KUTZTOWN UNIVERSITY

ELEMENTARY EDUCATION DEPARTMENT

PROFESSIONAL SEMESTER PROGRAM

Teacher Candidate: Paige Weaver Date: 3/18/15

Cooperating Teacher: Dr. White Coop. Initials

Group Size: Small group Allotted Time 45 minutes Grade Level Third Grade

Subject or Topic: Magnetism Section

STANDARD: (PA Common Core):

**S3.C.3.1:** Observe and identify changes in an object’s motion.

**3.2.3.B4:** Identify and classify objects and materials as magnetic or non-magnetic.

**S3.A.2.1.1:** Generate questions about objects, organisms, or events that can be answered through scientific investigations.

I. Performance Objectives (Learning Outcomes)

1. The third grade students will be able to identify that objects that have a magnetic pull on them (natural force) can change direction by completing a journal entry.
2. The third grade students will be able to ask questions based on their observations by completing a journal entry.
3. The third grade students will be able to identify the earth as being magnetic or non-magnetic by completing a journal entry.

II. Instructional Materials

A. Steel straight pins (one per group)

B. Circular magnets (one per group)

C. Copy of handout of magnetized pin; pg. 16 (one per student)

D. Small Styrofoam chips

E. Aluminum pie plates, filled partially with water (one per group)

F. 1 Compass

G. Pinch of iron filing in plastic container (one per group)

III. Subject Matter/ Content (prerequisite skills, key vocabulary, big idea, New Content)

1. Prerequisite Skills
   1. The earth has a magnetic field along with a north and south pole
   2. Any metal can become magnetized using magnetite
   3. A compass always points north because it uses a magnet
   4. Good scientists generate questions and make observations to conduct scientific inquiry
2. Key Vocabulary
3. Magnetite- A brown to black mineral that is strongly magnetic; Magnetite occurs in many different types of rock and is an important source of iron.
4. Magnetic field- A region of space near a magnet, electric current, or moving charged particle in which a magnetic force acts on any other magnet, electric current, or moving charged particle.
5. Compass- An instrument for determining directions, as by means of a freely rotating magnetized needle that indicates magnetic north.
6. Big Idea- Scientific discovery through magnetism
7. New Content
8. Why does a compass point north?
   1. Earth has a magnetic field with a north and south pole
   2. Compasses are used for navigation
   3. Objects that have a magnetic pull on them (natural force) can change direction
9. How can a non-magnetic metal become magnetized
   1. Magnetite
10. Observation- ask testable question, record findings, and ask questions for further inquiry

IV. Implementation

A. Introduction –

1. Scenario: "You are each on a ship in the middle of the ocean and you need to get to an island directly to the north, but just as a huge wave hits your ship, you stumble and accidentally drop your only compass into the water! Luckily, you find the following materials in the storage area of your ship (bring out bins of materials). How can you use these materials to find north and get to the island by nightfall?"
2. Explain that each group will work together to make a compass to find north because compasses are used for navigation.
3. Remind students that as scientists who are trying to solve a problem, they need to be good observers. Ask the students to take 5 minutes and brainstorm in their groups how they will be good observers.
4. Follow up with giving your own example of how you would be a good observer by writing down details such as what and how. State that good observers also use all of their senses.
5. Take 5 minutes and brainstorm as a class what testable question the scientists will be working to answer today. Review what a testable question is and give an example that uses their previous experience: How can I make the light bulb light up? (How can I use the given materials to find which way is North?)
6. Review rules and safety about working with these materials in groups.

B. Development –

1. Allow students 5 minutes to brainstorm as a group how they can use the materials to discover which way is north.
2. After the 5 minutes, announce that one of the members of the crew has just found a hint scrawled on a piece of paper! Distribute the magnetized pin handout and explain that rubbing it in one direction about 50 times with the circular magnet can magnetize the pin. Demonstrate this for better understanding including review on how atoms within the pin become magnetized.
3. Students will take turns magnetizing the pin for about 5 minutes.
4. Provide students with small container of iron filings and explain that they can test their created magnet by attracting the iron filings.
5. Allow students 10 to 15 minutes to use the given materials to assemble their compass and use it to find north. Provide assistance when needed.
6. When all of the groups have successfully assembled and tested their compasses, clarify by having each group compare theirs with the compass provided. Discuss this comparison with each group as you walk the room during this time.
7. Bring class together and ask for student volunteers to each draw a part of a diagram of the compass on the white board.
8. Why does a compass point north? (Pose question to class)
9. Explain that a compass proves that the earth in fact has a magnetic field and just like opposite poles attract, the south pole of a compass will point to the north pole of the earth.

C. Closure –

1. Ask students to brainstorm in their groups why it is important to record observations and ask questions during those observations. How does that make you a good scientist? Bring class together and have each groups share at least one idea. (Recording results, asking questions, discussion)

2. Have students complete a page in their journal including a drawing, procedure, conclusion, and at least one future question.

D. Accommodations / Differentiation -

1. Student learning levels will be considered when making groups.
2. Evaluations will be completed orally with the teacher scribing the students’ answers.

E. Assessment/Evaluation plan

1. Formative

1. Student journals will be completed to demonstrate the classification of the earth as either magnetic or non-magnetic. A checklist will be used to document learning by either a check plus or a check minus.
2. Student journals will be completed to demonstrate that objects that have a magnetic pull on them (natural force) can change direction. A checklist will be used to document learning by either a check plus or a check minus.
3. Students will demonstrate their knowledge of how to conduct good scientific investigations by asking at least one future question based on observations recorded in their journal entries. A checklist will be used to document learning by either a check plus or a check minus.

V. Reflective Response

A. Report of Students’ Performance in Terms of States Objectives (Reflection on students performance written after lesson is taught, includes remediation for students who failed to meet acceptable level of achievement)

1. Personal Reflection(Question written before lesson is taught.)(Reflective answers to questions recorded after lesson is taught.)
2. Did the lesson fit in the time allotted? If not, why?
3. Did the students achieve the expectations of the objectives? What evidence supports this conclusion?
4. What could I have done differently to enhance my students’ learning?
5. Were the students actively engaged in the activity? What could have been done differently to enhance engagement?

VI. Resources

1. Young, R.M. (2009) *Magnets & Electricity Super Science Activities.* Westminster, CA: Teacher Created Resources, Inc.

Student Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| Assessment in Journal Entry Response | Meets Requirements | Does Not Meet Requirements |
| Did the students ask at least one future question? |  |  |
| Was the student able to identify that the earth is magnetic? |  |  |
| Was the student able to identify that the pin changed motion (direction) when a magnetic force acted upon it? |  |  |

Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Comments/Observations:

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