

SCIENCE

ACTIVITY-13

TIME AND MOTION

Class: VII

Duration-30 minutes

Nature of activity: Individual

Learning Outcome: Students will be able to analyse that:

- (1) The time period of a pendulum does not depend on the extent to which the bob of the pendulum is displaced.
- (2) The time period of a pendulum does not depend on the mass of the bob used.
- (3) The time period depends on the length of the string used: greater the length of the string greater is the time period.
- (4) The time period of a simple pendulum is constant.

What we have to do?

To show the constancy of the time period of a pendulum.

What do we require?

A string, a metal ball (bob), an iron stand and a stopwatch.

What do I need to know?

The time taken by the bob to complete one oscillation is known as the time period.

Teacher's Activity: Teacher will arrange the materials for the individual and give instructions regarding the activity.

How will you proceed?

Student's Activity:

1. Take a string of nearly one metre and tie the metallic ball at one end. Tie the other end to a rigid support like the iron stand.
2. Displace the bob slightly and let it oscillate. Make sure it oscillates freely and does not touch against any object.
3. Use the stopwatch and note the time taken by it to complete ten oscillations.
4. Divide the time taken for ten oscillations by 10. This gives the time period of the pendulum. Repeat the experiment many times without changing the arrangement. Compare the values of the time periods obtained.

What have you observed?

- The time taken for 10 oscillations = t

What have you learned?

- The time period (T) of a simple pendulum is $T = 2\pi\sqrt{\frac{l}{g}}$

What more can we do?

- We can replace the bob with a stone and show that the time period does not depend on the mass of the bob.

Extended learning worksheet

Answer the following questions:

1. Given a seconds pendulum having a time period of 2 sec. What changes can you make to reduce the time period?

_____.

2. Calculate the time period of a simple pendulum if it takes 48 secs to complete 12 oscillations.

_____.

Q3. Name two devices which were used for measuring time in ancient times before pendulum clocks were made.

_____.

Q4. What type of motion is illustrated by the bob of a simple pendulum?

_____.

Q5. What name is given to the metallic ball of a simple pendulum?

_____.