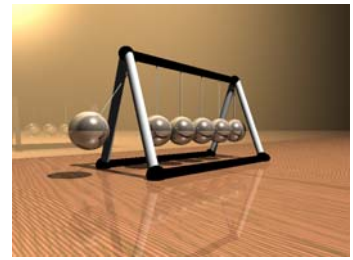


Name _____
Regents Physics



Pendulum Graphing Lab

Goals:

- Record the period and frequency of a swinging pendulum at varying lengths
- Graph period vs. pendulum length at varying lengths
- Predict the periods of other lengths and compare using experimentation

Materials:

- ⇒ Pendulum bob (20-g mass)
- ⇒ String (1.4 m)
- ⇒ Ring stand and iron ring
- ⇒ Protractor and stopwatch
- ⇒ Graph Paper and pencil

Procedure:

- Start with the smallest length of string
- Measure 15 degrees from the vertical and release bob for each trial and allow (3) vibrations to occur. Record the period of (1) vibration in the table below. Repeat and use the average of the trials to calculate the frequency.

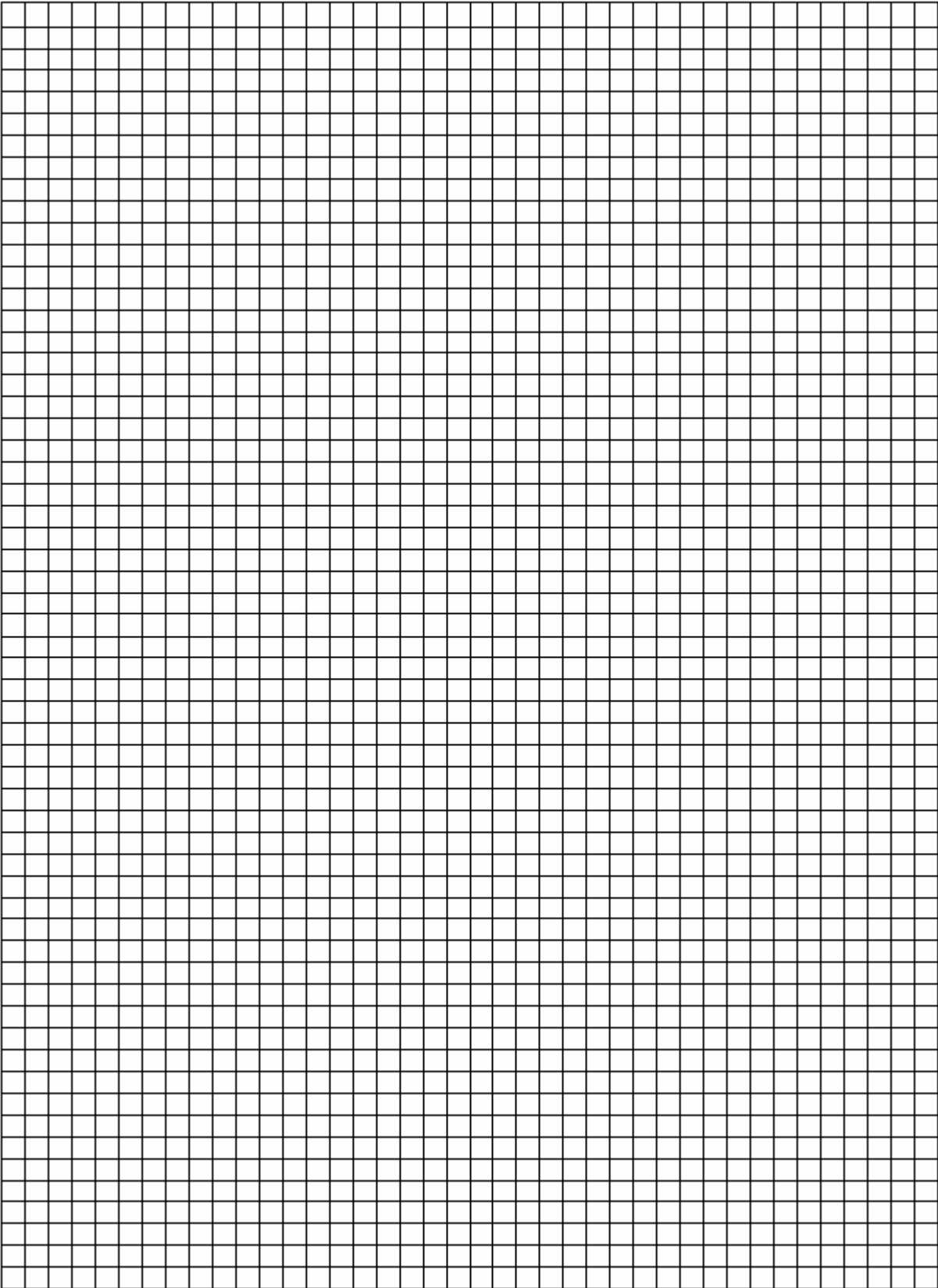
Experimental Table

Pendulum Length	Trial 1 Period (T)	Trial 2 Period (T)	Average Period (T)	Average Period ² (T ²)	Recorded Frequency (f)
0.1 m					
0.3 m					
0.5 m					
0.7 m					
1.1 m					

