Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hour \_\_\_\_\_\_\_\_

Purple **Magnetism Station 4: NDT Magnetism**

**Part 1:** Pre-lab Questions; answer the following questions using complete sentences with a restate

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| 1. Draw what you think Earth’s magnetic field looks like. |
| 2. Where can you find magnetic fields in the classroom?  3. Where can you find magnetic field in the world? |
|  |
| **Part 2:**  1. Get your ASSIGNED Chromebook and on my blog you will find a link for “Electricity and Magnetism”. Click on the link <https://www.nde-ed.org/EducationResources/HighSchool/Magnetism/magnetismintro.htm>    2. Each page and answer the questions using complete sentences with a restate  Introduction to the Mystery of Magnetism  A. What are three common items that rely on magnetism to work?  -  -  -  Magnetic Behavior  A. What is the simulation showing you?  B. What is a magnet?  C. What is magnetism?\*  Magnetic Properties  A. Use the scissors to cut the magnet  B. How many cuts can you do before the magnet no longer acts like a magnet?  Review of the Atom  A. Has the model of the atom always been the same? Explain\*  B. How is the Earth similar to an atom?  Creation of Magnetic Fields  A. Define a magnetic field  Electron Pairing  A. What are paired electrons?  Magnetic Domain  A. Click and Drag the magnet across the metallic strip.  B. What is happening to the piece of metal?    C. Could you turn a paperclip into a magnet? Explain.  The Two Ends of A Magnet  A. Click “start Animation” on experiment 1  B. Describe or draw what happened  C. Click “start Animation” on experiment 2  D. Describe or draw what happened  E. Click on “start Animation” on experiment 3  F. Describe or draw what happened  G. What is the needle of a magnet?  H. How are the Earth and a magnet similar?  I. Describe what you are seeing in the last picture  Magnetic Lines of Force  A. Review the picture and go on to the next slide  Magnetic Fields  A. Read the description above Box A  B. Read the descriptions for each Box and review the pictures.  C. What patterns do you notice about each picture?  D. Are the iron particles magnetized? How do you know?  Ferromagnetic Materials  A. Review the demonstration and move on  Electromagnets  A. Click on the “Raise/Lower” lever to start the animation  B. Describe an electromagnet.  **The rest of the Part 2 simulation will be counted as extra credit. Move on to Part 3 (not extra credit) of the assignment before completing the extra credit.**  Electricity and Magnetism  1. What happens to the compass needle as the compass moves around the wire carrying electrical current?  2. Why do you think this happens?  More on Electricity and Magnetism  1.If electricity produces magnetism, can magnets produce electricity?  2. Why is electromagnetic induction important to us?  3. How does a magnet help a generator convert mechanical energy into electrical energy?  Magnetism and the Direction of Current Flow  1. What happens each time you reverse the electrical current in the wire?  2. What would happen if we used alternating current (AC) instead of direct current (DC) in the wire?  The Electric Motor and Magnetism  1. How does magnetism make an electric motor operate?  The Use of Magnetism in NDT  1. How is magnetism used in NDT?  **Part 3:**   1. Go to <http://phet.colorado.edu/en/simulation/faraday> or google “PHET faraday . The link can also be found on my blog 2. Select the “pickup coil” tab. 3. Make the light bulb light. Describe what you have to do to keep the light bulb glowing. 4. To make the bulb light you must have moving electrons. What do you have to do with the magnet to make the electrons move? 5. A generator “makes” electricity. Click on the “generator” tab.    1. Turn on the water. What does the water do to the magnet?    2. Turning on the water does cause the light bulb to light, but is water necessary to “make” electricity? [ yes / no ]    3. If there is no water but you have a magnet, a coil of wire, and a light bulb what would you do to make the bulb light?    4. Explain and draw a possible set up for what the power company has at the power plant to “make” electricity for this school. |