

Activity 3: Unit Conversion and Dosage Calculations

Learning Objectives

Part 1 *Convert units using equivalent units*

Part 2 *Calculate dosages using equivalent units*

Estimated Completion Time 60–75 Minutes

Instructor Information

Completion times may vary based on the math skills of the students. Students tend to find this activity difficult, yet useful since they see how it relates directly to their health career.

Activities 2 and 3 could be performed during a laboratory period.

ANSWERS TO QUESTIONS

Part 1. The Metric System

1. (answers in bold)

Physical Quantity	Customary Unit	Metric Unit
Mass	Pound	Gram
Volume	Fluid ounces	Liter
Length	Inches	Meter
Energy	Calorie	Joule
Temperature	Fahrenheit	Kelvin
Pressure	Psi	Pascal

2. Gram

3. Milliliter

4. 2000 mL

5. a. 15,000 µg b. Vitamin E

Part 2. Dosage Calculations

1. 166 lb

2. 6.2 miles

$$3. \frac{1 \text{ tsp}}{5 \text{ mL}} \times \frac{1 \text{ mL}}{1 \text{ cc}} \times 10 \text{ cc} = 2 \text{ tsp}$$

Tell the mother to give the child 2 teaspoons every 4 hours.

$$4. \frac{1 \text{ tsp}}{5 \text{ mL}} \times \frac{5 \text{ mL}}{125 \text{ mg}} \times \frac{250 \text{ mg}}{1 \text{ dose}} = 2 \text{ tsp per dose}$$

$$\frac{2 \text{ tsp}}{1 \text{ dose}} \times \frac{3 \text{ doses}}{1 \text{ day}} = 6 \text{ tsp per day}$$

$$5. \frac{1 \text{ tablet}}{800 \text{ mg}} \times \frac{80 \text{ mg}}{1 \text{ kg per day}} \times \frac{1 \text{ kg}}{2.205 \text{ lbs}} \times \frac{45 \text{ lb.}}{1 \text{ child}} = 2 \text{ tablets per day}$$

Divided into four doses, this would be ½ tablet per dose.

Activity 3: Skill Development

$$1. \frac{1500 \text{ meters}}{1 \text{ race}} \times \frac{0.62 \text{ miles}}{1000 \text{ m}} = 0.93 \text{ miles}$$

2.

$$\frac{3.46 \text{ kg}}{1 \text{ baby}} \times \frac{2.205 \text{ lb}}{1 \text{ kg}} = 7.63 \text{ lb}$$

$$0.63 \text{ lb} \times \frac{16 \text{ oz}}{1 \text{ lb}} = 10 \text{ oz}$$

Total weight is 7 lb 10 oz.

3.

$$\frac{1 \text{ tsp}}{5 \text{ mL}} \times \frac{1 \text{ mL}}{10.0 \text{ mg}} \times \frac{150 \text{ mg}}{1 \text{ day}} \times \frac{1 \text{ day}}{4 \text{ doses}} = 0.75 \text{ tsp per dose}$$

Or $\frac{3}{4}$ teaspoon per dose

4.

$$\frac{5.0 \text{ mL}}{250 \text{ mg}} \times \frac{500 \text{ mg}}{\text{dose}} = 10 \text{ mL per dose}$$

$$\frac{10 \text{ mL}}{1 \text{ dose}} \times \frac{1 \text{ tsp}}{5 \text{ mL}} = 2 \text{ tsp per dose}$$

Every 6 hours means that there would be 4 doses in a day, so $2 \text{ tsp} \times 4 \text{ doses} = 8$ teaspoons per day.

5.

$$\frac{3.0 \text{ mg}}{1 \text{ kg per day}} \times \frac{1 \text{ kg}}{2.205 \text{ lb}} \times \frac{22 \text{ lb}}{1 \text{ patient}} \times \frac{1 \text{ day}}{2 \text{ doses}} = 15 \text{ mg per dose, } 30 \text{ mg per day}$$

6. Establish the safe limits:

$$\frac{10 \text{ mg}}{1 \text{ kg per day}} \times \frac{1 \text{ kg}}{2.205 \text{ lb}} \times \frac{66 \text{ lb}}{\text{child}} = 300 \text{ mg lower limit per day}$$

$$\frac{20 \text{ mg}}{1 \text{ kg per day}} \times \frac{1 \text{ kg}}{2.205 \text{ lb}} \times \frac{66 \text{ lb}}{\text{child}} = 600 \text{ mg upper limit per day}$$

The child is receiving $3 \times 125 \text{ mg per day}$, or 375 mg per day , which falls within the safe limits.