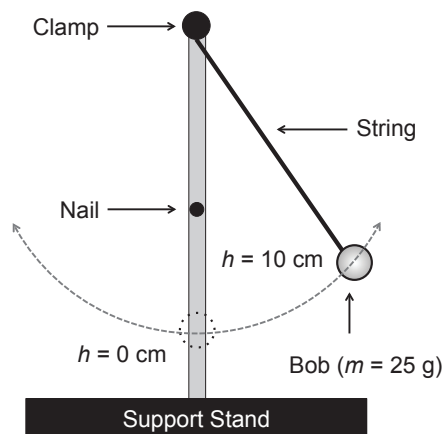


**Checkout Questions****Lab 21. Conservation of Energy and Pendulums: How Does Placing a Nail in the Path of a Pendulum Affect the Height of a Pendulum Swing?**

1. Pictured at right is a pendulum. Let  $h = 0$  represent the height when the bob is at equilibrium and acceleration due to gravity is  $9.8 \text{ m/s}^2$ . With these facts, calculate the kinetic energy of the bob when it is at the equilibrium position, assuming the pendulum is released from the point where  $h = 10 \text{ cm}$ .



2. The length of the pendulum has an effect on the height of the bob after contacting and sweeping through the nail (assuming the initial height is not higher than the nail).
  - a. I agree with this statement.
  - b. I disagree with this statement.

Explain your answer, using the findings from your investigation about placing a nail in the path of a pendulum.

# LAB 21

3. There is no difference between observations and inferences in science.
  - a. I agree with this statement.
  - b. I disagree with this statement.

Explain your answer, using an example from your investigation about placing a nail in the path of a pendulum.

4. Scientific knowledge can change over time.
  - a. I agree with this statement.
  - b. I disagree with this statement.

Explain your answer, using an example from your investigation about placing a nail in the path of a pendulum.

5. Scientists often look for or attempt to identify patterns in nature. Explain why this is a useful practice, using an example from your investigation about placing a nail in the path of a pendulum.

## Conservation of Energy and Pendulums

### *How Does Placing a Nail in the Path of a Pendulum Affect the Height of a Pendulum Swing?*

6. In science, understanding cause-and-effect relationships is an important goal. Sometimes, scientists hypothesize a causal relationship that is not supported by the data. Does this mean there was something wrong with the investigation? Explain your answer, using an example from your investigation about placing a nail in the path of a pendulum.

7. In a pendulum, energy is transferred from potential to kinetic energy. Discuss the relationship between the potential and kinetic energy of the pendulum as it swings back and forth. Is energy conserved? Why is it important to keep track of the energy as it is transferred from potential to kinetic energy?