

Name: _____ Block: _____

Team members: _____

PHYSICS: SCIENTIFIC INVESTIGATIONS

Activity: Plenty of Pendulums

Part 1: INTRODUCTION

PURPOSE: In 1-2 concise sentences, explain the *overarching purpose* (the main scientific idea) of this activity. Why are you performing this activity?

PREVIOUS KNOWLEDGE: What do you already know about pendulums? List three characteristics of the about pendulums and what they are used for.

HYPOTHESIS: Write a 1-sentence hypothesis. Your hypothesis should be a *logical prediction* about the order of the pendulums' cycles in order from the pendulum that has the shortest period to the pendulum that has the longest period. *Your hypothesis must predict what will happen and must provide the best reason why it will happen.*

Part 2: EXPERIMENT AND COLLECTION OF EVIDENCE

Identify the *independent variable* of the experiment. What was the one parameter that was changed during the experiment? _____

Identify the *dependent variable* of the experiment. What was the response or output of the experiment? _____

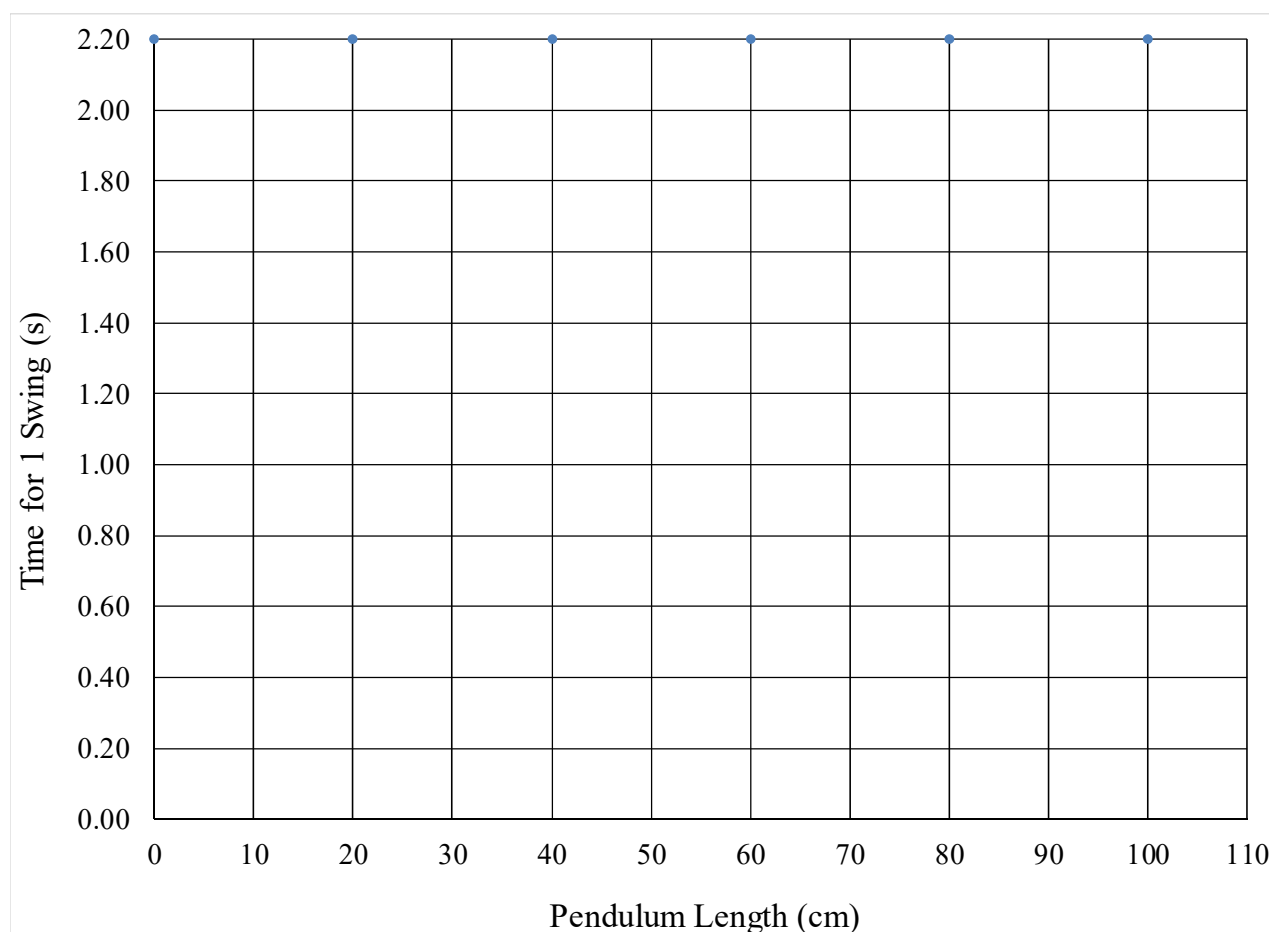
Identify five (5) constants in your experiment. What were five variables that remained the same and unchanged for all of the pendulums?

DATA TABLE

	Pendulum Length (cm)	Time for 10 back-and-forth swings (s)				Average time 10 swings t_{AVG} (s)	PERIOD Time for 1 swing T (s)
		Trial 1	Trial 2	Trial 3	Trial 4		
Pendulum 1							
Pendulum 2							
Pendulum 3							
Pendulum 4							
Pendulum 5							

Part 3: ANALYZE THE EVIDENCE

GRAPH 1: Plot the periods for the five pendulums (y-values) as a function of the lengths of the pendulums (x-values). Use solid dots as data points. NEATLY draw a single “best-fit” **curving line** starting from the origin through all of the data points on the graph.



Part 4: SUMMARY AND CONCLUSION. You must write complete sentences for each response.

- Explain if the evidence supported or rejected your hypothesis. (Was your prediction about pendulums correct or not?) Provide at least one reason why the evidence supported or rejected your hypothesis.

- Explain the relationship between the length of the pendulums and the period (time for one swing) of the pendulums.

- Identify any complications or problems that occurred during the activity. Explain why they happened. (examples: misuse of equipment, human error)

- Now that the experiment is complete and you have evaluated your evidence, you must make a recommendation about how long a pendulum must be to achieve a period of exactly 1.5 seconds for your grandfather clock. Explain why you make that recommendation.