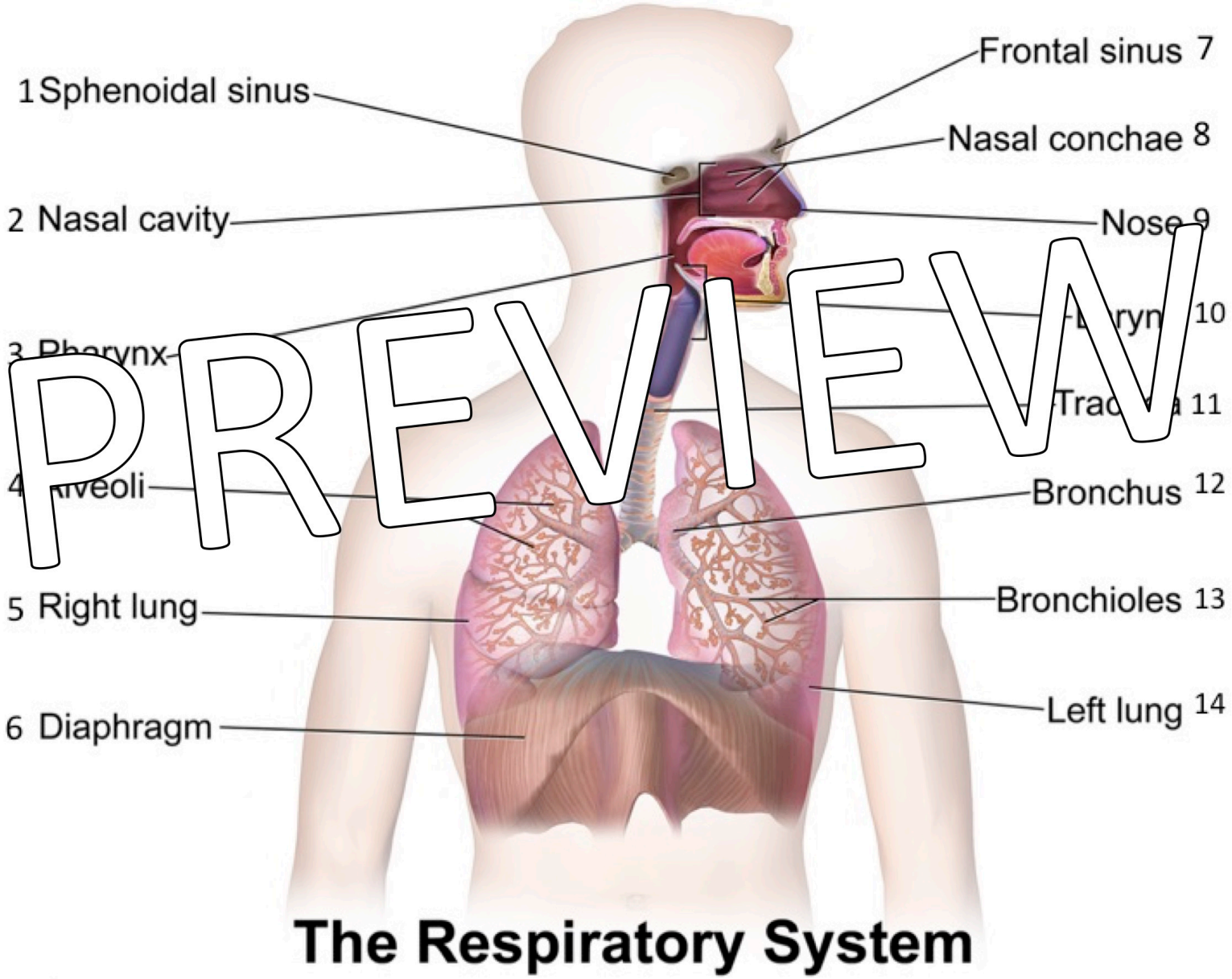


© 2015 Vanessa Jason ("Biology Roots")

RESPIRATORY SYSTEM

Station 3

Parts of the Respiratory System



The Respiratory System

PREVIEW

Upper vs. Lower Respiratory Tract

The **upper** respiratory tract is everything <u>above</u> the larynx. The **lower** respiratory tract is everything <u>below</u> the larynx.

