

Earth's Magnetic Field Worksheet

Part A. Modeling the Earth's Magnetic Fields

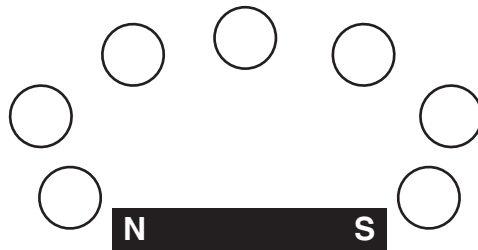
Observations of the interactions of the iron filings and sphere:

Observations when the iron filings are moved away from the poles of the magnetic sphere:

Compass and sphere observations:

Part B. Bar Magnet and Magnetic Fields

Fill in each circle to indicate the direction the red tip of the compass needle points as the compass is moved around the magnet.



Draw the location and appearance of the magnetic field lines around the magnet.



Post-Lab Questions *(Answer on a separate sheet of paper.)*

Part A.

1. Was the magnetic field the same over the entire surface of the sphere?
2. What happened to the iron filings when they were positioned over the poles of the sphere?
3. How were the iron filings arranged in the Petri dish when they were positioned midway between the poles of the sphere?
4. What happened to the iron filings when the Petri dish was moved upwards away from the poles of the sphere? Does this show a change of strength or direction of the magnetic field?
5. What happened to the compass when it was placed directly over the poles of the sphere?
6. Is the magnetic field surrounding the sphere a three dimensional field? Explain your answer.

Part B.

1. How does the direction of the compass needle change as the compass is moved along the magnetic field?
2. How do the iron filings align themselves in relation to the magnetic field? Do the magnetic lines ever cross?
3. Where is the magnetic field the strongest? How can you tell? Compare the strength of the magnetic field to the closeness of the magnetic field lines in that region.