Bridge Efficiency Worksheet

Name ___________________________________          Period _________

There are several steps to go through to figure out the efficiency of your bridge.

**Step 1:** Convert Grams into Pounds. There are 453.6 Grams per Pound. To do that you need to divide the number of grams that your bridge weighs by 453.6 gm/lbs.

\[
\text{My Bridge weight} \quad \frac{\text{gm}}{453.6 \text{ gm}} = \quad \text{lbs (Round to Three decimal places)}
\]

**Step 2:** Now you need to calculate how many pounds your bridge held. To do this you need to convert the number of Pounds per Square Inch (PSI) into Pounds. The pneumatic (Air) cylinder is 2” (inches) in diameter. You need to find out how many square inches are in a 2” circle. The formula to figure out the area of a circle is: \( \pi r^2 \).

\( \pi = 3.14 \) and \( r \) stand for the radius of the circle. A circle with a diameter of 2” would have a radius of 1”. Since \( 1^2 = 1 \), the formula \( \pi r^2 \) would equal 3.14. To convert PSI to Pounds you need to multiply the PSI that your bridge held by 3.14.

\[
\text{My PSI} \quad \frac{\text{ PSI}}{3.14} = \quad \text{lbs (Round to two decimal places)}
\]

**Step 3:** The lever on one side of the bridge tester is twice as long on one side than the other. That means you have to multiply the number of pounds from step 2 times two to find out the total amount of weight you bridge held.

\[
\text{Number of lbs from step 2} \quad \frac{\text{ lbs}}{2} = \quad \text{Total weight (lbs) your bridge held.}
\]

**Step 4:** To figure out how efficient your bridge was you need to divide the total weight your bridge held by the weight of your bridge in lbs.

\[
\text{Total weight my bridge held} \quad \frac{\text{ lbs}}{\text{ my bridges weight}} = \quad \text{Efficiency}
\]