

Abstract Submitted
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Use of a Force Sensor in Archimedes' Principle Experiment, Determination of Buoyant Force and Acceleration Due To Gravity TARLOK SINGH AURORA, University of the Sciences, PA — In introductory physics, students verify Archimedes' principle by immersing an object in water in a container, with a side-spout to collect the displaced water, resulting in a large uncertainty, due to surface tension. A modified procedure was introduced, in which a plastic bucket is suspended from a force sensor, and an object hangs underneath the bucket. The object is immersed in water in a glass beaker (without any side spout), and the weight loss is measured with a computer-controlled force sensor. Instead of collecting the water displaced by the object, tap water was added to the bucket to compensate for the weight loss, and the Archimedes' principle was verified within less than a percent. With this apparatus, buoyant force was easily studied as a function of volume of displaced water; as well as a function of density of saline solution. By graphing buoyant force as a function of volume (or density of liquid), value of g was obtained from slope. Apparatus and sources of error will be discussed.

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