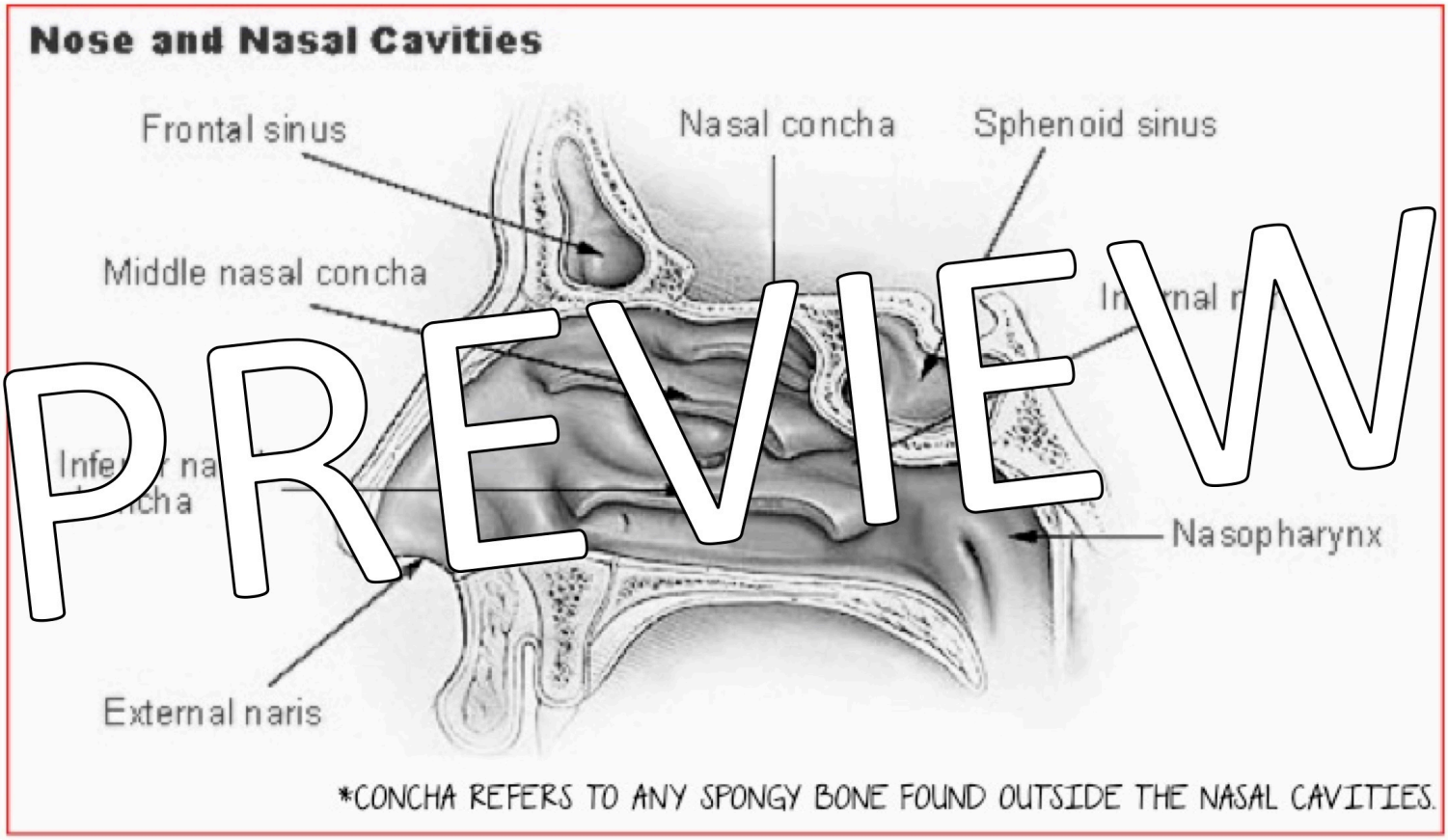
© 2015 Vanessa Jason ("Biology Roots")

RESPIRATORY SYSTEM

Station 4

Nasal Cavity

The nasal cavity is a large air-filled space above and behind the nose. Each nostril leads to its own nasal cavity.



