Nursing 131 Household to Metric Conversion

Slide 2 & 3

Household/Metric Conversion

In the metric system liquid volumes are measured in milliliters or liters. Weight is measured in micrograms, milligrams, grams, or kilograms.

1 liter   1000 milliliter

1 kilogram

1,000 grams

1,000,000 milligrams

1,000,000,000 micrograms

Household/Metric Conversion

In the household system liquid volumes are measured in quarts, pints, cups, tablespoons, and teaspoons. Weight is measured in ounces & pounds.

1 quart   2 pints   4 cups   64 tablespoons   192 teaspoons

16 ounces   1 pound

Slide 4 & 5   Example One

Household/Metric Conversion

- Our First Example Problem:
  - 2 ½ teaspoons of cough medicine has been prescribed. A measuring device marked in ml is being used. How many ml should be administered?

Household/Metric Conversion

Here are the 5 basic steps to change from one unit to another

Step 1 - Identify that you need to convert

Step 2 – Write down what you have

Step 3 – Write down your equivalent fraction

Step 4 – Reduce units

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_____
_____
_____
_____
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_____

Metric/Household Conversion

- Our Example Problem:
  - 2 ½ teaspoons of cough medicine has been prescribed. A measuring device marked in ml is being used. How many ml should be administered?

Step 1 *Identify you need to convert*
The question asks how many of one unit should we prepare in another type of unit.

Step 2 *Write down what you have*
The quantity we have – our known quantity - is 2 ½ tsp. (teaspoons) Write this as a fraction with 1 on the bottom.

$$\frac{2 ½ \ tsp}{1}$$

(Writing the amount as a fraction will help us when we multiply later.)

Step 3 *Relate the units*
An equivalency chart will list how the units relate.

Household/Metric Conversion

Conversions between Household and Metric Units

1 quart	1 liter (l)
1 pint	500 milliliters (ml)
1 cup	240 milliliters (ml)
1 fluid ounce (oz.)	30-32 milliliters (ml)
1 tablespoon (tbsp.)	15 milliliters (ml)
1 teaspoon (tsp.)	5 milliliter (ml)
2.2 pound (lbs)	1 kilogram (kg)

We now have:

$$\frac{2 ½ \ tsp}{1} \quad X \quad \frac{5 \ ml}{1 \ tsp}$$

To convert we will need to multiply our fractions.

Step 4 *Reduce the units*
Cross off any matching pairs of unit labels. The label left should be what you want to find.

We now have:

$$\frac{2 ½ \ tsp}{1} \quad x \quad \frac{5 \ ml}{1 \ tsp}$$

Step 5 *Perform the math*

$$\frac{2 ½ \ tsp}{1} \quad x \quad \frac{5 \ ml}{1 \ tsp}$$

$$\frac{2 ½ \ x \ 5}{1 \ x \ 1} \qquad \frac{12.5}{1} \qquad \text{(Reduce any fractions.)}$$

12.5 ml

2 ½ teaspoons is equivalent to 12.5 ml.

Household/Metric Conversion

- Our Second Example Problem:
  - A child weighs 24 lbs, 14 oz. You determine that 24 lbs., 14 oz. is equivalent to _____ kg.

_____

_____

_____

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Household/Metric Conversion

- Our Second Example Problem:
  - A child weighs 24 lbs, 14 oz. You determine that 24 lbs., 14 oz. is equivalent to _____ kg.

Step 1   *Identify you need to convert*
The key words that indicate we need to convert are "equivalent to."

Step 2   *Write down what you have*
The quantity we have is in 2 different units. We have 24 lbs and we have 14 oz. We first change the 14 oz to lbs by dividing by 16.
We then add this to the 24lbs. Use a calculator or long division to change the 14/16 to a decimal. We can then write this as a fraction with 1 on the bottom.

$$\frac{14}{16} \quad + 24 \quad = 24.875 \qquad \frac{24.875}{1}$$

Step 3   *Relate the units*
An equivalency chart will list how the units relate.

Household/Metric Conversion

Conversions between Household and Metric Units

1 quart	1 liter (l)
1 pint	500 milliliters (ml)
1 cup	240 milliliters (ml)
1 fluid ounce (oz.)	30-32 milliliters (ml)
1 tablespoon (tbsp.)	15 milliliters (ml)
1 teaspoon (tsp.)	5 milliliter (ml)
2.2 pound (lbs)	1 kilogram (kg)

Step 3   *Relate the units*
An equivalency chart will list how the units relate.
Our chart lists 1 kg = 2.2 lbs.   We will write this equivalency as a fraction.

We can write this fraction 2 ways:

$$\frac{1\ kg}{2.2\ lbs} \quad \text{or} \quad \frac{2.2\ lbs}{1\ kg}$$

Because the fraction we wrote in step 2 has lbs on the top, our next fraction must have lbs on the bottom.

Step 3   *Relate the units*

We now have:

$$\frac{24.875\ lbs}{1} \quad \text{x} \quad \frac{1\ kg}{2.2\ lbs}$$

To convert we will need to multiply our fractions.

Household/Metric Conversion

Step 4   *Reduce the units*
Cross off any matching pairs of unit labels. The label left should be what you want to find.

We now have:

$$\frac{24.875 \text{ lbs}}{1} \quad x \quad \frac{1 \text{ kg}}{2.2 \text{ lbs}}$$

In this example the only unit left is kg which is what we want to find.

Household/Metric Conversion

Step 5   *Perform the math*
$$\frac{24.875 \text{ lbs}}{1} \quad x \quad \frac{1 \text{ kg}}{2.2 \text{ lbs}}$$

$$\frac{24.875 \times 1}{1 \times 2.2} = \frac{24.875}{2.2} \quad \text{(Reduce any fractions.)}$$

11.30682   kg

When converting from lbs to kg – round your result to the nearest tenth.

24 lbs, 14 oz. is equivalent to 11.3 kg.