

Name: _____ Section: _____

Determining Whether Your Answers Are Sensible - Dimensional Analysis

Directions: When doing any type of problem that involves calculations, it is important for you to check your answer to determine whether or not it makes sense. This can be done by simply rereading the question and then by looking at your answer. If your answer does not seem reasonable, you should check your work and/or redo the problem. The following examples will help you practice doing this.

1. Tina was working with Rachel on a conversion activity in class when Frank looked at one of their answers (14,528,000 grams) and started laughing. Tina and Rachel asked Frank what he was laughing at and he said "Your answer is so wrong!" Rachel said to Frank, "What did you get?" and Frank replied, "2.5 grams." Tina yelled, "That is ridiculous because the question asked for the number of grams in sixteen tons!"

- Is Frank's answer as ridiculous as Tina thinks? Explain.

- Show the proper calculations to help support your reasoning.

2. How many days are equal to 43,200 seconds?

- Should your answer be a big number or a small number? Explain.

- Show the proper calculations.

- Does your answer make sense? Explain.

3. After the Mars Orbiter was lost in 1999, the spacecraft teams decided that they needed to use just one set of units - only those in the metric system. Unfortunately, Paul, a member from the Colorado team, had the grueling task of being the one who had to convert all of the information from the standard system to the metric system. Paul typically accomplished this task by using a computer program, however, the program was not functioning properly and he had to do some conversions by hand. He had to first convert the distance between Earth to Mars ($\approx 35,000,000$ miles) from miles to meters. After doing his calculations, Paul determined that 35,000,000 miles was equivalent to 56,327,040,000 meters. Since he had not done this process by hand since middle school, he decided to have one of his associates check his work. Upon viewing Paul's work and answer, his associate said, "You better hope the conversion computer program is up and running soon because conversions like that will lead to another catastrophe."

- Should Paul retry this conversion, or should he move on to the next one? Explain.
- Show the proper calculations to help support your reasoning.

4. How many centimeters are in 50 feet?

- Should your answer be a big number or a small number? Explain.
- Show the proper calculations.
- Does your answer make sense? Explain.