

Foucault's Pendulum

Name: _____

Review the information on the About Foucault Pendulums website (<http://www.calacademy.org/products/pendulum/index.html>), from the California Academy of Sciences, to learn how the scientist, Jean Foucault, was able to prove that the earth rotates by building and observing the motion of a pendulum.

As you read each 1-2 page section, answer the questions below to help guide your understanding of the information.

What's a pendulum anyway?

- What is the definition of a pendulum?

- What are the parts of a pendulum?

- What effect does inertia have on a pendulum?

Why is a pendulum scientifically important?

- Why can pendulums be used for time keeping?

- Why is measuring the acceleration of gravity or "g" important?

- How do you think a pendulum can be used to show that the earth spins?

Wrong ideas: what people used to believe about the earth

- What were some of the early ideas about the earth that were later proven wrong?

- Who were some of the first scientists to believe the earth rotates?

Early experiments to prove the rotation of the earth

- What were some early experiments that try to prove the rotation of the earth?

- Why were these experiments inconclusive?

Foucault's three pendulum experiments

- Describe Foucault's three experiments. In each experiment, what were the length of the wire and the weight of the bob?

- Why did the longer wire result in longer and slower oscillations?

- What did Foucault use to show the how the plane of oscillation moved?

- Explain how this proved that the earth rotates.

How the Foucault pendulum works (California Academy of Sciences pendulum)

- Why would a pendulum normally stop after a few hours?

- What keeps the pendulum moving?

Why does the pendulum demonstrate the rotation of the earth?

- Describe how each of the following affects the movement of the pendulum:

- Inertia

- Gravity

- Air Resistance

- Why does the pendulum demonstrate the rotation of the earth?

What are the different kinds of motion around the earth's axis?

- Describe the motion of a pendulum and the building around the earth's axis under the following conditions:

- Perpendicular axis at the North Pole

- Parallel axis at the Equator

- What happens if the pendulum was at latitudes between the North Pole and the Equator?

- **How the rotation of the earth affects our lives**

- Describe how the earth's rotation affects the following:

- Plane flights

- Weather

How to figure the period of a simple pendulum

- Discuss the equation to calculate the period swing of a pendulum. What does each part of the equation represent?

- What is the period of swing?

- Define what is meant by the acceleration of gravity.

How to figure the number of degrees of rotation of the earth beneath the pendulum in 24 hours

- Discuss the equation to calculate the number of degrees the earth rotates beneath a pendulum in 24 hours. What does each part of the equation ($n = 360 \text{ degrees} \times \sin$ of latitude) represent?