Frequency Calculations (show work) equation: $f = 1/T = \text{cycles/second (hz)}$

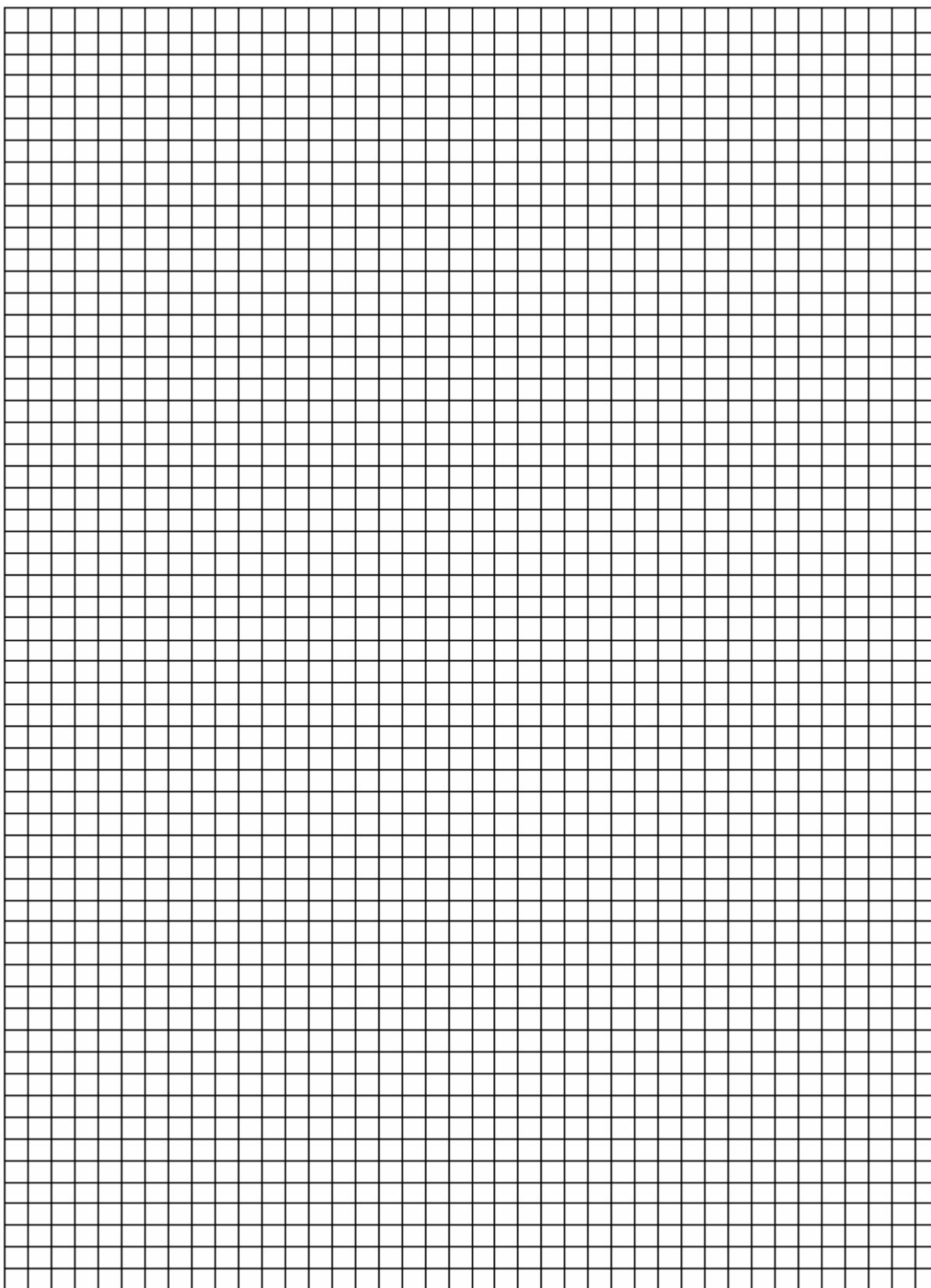
Graphing Exercises – Period vs. length

Directions: Graph the period (y-axis) vs. length (x-axis) using the values in your table. Make set a scale and draw a best-fit curve to represent your data.



Graphing Exercises – Period² vs. length

Directions: Graph the period² (y-axis) vs. length (x-axis) using the values in your table. Make set a scale and draw a best-fit line to represent your data.



Postlab

1. Make a prediction of the lengths below using graph #1 and experimentally determine how close you were by running the experiment. Record your results below.

Pendulum Length	Predicted Period	Experimental Period
0.2 m		
0.9 m		

2. How close were your predicted periods to the experimental periods?

3. What is the relationship between frequency and period?

4. How does changing the length of the pendulum effect the period of the pendulum?

5. Your weight is slightly greater at the North Pole than at the equator. Why?

6. Where is the value for g greater, the North Pole or the Equator?

7. Use your answers to #5 and #6 to explain how the period of motion of a pendulum changes as you move it from the Equator to the North Pole.

8. Let's say you moved a pendulum from Earth to our Moon, how does this affect the period?

