**A Mole of M&Ms** Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_

Hypothesis: If we were to cover the 48 contiguous United States with a mole of M&Ms, the thickness of the layer of M&Ms would be closest to:

1. 1 mile b. 10 miles c. 50 miles d. 200 miles

**Show your factor-label work for all problems!**

1. You have been provided with 50 cm3 of M&Ms. Count the number of M&Ms that you have. What is the volume of 1 M&M?

I have \_\_65\_\_ M&Ms 50 cm3/ \_\_\_\_\_\_\_\_M&Ms = \_\_\_\_\_\_\_\_\_\_\_\_\_ cm3/1 M&M *(volume of one M&M in cm3)*

1. If you were to have one mole of M&Ms, what would be the volume of that mole?

\_\_\_\_\_\_\_\_\_ cm3/1 M&M \* 6.02 x 1023 M&Ms = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm3 *(volume of one mole of M&Ms in cm3)*

1. Convert this number to meters cubed (1 m3 = 1,000,000 cm3)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm3 \_\_ 1 m3\_\_\_\_\_\_\_\_\_\_= \_\_\_\_\_\_\_\_\_\_\_\_\_m3 *(volume of one mole of M&Ms in m3)*

1. 1,000,000 cm3
2. Find the area of the United States in Meters squared (m2). The area of the United States is 3.02 x 106 miles squared. (1 mile squared = 2.59 x 106 m2)

3.02 x 106 miles squared m2 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ m2 *(area of the US in m2)*

 1 1 miles squared

1. If the volume of one mole is to cover this area… calculate the depth in m, then convert to km

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_m3*(volume of one mole of M&Ms in m3)* = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_m *(depth of M&M in Meters)*

 m2 *(area of the US in m2)*

\_\_\_\_\_\_\_\_\_\_ m *(depth of M&M in Meters)*\_\_\_\_\_\_\_\_1\_\_\_\_\_\_km = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_km *(depth of M&M in km)*

1. 1000 m
2. Convert this depth to miles. (1 km = 0.621 miles)

\_\_\_\_\_\_\_\_\_\_\_\_\_km *(depth of M&M in km*)\_\_ \_\_\_\_0.621\_miles\_\_\_ = \_\_\_\_\_\_\_\_\_\_\_\_miles

1. 1 km
2. My hypothesis was \_\_\_\_\_\_\_\_\_\_miles. I was correct / incorrect. (Circle one).
3. Measure the length of one M& M. If you had one mole of M&M’s that were all in a line like a train, how many round trips to the moon could you make? The moon is 240,000 miles from the earth.

Your M&M is 1.1 cm across.