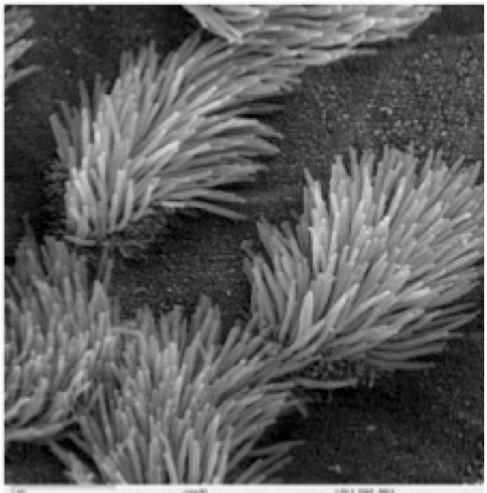
PREVIEW

The nasal cavity is lined with mucous membrane and tiny hairs called cilia.

The function of the nasal cavity is to:

- Provide an orifice for air to enter the body
- Moisten, warm and filter the air as it enters the body.

The nasal cavities lead to the nasopharyx, which is where the nasal passages meet the pharynx.



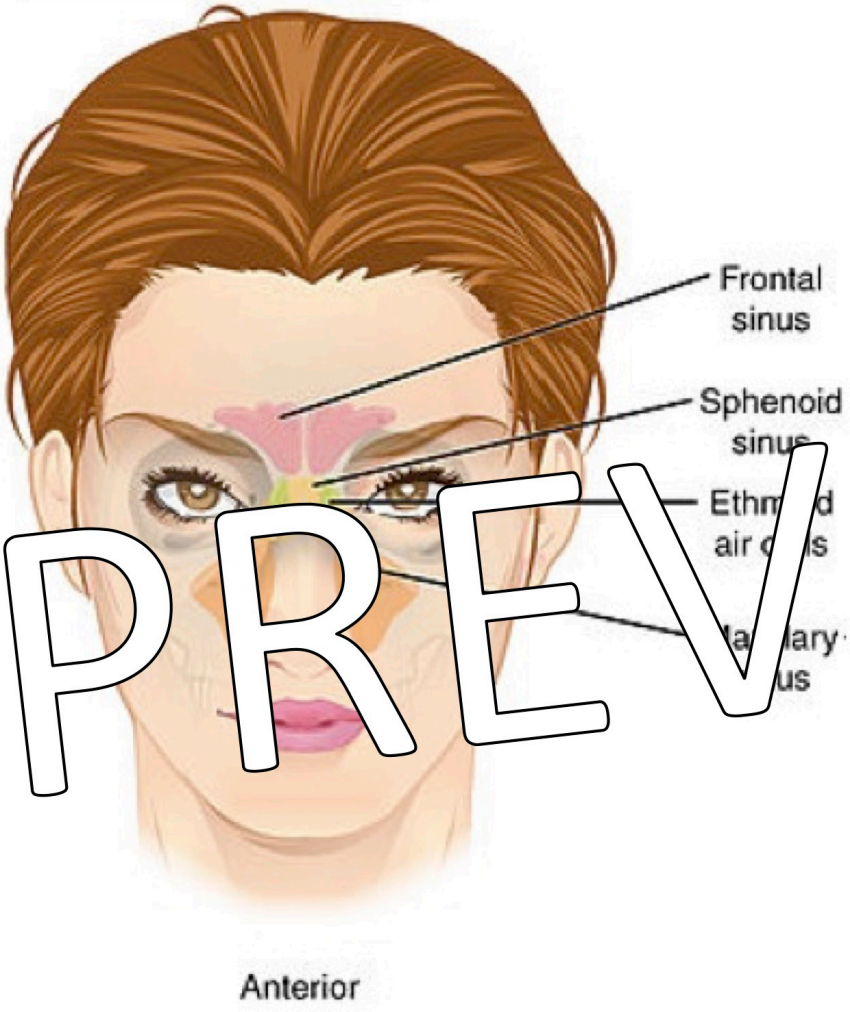
Cilia found within the nasal cavity.

