A.1.1 Measurement Standards

Key Concepts:	Standardized Units
Materials:	Engraved meter scale
	Kilogram mass
	Kater pendulum and support
Set Up Time:	
Time Estimate:	

Set Up And Display

The items are displayed to illustrate the concept of a 'standard'. If desired, additional measurement standards can be shown. For example, a standardized thermometer for measuring temperature and a barometer for measuring pressure can also be demonstrated.

The engravings on the meter scale are hard to see. The scale should be illuminated and a magnifier should be provided. The mass should be polished. Metal polish can be borrowed from the Machine Shop.

Explanation

The main items are copies of national standards, which are copied from international standards. Two of these standards are drawn from natural or atomic standards. The meter is defined in terms of the speed of light and the second is defined as a set number of atomic vibrations. The meter and second are therefore indirectly derived standards. Only the kilogram standard is less precisely defined by a cylinder of platinum-iridium alloy. A natural or atomic basis is yet to be found for mass.

This demonstration is most often used at the start of the mechanics courses where distance, mass, and time are all that matter. The demonstration is meant to explain the importance of standards for scientific work.

Related Demonstrations: D 1.2