**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**The Science of Swinging: Graphing Worksheet**

1. Choose five different lengths of string, and count the number of swings of the pendulum in 15 seconds. Don’t forget to start from the same angle for each test!

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|  |  |
| --- | --- |
| **Length of String (cm)** | **# of Swings** |
| 10 | 23 |
| 20 | 16 |
| 30 | 13 |
| 40 | 11 |
| 50 | 9 |

1. Does the angle that you start the pendulum at affect the number of swings? Take out a protractor and give it a try! For one length of string, start the pendulum at 4 different angles and count the number of swings that occur in 15 seconds?

|  |  |
| --- | --- |
| **Release Angle** | **# of Swings** |
| 90o | 13 |
| 60o | 14 |
| 45o | 13 |
| 30o | 13 |

1. What affects the number of swings during the period of 15 seconds?

Hint: Think of the equation: $ P=2 π\sqrt{\frac{l}{g}}$ , what variable do you have control over?

Based on the answers in part 1 and 2, and the fact that we cannot change gravity, g, or $π$, then the only thing that affects the number of swings in 15 seconds is the string length, l.

1. In the space below, draw a line graph showing the length of the string on the x-axis vs. the amount of times that the pendulum swings on the y-axis.

25

20

15

# Swings 10

5

0

 0 10 20 30 40 50 60

String Length [cm]