© 2015 Vanessa Jason ("Biology Roots")

RESPIRATORY SYSTEM

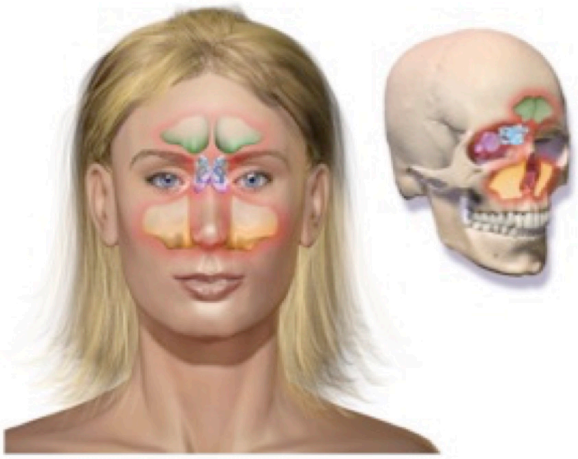
Station 5

Sinuses



The sinuses have many roles, but in the respiratory system their primary function is to produce the mucus that lines the nasal cavity to keep it moist. The mucus also contains proteins ou[t]odies from dirt, dust, p[o]llu[t]an[t]s, and ba[c]te[r]a.

PREVIEW

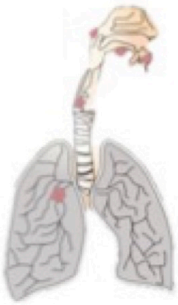


Normally, sinuses are filled with mostly air. This helps keep the skull light. Certain conditions, such as the common cold or structural issues, can lead to a sinus infection. If the sinuses are infected, they are filled with fluid and mucous that contains pathogens (virus or bacteria). This puts a lot of pressure on your face and eyes, and can lead to headache and overall discomfort.

© 2015 Vanessa Jason ("Biology Roots")

RESPIRATORY SYSTEM

Station 6



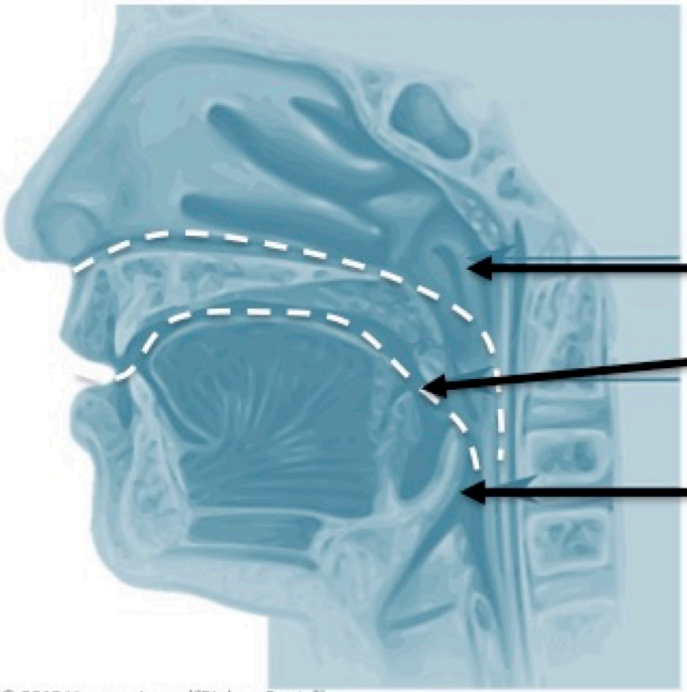
Pharynx (AKA THE THROAT)

The pharynx can be divided into 3 sections:

1. **Nasopharynx**
   The nasopharynx co[illegible] the nose to the pharynx.
2. **Laryngopharynx**
3. **Oropharynx**
   The oropharynx connects the mouth to the pharynx.

