Science 9

PENDULUM LAB

Uncle Harry's grandfather clock keeps time by means of a pendulum. Normally it keeps time very well but recently it has been gaining time (running fast). Uncle Harry has asked you to fix the pendulum so that it will keep time correctly again.

PURPOSE: to investigate the factors affecting the period of a pendulum using the Scientific Method.

BACKGROUND: The period of a pendulum is how long it takes it to make one cycle, back and forth. Because the motion occurs at regular intervals or periods, it is called **periodic motion**.

MATERIALS; ringstand setup, string, 3 masses, paperclip, protractor, ruler

PROCEDURE:

1. Set up a pendulum. Tie loops on both ends of a string. Hang one loop on the paperclip. Set two textbooks on the base.
2. Hang a small mass from the other loop.
3. Pull the mass back about 30 degrees and let go. Observe the pendulum.
4. Circle the factor you think affects the period the most;
   WEIGHT LENGTH OF STRING ANGLE OF RELEASE

Only one of these three factors has a strong effect on the period. The other two factors have only a slight affect or no affect at all.

5. Construct a data table for each factor. Test each factor, one at a time.
   WEIGHT – Use one piece of string. Use the same angle of release.
   LENGTH OF STRING - Cut 3 pieces of varying length. Use one mass and the same angle of release.
   ANGLE OF RELEASE – Use one mass and one piece of string.

6. Record the time for 20 swings, twice at each change. Calculate the average of the two. Divide the average by 20 to find the period.

7. Look at your results. Was your guess supported or not supported by the experimental evidence?

8. Write a lab report. **Be sure to include the 3 data tables AND the answers to the questions on the back of this sheet.**

QUESTIONS

1. What were the independent variables in your experiments?

2. What was the dependent variable in your experiments?

3. Which variable had a significant affect on the period of your pendulum? (Give evidence from your data tables to support this conclusion.)

4. Which variable had no affect?

5. How would you fix Uncle Harry's grandfather clock so that it would no longer gain time (run fast)?

6. List the steps to the Scientific Method and describe how your group used them in this investigation.

Data Sheet

/Weight/

Constants
Length of String
&
X° of Release

Mass	Trial 1	Trial 2	Trial 3	Avg.
Small				
Medium				
Large				

/Length of String/

Constants
Weight
&
X° of Release

Length of String	Trial 1	Trial 2	Trial 3	Avg.
Long				
Medium				
Short				

/Angle of Release/

Constants
Weight
&
length of String

X° of Release	Trial 1	Trial 2	Trial 3	Avg.
30°				
60°				
90°				