Objective

To make a pendulum that ticks out time like a clock — 60 cycles per minute.

Introduction

Begin by leading your whole class in step 1. As the teacher, you play an essential time-keeping role. Be prepared to repeat this process in step 3.

Lesson Notes

1. Students attempt to guess how long one minute lasts while you keep time. To put everyone on an equal footing (except you, the timekeeper), be sure that all wristwatches are placed in pockets and all wall clocks are out of view. Begin with everyone seated. Tell students to stand when they think exactly 60 seconds have passed. Note who stood closest to the mark, but don't declare the winner until everyone is standing.

2. Masking tape makes an ideal pendulum pivot. Simply hold it in your hand to make the pendulum swing. The tape won't move relative to the thread, until you intentionally decide to pull it back or forward to create a new pendulum length. Through trial-and-error, it is possible to find just the right length adjustment, so the pendulum marks time with impressive accuracy.

Notice that the pendulum ticks out seconds in cycles (once back and forth), not swings. To investigate clocks that mark time in swings, see the "Extension" below.

3. Students guess the length of 1 minute again, this time aided by their pendulum clocks. If these clocks are accurate, your entire class should rise, in choir-like unison, near the 60 second mark.

Extension

Develop a slower clock pendulum that makes 1 *swing* every second.

a. Measure how many times the shorter *cycle*-per-second pendulum fits into this longer *swing*-per-second pendulum? (Four times. This relationship will be explored in greater detail in activity B-2.)

b. How long would it take your swing-per-second pendulum to complete 1 million swings?

1,000,000 s x 1 min/60 s x 1 hr/60 min x 1 day/24 hr
=11.57 days

Check Point

4. Yes. I estimated much closer to the 60 second mark when using the pendulum clock. So did the rest of the class because we all stood up nearly together at the 60 second mark.