Pendulums!

Learning Goals:
- Students will understand what affects the period of a pendulum.

Background:

Question: Mass, length, pullback angle. What variables affect the period (swing time) of a pendulum?

Prediction:

Procedure:
1. Open the internet browser and start the Pendulum Lab simulation at http://phet.colorado.edu/simulations/sims.php?sim=Pendulum_Lab

2. Experiment with the simulation to determine what variables affect the period (swing time) of a pendulum.

What did you find out?

Pendulums!
Length vs Period

Learning Goals:
- Students will understand what affects the period of a pendulum.
- Students will construct a graph and analyze data.

Question: How does the length of a pendulum affect its period?
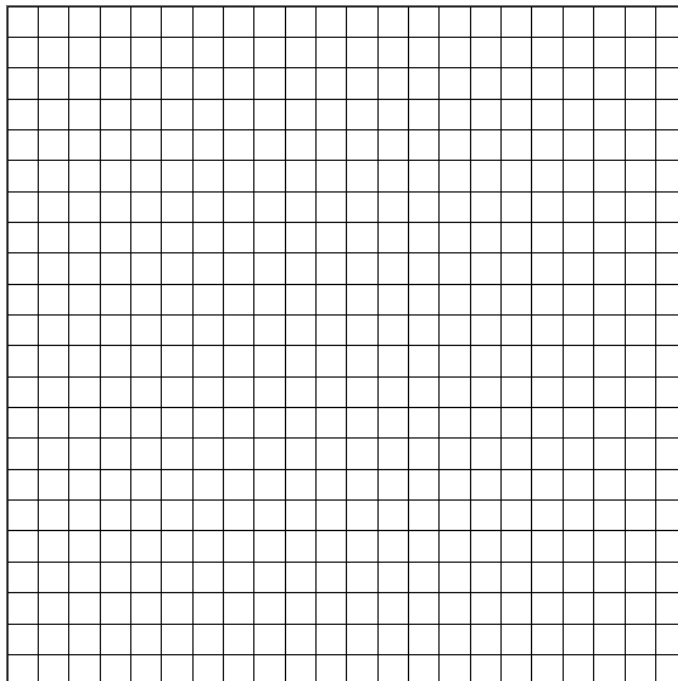
Hypothesis:

Procedure:
1. Open the internet browser and start the Pendulum Lab simulation at
   http://phet.colorado.edu/simulations/sims.php?sim=Pendulum_Lab

2. Design a controlled experiment that determines how pendulum length affects period time.

3. Using the photogate timer, record the period time (round to 0.01) for 5 different pendulum lengths.

4. Graph pendulum length vs period time. Analyze your data, write your conclusion, and answer the questions.

Data
Controls:

Pendulum Length (m)					
Period Time (sec)					

Conclusion

Questions
1. What is the dependent variable in this experiment? Explain.

2. What is the independent variable in this experiment? Explain.

3. What are the controls in this experiment? Explain.

Pendulums!
Mass vs Period

Learning Goals:
- Students will understand what affects the period of a pendulum.
- Students will construct a graph and analyze data.

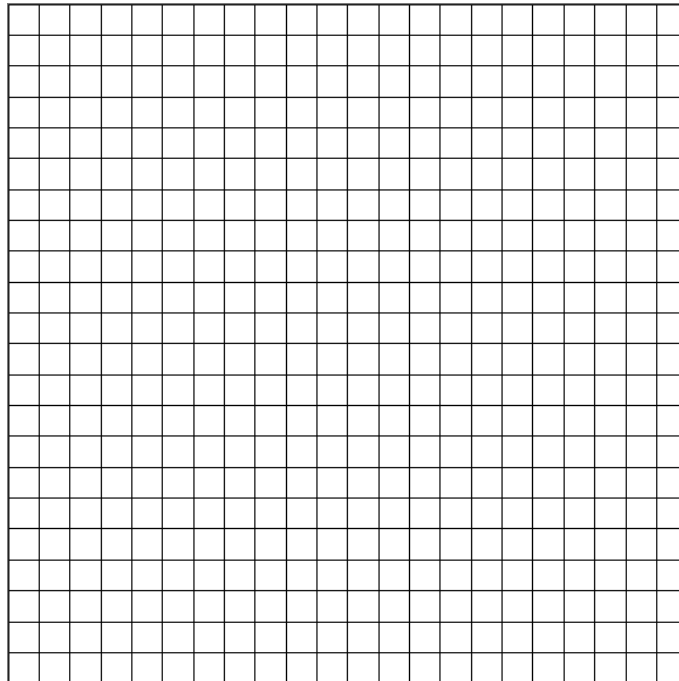**Question:** How does the mass of a pendulum affect its period?

Hypothesis:

Procedure:
1. Open the internet browser and start the Pendulum Lab simulation at http://phet.colorado.edu/simulations/sims.php?sim=Pendulum_Lab

2. Design a controlled experiment that determines how mass affects period time.

3. Using the photogate timer, record the period time (round to 0.01) for 5 different pendulum masses.

4. Graph pendulum mass vs period time. Analyze your data, write your conclusion, and answer the question.

Data

Controls:

Pendulum Mass (g)					
Period Time (sec)					

Conclusion

Questions

1. What is the dependent variable in this experiment? Explain.

2. What is the independent variable in this experiment? Explain.

3. What are the controls in this experiment? Explain.

Pendulums!
Pullback Angle vs Period

Learning Goals:
- Students will understand what affects the period of a pendulum.
- Students will construct a graph and analyze data.

Question: How does the pullback angle of a pendulum affect its period?
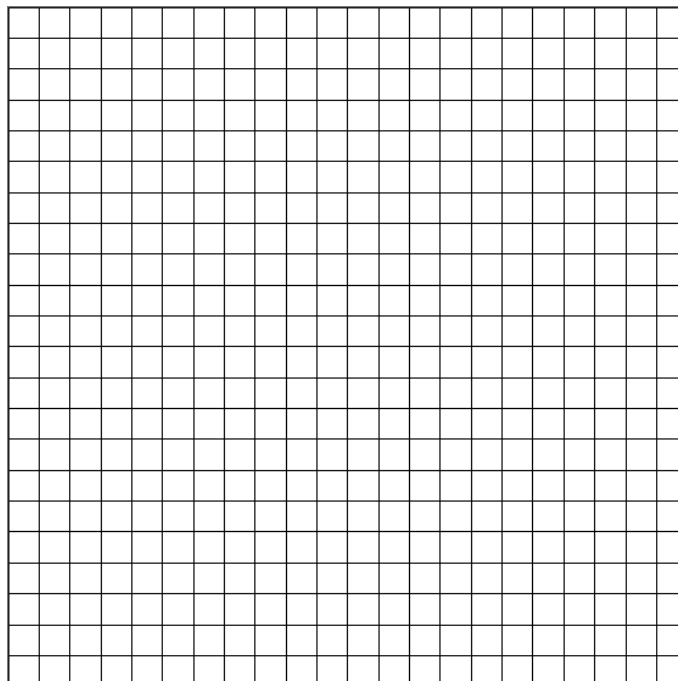
Hypothesis:

Procedure:
1. Open the internet browser and start the Pendulum Lab simulation at
http://phet.colorado.edu/simulations/sims.php?sim=Pendulum_Lab

2. Design a controlled experiment that determines how pendulum pullback angle affects period time.

3. Using the photogate timer, record the period time (round to 0.01) for 5 different pendulum pullback angles.

4. Graph pendulum length vs period time. Analyze your data, write your conclusion, and answer the questions.

Data
Controls:

Pullback angle (°)					
Period Time (sec)					

Conclusion

Questions
1. What is the dependent variable in this experiment? Explain.

2. What is the independent variable in this experiment? Explain.

3. What are the controls in this experiment? Explain.

Pendulums!
Kinetic vs Potential Energy

Learning Goals:
- Students will understand what affects the period of a pendulum.
- Students will construct a graph and analyze data.

Question: How does the pullback angle of a pendulum affect its period?
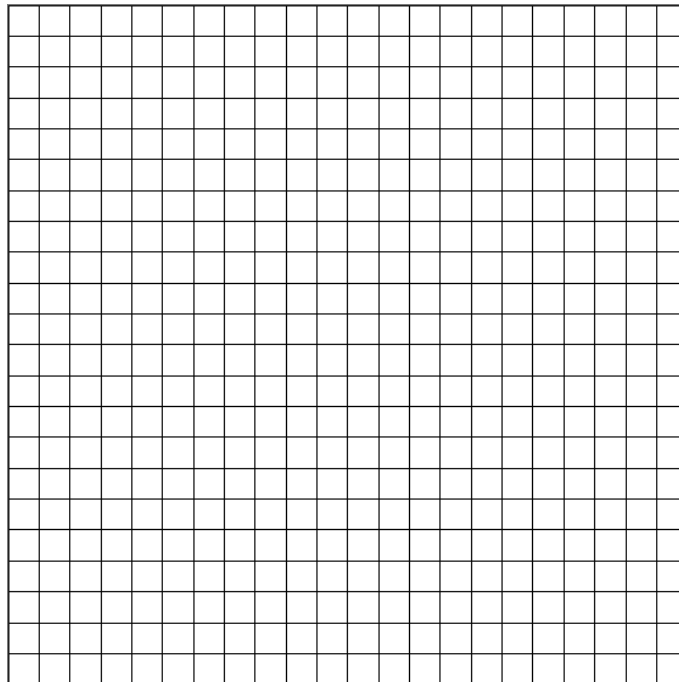
Hypothesis:

Procedure:
5. Open the internet browser and start the Pendulum Lab simulation at http://phet.colorado.edu/simulations/sims.php?sim=Pendulum_Lab

6. Design a controlled experiment that determines how pendulum pullback angle affects period time.

7. Using the photogate timer, record the period time (round to 0.01) for 5 different pendulum pullback angles.

8. Graph pendulum length vs period time. Analyze your data, write your conclusion, and answer the questions.

Data
Controls:

Pullback angle (°)					
Period Time (sec)					

Conclusion

Questions

4. What is the dependent variable in this experiment? Explain.

5. What is the independent variable in this experiment? Explain.

6. What are the controls in this experiment? Explain.

Pendulums!
Pullback Angle vs Period

Learning Goals:
- Students will understand what affects the period of a pendulum.
- Students will construct a graph and analyze data.

Question: How does the pullback angle of a pendulum affect its period?

Hypothesis:

Procedure:
9. Open the internet browser and start the Pendulum Lab simulation at
    http://phet.colorado.edu/simulations/sims.php?sim=Pendulum_Lab

10. Design a controlled experiment that determines how pendulum pullback angle affects period time.

11. Using the photogate timer, record the period time (round to 0.01) for 5 different pendulum pullback angles.

12. Graph pendulum length vs period time. Analyze your data, write your conclusion, and answer the questions.

Data
Controls:

Pullback angle (º)					
Period Time (sec)					
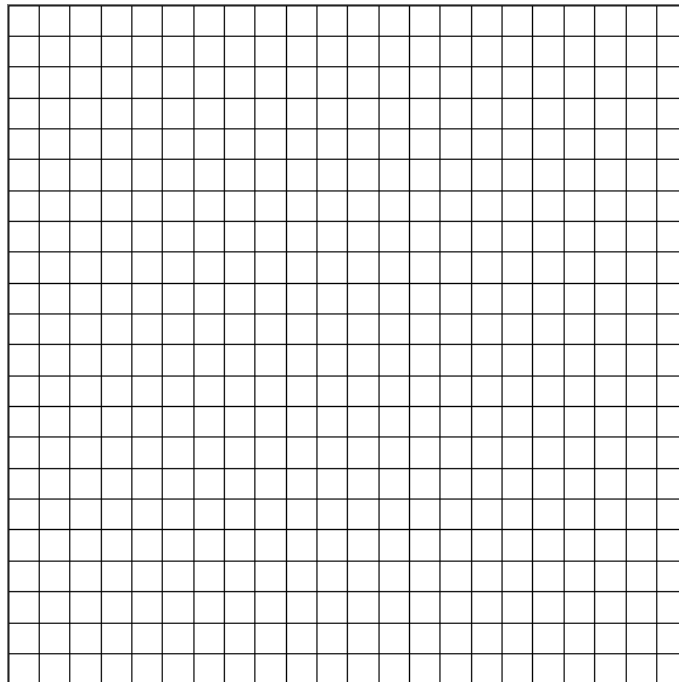
Conclusion

Questions

7. What is the dependent variable in this experiment? Explain.

8. What is the independent variable in this experiment? Explain.

9. What are the controls in this experiment? Explain.