Electricity and Magnetism Worksheet Key, Part 3

Name: ______________________________

1. Which end of your nail points to the north? head or point (circle one).
   This answer will be different for each group because it depends on the orientation of the magnet with respect to the nail.

   2. What happened to the “compass needle” when a current is allowed to flow in the wire?

   The needle is deflected (moves) when the current is allowed to flow.

3. Insert one end of the iron wire into the straw with coil. What happens when a current is allowed to flow in the wire?

   The iron wire is drawn into the straw (inside the coil) when the current is allowed to flow.

4. How many paper clips can you pick up with your electromagnet? ___________

5. Draw what happens to your “needle” when you place the nail with the coil next to it and let the current flow:

   Side view: Depending on which end is N and S, the “needle” will align parallel or anti-parallel to the energized coil. When the battery polarity is switched, the “needle” will change its orientation by 180°.
Again, depending on which end is N and S, the “needle” will align parallel or anti-parallel to the energized coil. When the battery polarity is switched, the “needle” will change its orientation by 180°.

How would you mark N and S on the nail with the coil?

This answer will depend on which end of the “needle” was determined to be the north pole. As the current is applied and the “needle” aligns with the nail in the coil, the N end of the coil nail can be identified. This pole will switch when the battery polarity is switched.

Underline the correct answer in the sentence below:

The direction of the magnetic field (changes does not change) when the battery connections are reversed.