PREVIEW

Both the nasopharynx and the oropharynx lead to the laryngopharynx, which can hold both food and air and helps guide the food or air where to go.



Nasopharynx (air through nose)

Oropharynx (air through mouth)

Laryngopharynx
(air from nasopharynx and oropharynx lead to laryngopharynx)

© 2015 Vanessa Jason ("Biology Roots")

STUDENT ANSWER SHEET (TO RECORD ANSWERS)
5 PAGES

Name: _____ Date: _____

RESPIRATORY SYSTEM

Station 1

What is it? The respiratory system is a _____ of _____ and _____ that enable you to _____ in order to deliver _____ from the _____ to your _____.

The respiratory system includes:

- Airways
- _____
- _____
- Muscles

These parts work together so you can _____!

The respiratory system works closely with the _____.

Station 2 Functions

Primary Functions

The respiratory system...

1. _____ _____ to our _____.
2. _____ _____ _____ from our cells.

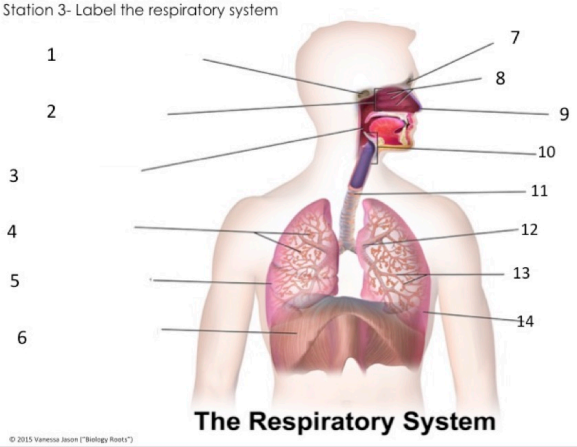
Secondary Functions

3. _____ _____ such as _____ and _____ from our airways.
4. _____ _____.
5. Participates in _____ _____ (_____).

Station 3: How are the upper and lower respiratory system divided?

_____
_____
_____
_____.

Station 3- Label the respiratory system



The Respiratory System

© 2015 Vanessa Jason ("Biology Roots")

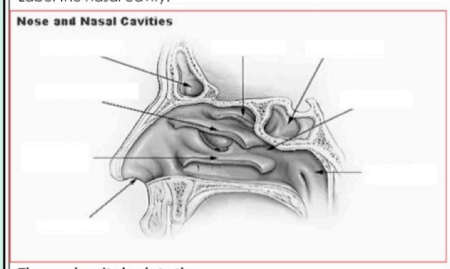
RESPIRATORY SYSTEM EXHIBITION LAB

Station 4: The Nasal Cavities

The nasal cavity is a _____.

Each _____ leads to _____.

Label the nasal cavity:



The nasal cavity leads to the _____.

What does the term "conchae" refer to?

_____
_____.

The function of the nasal cavity is to:

- _____
- _____

The nasal cavity is lined with:

- _____
- _____

_____.

Station 5: The Sinuses

What is the function of the sinuses?

_____
_____

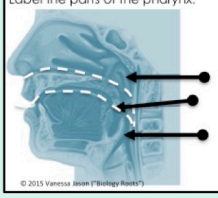
Mucous is important because:

- It helps to keep our nasal cavity _____.
- It protects us from breathing in dirt, _____.

How might a sinus infection lead to a headache_____

_____

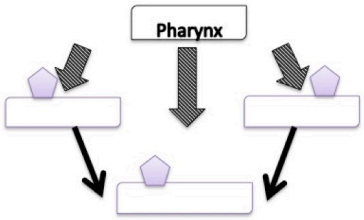
Label the parts of the pharynx:



Station 6: The Pharynx

The pharynx is more commonly known as the _____.

It can be divided into ____ parts:



The nasopharynx connects the _____ to the _____.

The oropharynx connects the _____ to the _____.

Both the nasopharynx and the oropharynx lead to the _____, which helps guide _____ or _____.

When breathing through your nose, the air goes to the (circle one) nasopharynx | oropharynx. When breathing through your mouth, the air goes to the (circle one) nasopharynx | oropharynx.

