

Chemicals & Human Health Toxicology Problem Set

- Answer the pre-questions (circle the answer in the Pre-Questions column).
- Go to the website www.biology.arizona.edu/chh and click on the link to the Toxicology Problem Set.
- Write the correct answer in the column labeled Correct Answer. All of the answers can be found in the Toxicology Problem Set.
- 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)
<p>Which statement is the most correct?</p> <p>A. Chemicals manufactured by humans are more dangerous to human health than naturally occurring chemicals.</p> <p>B. Both natural and human-made chemicals are potentially toxic to humans.</p> <p>C. Naturally occurring chemicals are more poisonous to humans than synthetic chemicals.</p>		<p>Give an example of each</p> <p>Natural toxic substance:</p> <p>Man-made toxic substance:</p>
<p>One of the items below is a hazardous substance. Four are sources of a hazardous substances. Which one is a hazardous substance?</p> <p>A. clogged furnace</p> <p>B. cigarette</p> <p>C. a dog</p> <p>D. paint applied before 1978</p> <p>E. dust mite parts</p>		<p>What is a common health effect of this hazard?</p> <p>What is the source for this hazard?</p> <p>List 2 additional examples of a hazard and its source:</p>
<p>Which of the following is NOT a possible route of entry for a hazard?</p> <p>A. ingestion</p> <p>B. absorption</p> <p>C. exposure</p> <p>D. inhalation</p>		<p>Describe the primary ways a hazard can enter the body:</p> <p>Which route of entry may result in more of the toxicant in the blood and why?</p>

<p>When DDT, a pesticide, enters the human body, it is _____.</p> <p>A. water soluble and is easily excreted in urine.</p> <p>B. stored in the bones.</p> <p>C. not toxic, but is processed by enzymes and becomes a different compound which is toxic.</p> <p>D. fat soluble and can be stored in fat tissue.</p>		<p>Define solubility:</p> <p>What type of chemical is more easily eliminated from the body, water-soluble or fat-soluble?</p> <p>Based on your answer above, is DDT easily eliminated from our bodies? Why?</p>
<p>Who took the largest dosage of aspirin?</p> <p>A. an adult woman who weighs 125 lbs. and took 300 mg of aspirin</p> <p>B. a teenage boy who weighs 135 lbs. and took 600 mg of aspirin</p> <p>C. a baby who weighs 20 lbs. and took 100 mg of aspirin</p> <p>D. a chihuahua who weighs 5 lbs. and took 50 mg of aspirin</p>		<p>Define dose:</p> <p>Calculate the dose for each person/animal in the question (show your calculations and include units):</p>
<p>Which will NOT help you determine the dose of a hazardous gas received by a person?</p> <p>A. their respiration rate</p> <p>B. their length of exposure to the gas</p> <p>C. the source of the gas</p> <p>D. their frequency of exposure to the gas</p> <p>E. the concentration of the gas</p> <p>F. the gas's chemical and biological properties</p>		<p>Will the dose be higher or lower if:</p> <p>a person breathes more rapidly?</p> <p>a person is exposed once?</p> <p>a person is exposed over years?</p> <p>the gas is easily absorbed?</p>

<p>Most hazardous substances exhibit a "dose-response relationship." What does this mean?</p> <p>A. The harm caused by the hazard increases as the amount of hazard entering the body (dose) increases.</p> <p>B. It does not matter how big a dose you receive, you will always have same amount of harm/sickness.</p> <p>C. Exposure to the hazard always results in harm.</p> <p>D. Fifty percent of the people will die when exposed to 0.1 mg/kg.</p>		<p>Draw a dose-response curve:</p>
<p>A family home has a clogged furnace that is producing carbon monoxide, a hazardous gas. Which family member is likely to be harmed the most?</p> <p>A. Billy, the son who is in 1st grade</p> <p>B. Baby Shea, who is going to be in preschool next year</p> <p>C. Karla, the nanny who cares for the toddler every weekday morning</p> <p>D. Ms. Nguyen, the mother who works at home.</p> <p>E. Mr. Nguyen, the father who works at the University</p>		<p>Give 2 reasons for your answer:.</p>
<p>All of the people listed below live in the same house. Who is most likely to experience toxic effects from the second-hand smoke?</p> <p>A. the grandmother, who is very fit</p> <p>B. the mother, who smokes</p> <p>C. the father, who smokes</p> <p>D. the teenage daughter, who has asthma</p> <p>E. the son, who is in 5th grade</p>		<p>Explain your answer:</p>

<p>There are several ways to control or reduce your exposure to a hazard. Opening a window in a room full of people who are smoking is an example of controlling your exposure to environmental tobacco smoke by _____.</p> <p>A. treating the symptoms of the hazard</p> <p>B. diluting the hazard</p> <p>C. distancing yourself from the hazard</p> <p>D. removing the hazard</p>		<p>Explain your answer:</p> <p>Give 2 additional examples of how to control or reduce exposure to a hazard:</p>
<p>Which environmental health scientist would determine ways to prevent and reduce exposure to second hand smoke?</p> <ol style="list-style-type: none"> 1. a toxicologist 2. an epidemiologist 3. an industrial hygienist 4. an occupational and environmental medicine physician 5. a pharmacologist 		<p>Do any of the careers described in this question interest you? Why or why not?</p>