The Respiratory System Webquest

The Breath of Life-National Geographic

1. Our lungs are, essentially, a network of connected _______ tubes _______ that bring _______ O_2 _______
from the air into our _______ blood _______, nourishing the trillions of cells that make up our bodies. The lungs
also _______ clean _______ the blood of _______ CO_2 _______ waste created when cells use oxygen. We breathe in
_______ 22,000 _______ times per day! (28.5 m^3 air!)

Click on "Lung Anatomy" at the bottom of the page

2. Using the information in this section, to label the diagram.

Also known as the windpipe
Trachea

Larger branches that lead from the trachea are called
L+R bronchi

The smallest branches are called
bronchioles

Muscle that lies beneath the lungs is called the
diaphragm

Click on "Alveoli"
3. What occurs at the alveoli?

A. What is dropped off at the lungs by the blood vessels? _______ CO_2 _______
B. What is picked up at the lungs by the blood vessels? _______ O_2 _______

4. Using the information in this section, to label the diagram.

Tiny air sacs found at the end of the bronchioles are called
alveoli

These surround the tiny air sacs
capillaries

Click on "Lung Functions"

5. What part makes your lungs inflate (expand) and deflate (contract)? _______ diaphragm _______
6. What happens when the diaphragm is pulled down (Do you inhale or exhale)? _______ inhale _______
7. What gas do you take in when you inhale? _______ O_2 _______ When you exhale? _______ CO_2 _______
8. What happens when the diaphragm relaxes (Do you inhale or exhale)? _______ exhale _______
9. Pathway of Air:

Nasal Cavity

OR

Mouth

Pharynx

Larynx

Trachea
(Windpipe)

Alveoli
Tiny Air Sacs

Bronchioles
Smallest branches

Bronchi
Small branches

Blood Vessels (Capillaries)

Click on "Affects of Asthma"

10. What happens when someone has an asthma attack? **airways of the lungs shrink, \( \downarrow \) the supply of O\( \text{2} \) to the body.**

11. Draw a normal bronchiole below versus a bronchiole of someone having an asthma attack:

**NORMAL BRONCHIOLE:**

**BRONCHIOLE DURING AN ASTHMA ATTACK:**

12. What can trigger or cause an asthma attack? (Identify three)

A. pollen, cigarette smoke   B. medicines   C. animal dander

13. What does an inhaler do for someone with asthma? **An inhaler emits a mist of medicine into the lungs, which relaxes the muscles and opens the airways.**


Click on "Why do we breathe?"

1. Explain how the respiratory system works with the circulatory system. **Your body needs O\( \text{2} \) to get rid of CO\( \text{2} \). O\( \text{2} \) is brought into the lungs then your blood picks it up and takes it to the cells. Your blood picks up the CO\( \text{2} \) from your cells and carries it to the lungs. When you exercise your heart beats faster so that the blood can carry O\( \text{2} \) to your cells quicker.**
2. We all know that humans use lungs in order to get oxygen, however not all organisms have lungs. Using the information found on the website, describe how the following organisms get oxygen:

<table>
<thead>
<tr>
<th>Organism</th>
<th>How does this organism get its oxygen?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sally the Salamander</td>
<td>by lungs, through skin + gills - lungs are basically hollows - no diaphragm - open close mouth to force air in - skin allows H2O to go through &amp; O2 absorbed. Most have gills when young - made up of very thin capillaries surrounded by water channels</td>
</tr>
<tr>
<td>Big Bird</td>
<td>both humans and birds have lungs, but the lungs of a bird are different. Explain how: Lungs in humans are like balloons. Birds lungs are open at both ends - air comes in one end &amp; exits the other - special air sacs before the lungs store air before its ready to enter the lungs &amp; air sacs after the lungs store air until it's ready to be breathed out.</td>
</tr>
<tr>
<td>Maggie the Mosquito</td>
<td>tracheal tubes that connect to every cell which are connected to the outside of the body through holes in the abdomen called spiracles. Air enters through the spiracles travels through the tracheal tubes &amp; goes directly to each cell.</td>
</tr>
<tr>
<td>Patty the Plant</td>
<td>stomata - allow air to enter the leaf where the plant cells can take in O2, when O2 is used up CO2 flows back through stomata. Also have guard cells that can open or close to protect the plant from drying out.</td>
</tr>
<tr>
<td>Lucky the Lizard</td>
<td>both humans and reptiles have lungs, but the lungs of a reptile are different. Explain how: Lungs are less spongy &amp; more hollow - making them less efficient at getting O2</td>
</tr>
</tbody>
</table>

http://kidshealth.org/kid/htbw/lungs.html

1. True or False: Just like your eyes, your lungs are the same size.  
   - False: Lungs are divided into two lobes.  
   - Lungs typically have 2 lobes, but some animals such as pigs may have 3 lobes.

2. Your lungs are protected by your rib cage.

3. What is the **diaphragm**? A domed shaped muscle that works with your lungs to allow you to inhale & exhale.

4. Go onto the next page and find the picture of the lungs. Draw a picture that includes the location of the lungs and the diaphragm.

http://kidshealth.org/kid/watch/er/choking.html?tracking=K_RelatedArticle

1. **True or False**: You have two "pipes" or "throats"?
   - True: We actually have three pipes/throats.
   - Trachea, which leads to the lungs.
   - Esophagus, which leads to the stomach.

