Supplement for Physics 1415 Experiment 18
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Refer to "Introduction to Physical Science, Laboratory Guide" by Shipman, Wilson, & Todd
Amends Procedure 2 regarding dip needle

A dip needle is a finicky device and, even when performed successfully, it's difficult for beginners to understand the results. This replaces the dip needle portion of the experiment.

Equipment: Magnetic compass, drafting compass, ruler (straightedge), blank paper, pencil, protractor, bar magnet, & iron filings.

Procedure:
(1) Draw a circle to represent the Earth. Label north, south, and equator. Draw a diameter line between the north and south, along the equator, and at 45°. Sketch stick figures at the north (90° latitude), at the equator (0° latitude), and halfway between (45° latitude).
(2) Using the protractor, draw tangents at each stick figure. A tangent is 90° to the diameter and represents the surface of the Earth near each figure.
(3) Sketch what you believe the direction of the magnetic field is near each stick figure.
(4) Record the angle above or below the tangent that you think the magnet field is pointing.

	First Guess (Step 4)		Measurement (Step 6)	
Position	Angle	Magnetic field points (Above? / Below?) the surface of the Earth.	Angle	Magnetic field points (Above? / Below?) the surface of the Earth.
North				
45°				
Equator				

(5) Place a bar magnet along the north-south line in your drawing.
(6) Measure the angle the magnetic field makes with the surface of the Earth using a magnetic compass of iron filing and a protractor. Record data in above table.
(7) Compare the results of Step (4) and Step (6). How do they compare? Explain.

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(8) Have each group show the instructor the approximate direction, both laterally and vertically, of the magnetic field in your locale, at the North Pole, at 45° latitude, and at the equator. Instructor will record results below.

Students successfully demonstrated direction of magnetic field at:

Locale _____ Equator _____ 45° _____ North Pole _____

This concludes the supplement to your lab instructions. Return to your lab book for the remainder of the lab.