

OPERATING INSTRUCTIONS

AND SUGGESTED ACTIVITIES

TANGENT GALVANOMETER

TNGV01



Figure 1

DESCRIPTION

The Tangent Galvanometer (*Figure 1*) is a simple instrument for measuring electric currents using basic principles. It can also be used to obtain an approximate value for the local horizontal component of the Earth's magnetic field. It consists of an insulating stand (1) carrying two coils of wire (2) and a central platform with a compass (3). The coils are connected to an external circuit by three binding posts (4).

BACKGROUND

The properties of electric currents were explored during the early 19th century. One practical problem was to find methods to measure the strength of electric currents in terms of other known quantities. The tangent galvanometer, first designed in 1837 by French scientist Claude-Servais Mathias Pouillet (1790-1868) provided a solution by using the magnetic field of a current to measure its strength in terms of the Earth's magnetic field, then believed to be a handy constant value for any given location.

The tangent galvanometer relies on the fact that a freely suspended magnetic needle orients itself parallel the net local magnetic field. The instrument is set up so that the plane of its coils is parallel to the local direction of the horizontal component of the Earth's magnetic field (by using the suspended magnetic needle as a compass.) When a current is