2. Which pipe does it go down when choking? **Trachea**

3. Which pipe/throat SHOULD it go down? **Esophagus**
4. How does the epiglottis protect you from choking?

A small cartilaginous flap of tissue that covers the trachea when you swallow, forcing food to go down your esophagus.


SCROLL DOWN and read under the diagram

1. The nasal cavity has two functions. One is to __________ the air that is entering and the other is to trap particles in its __________.

2. What is the epiglottis? __________

3. Flap of tissue that guards the trachea

What is the function of the epiglottis? __________

4. Guards the trachea from food entering

3. What is another name for the larynx? __________

Why is this a good nickname for the larynx? __________

http://kidshealth.org/kid/talk/q&a/yawn.html

Fill in the blanks that describe the three hypotheses as to why you may yawn:

Hypothesis #1: We yawn when we are _________ or _________, we just don’t breathe as deeply as we usually do. As this theory goes, our bodies take in less _________ because our breathing has _________. Therefore, yawning helps us bring more _________ into the blood and move more _________ out of the blood.

Hypothesis #2: Another theory is that yawning stretches the _________ and lung tissue. Stretching and yawning may be a way to flex muscles and joints, increase heart rate, and feel _________.

Hypothesis #3: The people believe that yawning is a _________ to redistribute the oil-like substance called _________ that helps keep lungs lubricated inside and keeps them from _________ . So, if we didn’t yawn, according to this theory, taking a deep breath would become _________ and _________ — and that would not be good!

http://kidshealth.org/kid/talk/q&a/sneeze.html Solve some everyday mysteries about SNEEZING!

1. Why do you sneeze? ________

2. TRUE or FALSE: Your heart stops when you sneeze. ________

3. TRUE or FALSE: Sneezes are an automatic reflex that can’t be stopped once sneezing starts. ________

4. Write out a summary of another fact you find interesting: ________
Based on the information you have learned about the respiratory system, make a hypothesis how each problem below would affect a human body. (EMI-401)

Problem #1: What would happen if your **diaphragm** were damaged (had a hole in it)?
- Since our breathing is based on atmospheric pressure, the lungs can only work if the space around them is sealed.
- If there is a hole in the thoracic cavity, the lung collapses & breathing ceases.

How would this be detrimental to the rest of your body? **EXPLAIN**!
All cells in the body need Ox - if the lungs do not function properly, then cells don't get the Ox they need or get rid of their CO2 & other waste products.

Problem #2: What would happen if the **epiglottis** didn't function properly?
- Then you are at high risk for food/liquids getting into the lungs.
- Too much air also getting into digestive tract.

Using the website below and additional websites if needed, complete the following Venn diagram. Please note the number of characteristics that must be included in each section.
http://www.buzzle.com/articles/bronchitis-vs-pneumonia.html

**SMOKING**
http://www.kidshealth.org/kid/watch/house/smoking.html

1. Every single day nearly **3900** kids between the ages **12** and **17** start smoking.

2. **1** in **5** kids smoke in high school.
3. Why do kids start smoking? Identify two reasons:
   a. curiosity, or the idea of doing something dangerous,
   b. act cool - look like an adult, peer pressure

4. What are some signs that someone is a SMOKER?
   IDENTIFY FOUR
   a. bad breath            c. clothes smell of smoke
   b. yellow teeth          d. more colds/cough

5. Why do people become addicted to smoking? nicotine

6. How many people die each day from a smoking related disease? 1200

Using the website below, observe the current estimates of youth tobacco use.
http://www.cdc.gov/tobacco/data_stats/fact_sheets/youth_data/tobacco_use/index.htm

Graph the following percentages below. Do not forget your X and Y axis label (IOD-403):

Percentage of high school students who smoked one or more cigarettes in the previous month in 2009

SEX + ETHNICITY OF H.S. SMOKERS

[Graph with data on percentage of high school students who smoked one or more cigarettes by sex and ethnicity]
**FINAL CHECK!**

Label all of the parts of the respiratory system shown below. In addition, use arrows to show where the oxygen flows from outside the human body until it reaches the capillaries.

<table>
<thead>
<tr>
<th>Part #</th>
<th>Name of Part</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>nose</td>
</tr>
<tr>
<td>2</td>
<td>mouth</td>
</tr>
<tr>
<td>3</td>
<td>larynx</td>
</tr>
<tr>
<td>4</td>
<td>Lung</td>
</tr>
<tr>
<td>5</td>
<td>bronchus</td>
</tr>
<tr>
<td>6</td>
<td>diaphragm</td>
</tr>
<tr>
<td>7</td>
<td>pharynx (?)</td>
</tr>
<tr>
<td>8</td>
<td>trachea</td>
</tr>
<tr>
<td>9</td>
<td>bronchus</td>
</tr>
<tr>
<td>10</td>
<td>bronchioles</td>
</tr>
<tr>
<td>11</td>
<td>alveoli</td>
</tr>
</tbody>
</table>

1. Bronchi carries air into the **bronchioles**

2. At the end of each bronchiole, there are clusters of tiny sacs called **alveoli**

3. Where does the exchange of oxygen and carbon dioxide takes place? **alveoli** and **cells**

4. What is the muscle beneath your lungs that helps to move air in and out of the lungs? **diaphragm**

5. What is the flap of tissue that prevents food from entering the trachea and lungs? **epiglottis**