Lethal Dose Table

- **Lethal Dose (LD_{50})** is the amount of an ingested substance that kills 50 percent of a test sample. It is expressed as mg/kg or milligrams of substance per kilogram of body weight. You should assume that LD50 is the same for rats and humans.

Common name	Toxin	Lethal doses	Description	Toxic Response
aspirin	Acetyl-salicylic acid $C_9H_8O_4$	LD_{50} 200 mg/kg (rat, oral)	Odorless white crystal	Gastric distress, confusion, psychosis, stupor, ringing in the ears, drowsiness, hyperventilation
table salt	sodium chloride NaCl	LD_{50} 3g/kg (rat, oral) 12357 mg/kg (human, oral)	white cubic crystals	eye irritant, elevated blood pressure
bleach (fumes)	Chlorine Cl_2	LD_{50} 850 mg/kg (rat, inhaled)	greenish colored gas, amber liquid, pungent odor	corrosive to eyes, skin, respiratory tract, nausea, vomiting, pulmonary edema
arsenic	arsenic, arsenic trioxide As, As_4O_6	LD_{50} 15 mg/kg (rat, oral)	grey metallic crystals	acute- irritates eyes, skin, respiratory tract, nausea. chronic-convulsions, tissue lesions, hemorrhage, kidney impairment
sugar	glucose $C_6H_{12}O_6$	LD_{50} 30 g/kg (rat, oral)	sweet white powder	depressed activity, gastrointestinal disturbance, If diabetic-heart disease, blindness, nerve damage, kidney damage.
lead	lead Pb	Lowest published dose 450 mg/kg (human, oral)	bluish, silvery solid	acute- headache, insomnia, joint pain Chronic- anemia, kidney disease, reproductive and developmental toxin
cola	caffeine $C_8H_10N_4O_2$	LD50 140mg/kg (dog,oral)	white odorless powder or crystals	acute renal failure, nausea, psychosis, hemorrhage, increased pulse, convulsions
alcohol	ethanol C_2H_6O	LD_{50} 7060 mg/kg (rat, oral)	colorless liquid, pleasant odor	nausea, headache, vomiting, dizziness, nervous system depression, confusion, loss of consciousness
vitamin A	retinol $C_{20}H_{30}O$	LD_{50} 2000mg/kg	yellow crystals, orange solid	convulsions, unconsciousness, reproductive toxin
Cadmium	Cd	LD50 225 mg/kg (rat, oral)	Lustrous solid	Renal damage, lung damage, bone damage
Mercury	Hg	LD50 1 mg/kg (rat, oral)	Odorless, Silver liquid	Nervous system failure, visual disorders, deafness

Name _____Teacher Version_____ Date _____ Class_____

Student Worksheet (4.1)

Purpose: In this activity you will compare the toxicity of various substances.

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1. According to the table, which substances can be toxic or deadly?

All substances are potentially toxic to an organism if enough of it is taken in (orally, dermally, through inhalation, etc.)

2. What distinguishes substances like salt and sugar from those found in e-waste like lead, mercury, cadmium and arsenic?

Although substances like salt and sugar can be toxic, that only occurs if excessively large amounts are taken in by the organism. Those substances associated with e-waste require much smaller quantities and also pose greater negative responses in the organism.

3. Given what you have written above, write a definition for "hazardous materials".

The definitions should include the idea that although all things can be considered harmful in extremes, those materials that cause the most damage in small amounts are considered hazardous.