name _____ per_____

Working with data

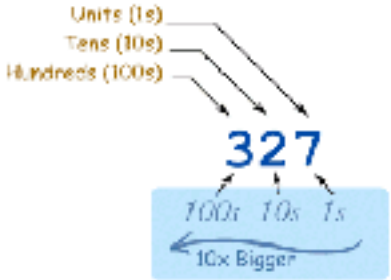
We can use the data we collected to check the efficiency of our pendulums and data collection. Use scratch paper for all calculations

I. Complete the table. See below for measurement conversion. **For time, take the average of the time for period for both 1 and 2 washers for each length**. You will also be using this information for graphing.

Length in cm (cm)	Length in meters (m) (L)	Time for 10 periods in seconds (s)	Time for 1 period in seconds (T)

Converting centimeters into meters
move the decimal 2 places to the left
-or- divide by 100

examples - 200 cm --> 2.00 m
75 cm --> .75 m
130 cm --> 1.30 m
25 cm --> .25 m
13 cm --> .13m



II. Pendulum Math

The formula below solves for the period of a pendulum (*T*) of a given length (L).

$$T = 2\pi\sqrt{\frac{L}{g}}$$

π = use 3.14
T= period of the pendulum in seconds (s)
L = length of the pendulum in **meters** (m)
g = acceleration of gravity (9.8 m/s^2) - **just use 9.8**

III. Data to use - complete the table on the back

A. Using the formula, find the period for all of your pendulum lengths. Use **meters**, not centimeters and the value for 1 period, not 10.

B. Divide your smaller of the 2 period values (formula or yours) over the larger one.

smaller period value
_____
larger period value

C. This is your percentage (%) efficiency for each length.

D. Find the difference between your % efficiency and 100 (absolute value). This gives you the % error for your pendulum.

Length (L)	period (your value) (T)	period (formula value) (T)	% efficient	% error

Answer the questions

1. Which pendulum length got you the closest result? How efficient was it? Feel free to test some of your other trial data.

2. What are some possible reasons why your group didn't get 100% efficiency?

3. Why do you think pendulum data might have errors?

Challenge - input your period data (most efficient data from above) and solve for *L*. See if the percent error is the same, better or worse.