REAL SCIENCE: THE EFFECT OF MASS ON PENDULUM SWING PERIOD

Purpose

To determine the effect mass has on the period of a pendulum's oscillation

Hypothesis

If the mass at the end of the pendulum ______ (increases/decreases), the period of a pendulum's swing will ______ (increase/decrease/not change)

Material

- s ring stand
- identical washers
- stop watch
- suspension or ring clamp
- C-clamps
- metre stick
- string
- protractor

Procedure

- 1. Set up ring stand and clamp so it hangs from edge of lab bench. Clamp the ring stand on the lab bench.
- 2. Measure out 1 metre of string.
- 3. Tie one end of the string to the clamp.
- 4. Tie the other end of the string to 1 washer. LEAVE PLENTY OF SLACK.
- 5. Pull the pendulum back and release.
- 6. Use a stop watch to measure how much time it takes for the pendulum to complete 10 complete (ie. round-trip) swings.
- 7. Record your time in the data table provided.
- 8. Untie the end of the string with the washer(s) and add another one.
- 9. Repeat steps 5-8 up to 5 washers.

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Special Instructions Pull pendulum back no more than 10 degrees keep distance between washer & pivot the same!

Data Tables

| | Period (10 swings) | | | Period (1 swing) |
|-----------|-----------------------|---|-----------|---------------------|
| 1 washer | | Divide values from left table by 10 to get values for right table | 1 washer | |
| 2 washers | | | 2 washers | |
| 3 washers | | | 3 washers | |
| 4 washers | | | 4 washers | |
| 5 washers | | | 5 washers | |

Graphing

Plot the data from the right table on a graph. Period (1 swing) will be plot on the y-axis. Number of washers will be plot on the x-axis. Plot individual points (ie. scatter plot) and include a best fit line.

Discussion

• What is the effect of mass on pendulum period? Use CER (Claim, Evidence, and Reasoning) as a framework for your answer.