LESSON 74

CLASSWORK

Lethal Dose Toxicity

Name _____

Date _____ Period _____

Purpose

To calculate and compare the toxicity of various substances.

Part 1: Determining Lethal Dose

Both aspirin and acetaminophen are common fever and pain relievers. However, too much of either can be toxic. Your job is to figure out how much of each is toxic to a child and to an adult. Assume that the lethal dose for rats applies to humans as well.

LD_{50} is measured in milligrams of the substance per kilogram of body weight. Your first step is to convert measurements of body weight from pounds to kilograms.

1 kg = 2.2 lb

1. What is the mass of a 132 lb human in kilograms?

2. How much does a 22 lb child weigh in kilograms?

3. The LD_{50} for acetaminophen is 2404 mg/kg (rat, oral).

a. How many milligrams of acetaminophen would be a lethal dose for a 132 lb adult?

b. How many 500 mg tablets of acetaminophen would be a lethal dose for a 132 lb adult?

c. How many milligrams of acetaminophen would be a lethal dose for a 22 lb child?

d. How many 500 mg tablets of acetaminophen would be a lethal dose for a 22 lb child?

4. The LD_{50} for aspirin is 200 mg/kg (rat, oral).

a. How many milligrams of aspirin would be a lethal dose for a 132 lb adult?

b. How many 500 mg tablets of aspirin would be a lethal dose for a 132 lb adult?

c. How many milligrams of aspirin would be a lethal dose for a 22 lb child?

d. How many 500 mg tablets of aspirin would be a lethal dose for a 22 lb child?

5. Which is more toxic, acetaminophen or aspirin? How great is the difference in their toxicities? Explain.

Part 2: Comparing Lethal Doses

Examine the table of lethal doses for various substances.

1. What substance in the table is the most toxic? Explain.

2. Rank the substances in the table based on their lethal doses, with 1 being the most toxic.

3. Are any substances in the table good for you? Explain.

4. Are there any substances in the world that are not toxic? Explain.

5. **Making Sense** How does the size of a dose relate to the toxicity of a substance?

6. **If You Finish Early** How many tablets of vitamin A would be lethal for a 140 lb human? Assume that each tablet contains 3.0 mg of retinal.