RESPIRATORY SYSTEM EXHIBITION LAB

Station 7: The larynx (aka the _____)

The main function of the larynx is to _____. It made primarily of _____. **How does the larynx produce sound?** _____

Label:



What is the epiglottis and why is it important?

_____
_____
_____
_____
_____.

What is the laryngeal prominence (Adam's apple) made of? Why can you see the laryngeal prominence in men, but not in women?

What is laryngitis? _____

Station 8: The Trachea

The trachea leads to the _____. and is _____ long and _____ in diameter.

Why is it important that the trachea contains flexible cartilage rather than fixed bone? _____
_____
_____
_____.

What is a tracheostomy? _____
_____
_____
_____.

Station 9: The Bronchi

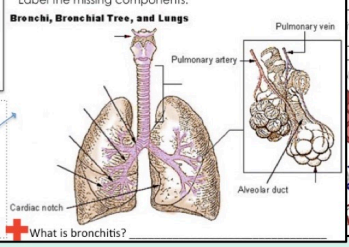
The respiratory system branch into a left and right side at the _____. (singular: _____).

Why are there so many small branches within the lungs?

_____
_____
_____.

Label the missing components:

Bronchi, Bronchial Tree, and Lungs



Put all bronchi in order from largest to smallest in diameter (including bronchioles):

What is bronchitis? _____

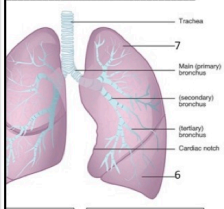
RESPIRATORY SYSTEM EXHIBITION LAB

gs

into sections called _____.

g have 3 lobes, but the left lung has 2?

_____
_____



5

de up of specialized tissue that contain many _____ so that oxygen can diffuse across the respiratory ne and into the _____.

lveoli

es are known as _____

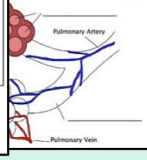
are as thick as a _____

lead to the _____,

th _____,

_____.

li: _____



Station 12: Gas Exchange

Gas exchange occurs in the _____, across the _____.

Oxygen diffuses from the _____ to the _____; carbon dioxide diffuses from the _____ to the _____.

Examine the diagram. Blood coming from the heart contains (circle one) [carbon dioxide | oxygen], Blood going towards the heart contains [carbon dioxide | oxygen].

Station 13 O_2 & CO_2

How do oxygen and carbon dioxide relate to breaking down food?

_____
_____
_____
_____.

The air is mostly _____, but we have no use for it.

Oxygen is attracted to the _____ found on our red blood cells.

Station 14: Heart and Lungs Work Together

The heart is a _____.

The heart pumps _____ to be _____ oxygenated.

The heart also pumps _____ to become deoxygenated as the cells use up the oxygen.

RESPIRATORY SYSTEM EXHIBITION LAB

ry Membrane

ane consists of the _____ and the _____

_____µm thick.

respiratory membrane, _____ in the alveoli to the _____ or vice versa.

respiratory membrane h is about the size of _____.

Smoke

_____.

co lead to cancer?

_____.

ad to a class of diseases _____.

e 21st century there will be eaths from tobacco smoke.

chemicals in tobacco, harmful.

deaths are from tobacco

people die each year e.

_____.

PR: _____, which can be done as _____

_____ to create a manual

Station 16: The Diaphragm

What is the diaphragm and what is it connected to? _____
_____
_____.

Why is the diaphragm necessary? (try breathing without moving your chest): _____
_____.

Station 18: COPD

COPD stands for:

_____

Examples:

- _____
- _____
- _____
- **Bronchiectasis**

People with COPD have _____ or destroyed _____ membranes.

The leading cause of COPD is _____. It is the _____ leading cause of death in the U.S.

Causes of COPD:

1. Smoking
2. _____
3. _____
4. _____
5. _____

Emphysema is diagnosed if _____ _____ have formed in the lungs, meaning it takes longer to _____.

Symptoms of emphysema:



ADDENDUM: List the parts of the respiratory system in order as an oxygen molecule travels through them, beginning in the atmosphere and ending on a red blood cell: