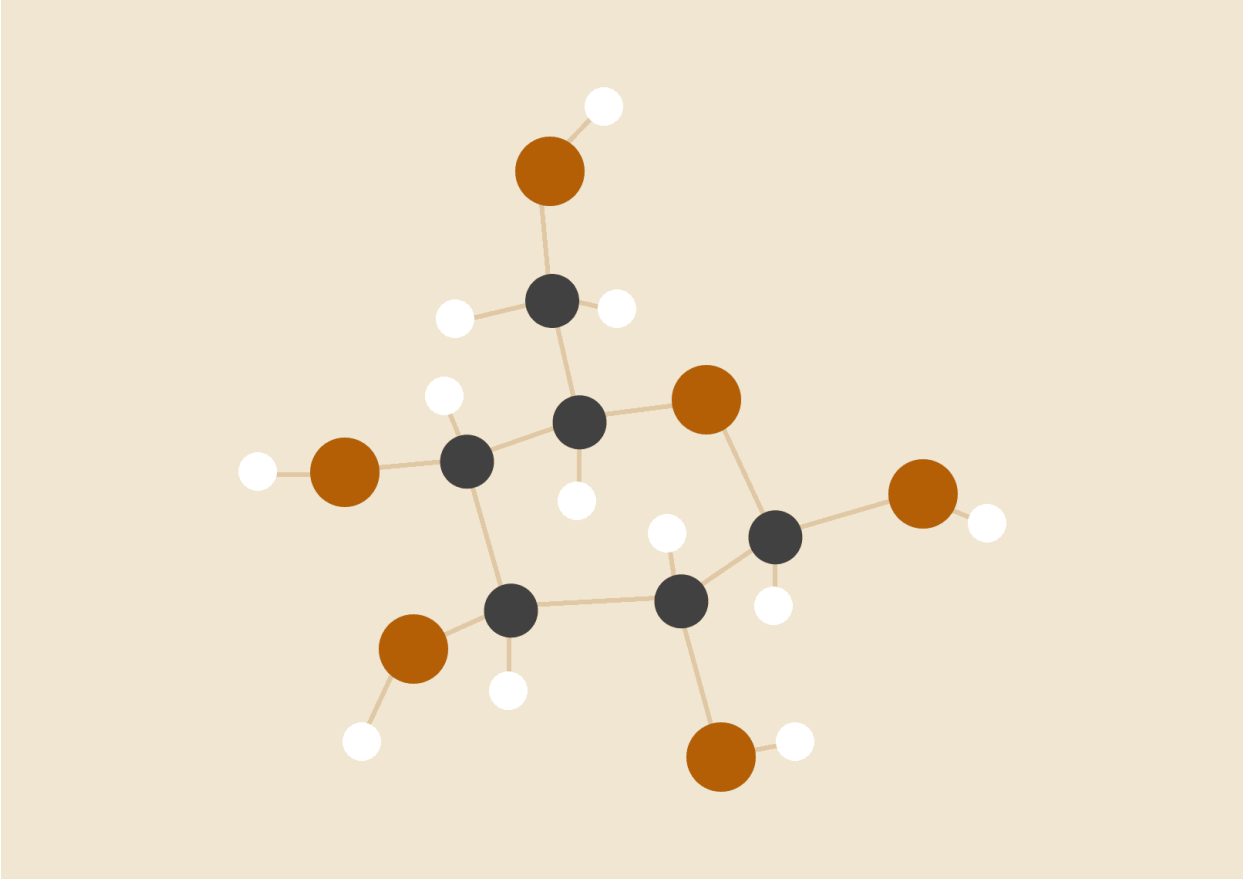
How does the length of a pendulum affect its period?

RISS Science Fair 2026



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12/3/2026

8TH GRADE SCIENCE

Research Question

How does the length of a pendulum affect its period?

This investigates the connection between the length of a pendulum and the time it takes it to complete one full swing (the period).

Background Information

A pendulum: is an object that swings back and forth from a fixed point. The time it takes for a pendulum to complete one full swing back and forth is called its period. Pendulums are affected by gravity and are used to study motion.

Energy:

What affects a pendulum in terms of **energy**, it is mainly affected by gravitational force and kinetic energy, as it swings it converts between the two types. Gravitational force on the way down in a curve until it hits its lowest point in the middle then there is a higher force of kinetic energy to drive it up again. But it will slow down eventually due to air resistance.

Sustainability:

The pendulum setup we will use is fully sustainable and has no harm to our planet as it uses no chemicals and does not release any gasses, it also dosent use

In the experiment we will measure how long it takes the pendulum to swing back and forth ten times, by changing the lengths of the penulums strings and timing its swings we can see how the lengths affect the period.

HYPOTHESIS

If the length of the pendulum is increased, then the period (time it takes for a full swing)

of the pendulum will increase because a longer pendulum has to travel a greater distance during each swing and there will be more air resistance on the longer strings meaning more surface area affecting it and slowing.

MATERIALS

1. Clamp stand
2. Clamp
3. String (5 lengths:)
4. Metal washer or small weight
5. Ruler or meter stick
6. Stopwatch

PROCEDURE

1. Set up the clamp stand and attach the clamp tight and secure.
2. Tie one end of the string to the clamp “fork” and the other end to the weight.
3. Measure the set length of the string from the clamp to the washer and record it.
4. Pull the pendulum to one (angle tbd) side and release it without pushing.
5. Use a stopwatch to measure the time it takes for the pendulum to swing back and forth 10 times.
6. Record the time in the data table.
7. Repeat the experiment with at least two different string lengths.
8. Repeat each trial two or three times for accuracy and calculate the average time.

DATA

Length of String (cm)	Time for 10 Swings (s)	Average Time (s)
30		
15		
10		

RESULTS

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CONCLUSION

The purpose of this experiment was to determine how the length of a pendulum affects its period.

My hypothesis stated that if the length of the pendulum is increased, then the period will increase because the pendulum has to travel a greater distance during each swing.

If my results support my hypothesis. The data willclearly show that longer pendulums took more time to complete 10 swings compared to shorter pendulums. Therefore, increasing the length of the string increases the period of the pendulum.

1 reason this happens is because gravity pulls on the pendulum, and a longer string causes the pendulum to move in a larger arc/curve. Even though the gravity stays the same the longer pendulum moves more slowly becauese.

REFERENCES

Science Textbook – Motion and Forces Chapter

NASA Glenn Research Center – Pendulum Motion

The Physics Classroom – Pendulum Motion Tutorial