

## CONCEPT: DIMENSIONAL ANALYSIS

● **Dimensional Analysis** is a fail proof process that allows you to convert from one unit to another.

- Design the problems to \_\_\_\_\_ with your **given amount**, and to \_\_\_\_\_ with the **end amount** of your unknown.
- Just follow the units to ensure the unwanted units are canceled out.

### Conversion Strategies

- Many conversion problems utilize the **given amount** and **conversion factors** in order to isolate an **end amount**.
  - Their general format can be shown as:

Given Amount	Conversion Factor 1	End Amount
32 inches	2.54 cm 1 inch	= _____ cm
115 min		= _____ year

**EXAMPLE:** A TA can grade 4 assignments per hour. If each assignment has 12 questions, how many questions can the TA grade in 130 minutes?

**STEP 0:** If present, start with the **given amount** that is not a **conversion factor**.

**STEP 1:** Identify the **end amount** you want to isolate for your unknown.

**STEP 2:** Write down all the **conversion factors**.

**STEP 3:** Find the connection between the **given amount** and the **conversion factors** in order to isolate the **end amount**.

**CONCEPT: DIMENSIONAL ANALYSIS**

**PRACTICE:** If the distance between Washington, D.C. and New York City is 224.9 miles, determine the distance in centimeters.

**PRACTICE:** The average human body is composed of approximately 160 fluid ounces of blood. How many quarts of blood does the average human body possess? (1 gallon = 4 quarts , 1 pint = 2 cups , 1 cup = 8 fluid ounces , 1 quart = 2 pints).

**PRACTICE:** Lipitor, a pharmaceutical drug that has been shown to lower “bad” cholesterol levels, while boosting “good” cholesterol levels had over \$12 billion in sales last year. Each pill weighs 2.5 g, which contains 4.0% of the active ingredient by mass. What mass in kg of the active ingredient is present in one bottle of 120 pills?