

Building a Compass

A: Informational Components

Lesson Title: Building a Compass

Grade Level: 5th Grade

State Standards Connection: Students will understand that magnetism can be observed when there is an interaction between the magnetic fields of magnets or between a magnet and materials made of iron.

Objective: 2 Describe how the magnetic field of Earth and a magnet are similar.

Indicator: c Construct a compass and explain how it works.

Essential Question: How can understanding how magnets and the magnetic field of the earth help us find direction.

Specific Lesson Objective: Students will construct a model of a functioning compass to have practice understanding how the earth's magnetic fields work.

Vocabulary Focus: Magnetic North, Fields.

Materials: Each group: Variety of Magnets, Needle that has been magnetized, plastic cup, water, glue, iron shavings.

Anticipated Time Frame: 40 Minutes

B: Instructional Procedures

Engage and Launch: Tell engaging story of magnetic termite mounds found in Northern Australia. Explain how we were able to use those mounds to get our bearings and find out what direction we needed to be headed and where we came from. Let's try and be like an ant and find magnetic north. 5 Minutes.

Teacher role – Pose problems.

Student role – Has an interest and identifies problem to solve.

Explore: Students will be asked to divide into their groups that have been determined to be most effective by the classroom teacher. A representative of each group will come to the front of the classroom and pick up the materials they will need that are prepared for them in plastic bags. The students will need to turn their Magnets worksheet to the "Building a Compass" page. As the students are exploring how to build their compass, the teacher will be roaming the room encouraging their ideas and asking probing questions that should lead them towards the construction of a simple functioning compass. 15 Minutes.

Teacher role – Makes Open Suggestions, Questions and probes.

Student role – Explores resources and materials, Hypothesizes and predicts, Designs and plans.

Explain/Summarize: As groups complete their compass, instruct them to put their materials away and each person in the group is to turn to their Building a Compass worksheet and together as a group discuss the steps and the reasoning for each step that were required to create their compass. When all of the groups have finished with their compass, ensure that all the materials have been put away and that all students have their reflective worksheet in-front of them. Together as a class, we will fill out the worksheet using the doc cam so that students can see what is being written. 10 minutes.

Teacher role – Asks for evidence and clarification from students, Enhances or clarifies student explanations, evaluates student explanations.

Student role – Clarifies understandings discovered, Shares understandings for feedback, Communicates understandings using recorded observations.

Elaborate/Extend: Pose new challenge to students. Have students turn to the back of their worksheets and have them draw their design for a new compass if their owly materials were a bar magnet and string. Teacher will roam the room to assist students with their questions. 5 minutes.

Teacher role – Provides feedback, Enhances or clarifies explanations.

Student role – Applies new knowledge by performing related tasks.

Evaluate/Assess: Ask students to stop their work and ask the students to answer the last question on their worksheet. This is a summative assessment that will allow the teacher to assess their understanding of the earth's magnetic fields. Formative assessments will be conducted throughout the lesson as the teacher asks questions and interacts with the students. 5 minutes.

Teacher role – Allows students to assess their own learning and skills.

Student role – Demonstrates an understanding of a skill or concept.

Adaptations for Gifted/Talented, ELL and Special Education: Students with special needs and ELL students will be paid particular attention to ensure that they are engaged in a productive struggle. If necessary, thoughtful consideration will be given to who are in their groups to ensure they will not be left out of the experience. Gifted and Talented students will be encouraged to work at their own pace and if necessary more complicated problems will be posed to them.

Handouts (attach)