

Chemicals & Human Health
Lung Toxicology Problem Set: Student Sheet

Directions

1. Answer the pre-questions.
2. Go to the website www.biology.arizona.edu/chh and click on the link to the Lung Toxicology Problem Set.
3. Write the correct answer in the column labeled Correct Answer. All of the answers can be found in the Lung Toxicology Problem Set.
4. Explain the correct answer.

Pre-Questions (circle the answer you think is correct)	Correct Answer (write the letter of the correct answer from the website)	Explain (explain the correct answer)
Which of the following is NOT found in the human lung? A. bronchiole B. trachea C. bronchi D. alveoli	B	Lung picture will be attached to back.
Which of the following is the smallest part of the lung where gas exchange occurs? A. bronchiole B. trachea C. bronchi D. alveoli	A	Approximately how many are there in the human body: 300 million
Which of the following alveolar cell types clean particles deposited in the lungs? A. macrophages B. epithelium type I C. epithelium type II D. fibroblasts E. capillaries	A	Draw a picture that includes all of the cell types and label: Picture will be attached on back
One of the primary functions of the alveoli is to create a large surface area in the lungs. Why is a large surface area so important?	D	Explain: Alveoli must have a large surface area in order to diffuse the most amount of O2 possible.

<p>A. for energy storage B. to remove toxins from the blood C. to store oxygen for future use D. for gas exchange E. for the krebs cycle</p>		
<p>When do the alveoli develop in lungs in humans?</p> <p>A. during the first 1-2 years of life B. in the 1-5th week of pregnancy C. between 3 and 5 years of age D. during the last 6 weeks of pregnancy E. continually throughout a person's lifetime</p>	A	<p>Describe the stages of lung development:</p> <p>Major airways are developed in the 0-5 week period; bronchi branches at 5-16 weeks; Lung cells differentiate at 16-26; airways expand at 26 weeks; alveoli form at 1-2 years</p> <p>*Bonus Question: How do you think second-hand smoke may affect a child? SHS may affect the childs alveoli</p>
<p>Which of the following causes the most deaths in the US?</p> <p>A. AIDS B. motor vehicles C. homicide D. smoking E. alcohol</p>	D	<p>How is that attributed to the most deaths?</p> <p>Smoking causes lung cancer, stroke, heart disease, emphysema, and other diseases</p>
<p>Which statement do you agree with?</p> <p>A. Environmental tobacco smoke (ETS), also known as second-hand smoke, has LESS toxic compounds than directly inhaled tobacco smoke. B. Environmental tobacco smoke (ETS), also known as second-hand smoke, has MORE toxic compounds than directly inhaled tobacco smoke.</p>	B	<p>Explain why.</p> <p>Toxins are destroyed from the high temperature of the smoked end, while the lit end of the cigarette emits more toxins.</p> <p>About how many toxic compounds are in cigarette smoke? 40</p>

<p>What is PM10?</p> <p>A. the number of packs per day that cause lung cancer in 10% of the population</p> <p>B. particles which are small enough to be deposited in the lungs</p> <p>C. a measure of the amount of pollen in a certain volume of air</p> <p>D. a measure of the severity of an asthma attack</p>	<p>B</p>	<p>How does this hurt the lungs?</p> <p>Particles smaller than 10 microns in diameter are able to reach the lungs and irritate them</p>
<p>Oxidants are one toxic component of cigarette smoke. Why are they dangerous?</p> <p>A. They block surfactant secretion so that alveoli collapse.</p> <p>B. They block the oxygen carrying capacity of hemoglobin.</p> <p>C. They cause cilia to quit beating so lungs get clogged with particles.</p> <p>D. They can damage the DNA of lung cells much like the sun damages skin cells.</p>	<p>D</p>	<p>What disease can be the end result of this damage?</p> <p>Cancer</p>
<p>Asthma is caused by decreased airflow in and out of the lungs due to:</p> <p>A. small abnormalities in airways</p> <p>B. reversible bronchial spasms</p> <p>C. destruction of alveolar walls</p> <p>D. allergic reaction in lung tissues</p>	<p>B</p>	<p>List three responses in the lung that cause asthma.</p> <p>Swelling of cells lining the airways, muscle spasms, and excess mucus</p> <p>What is a "trigger?" List 2 examples.</p> <p>Exercise, dust</p>

