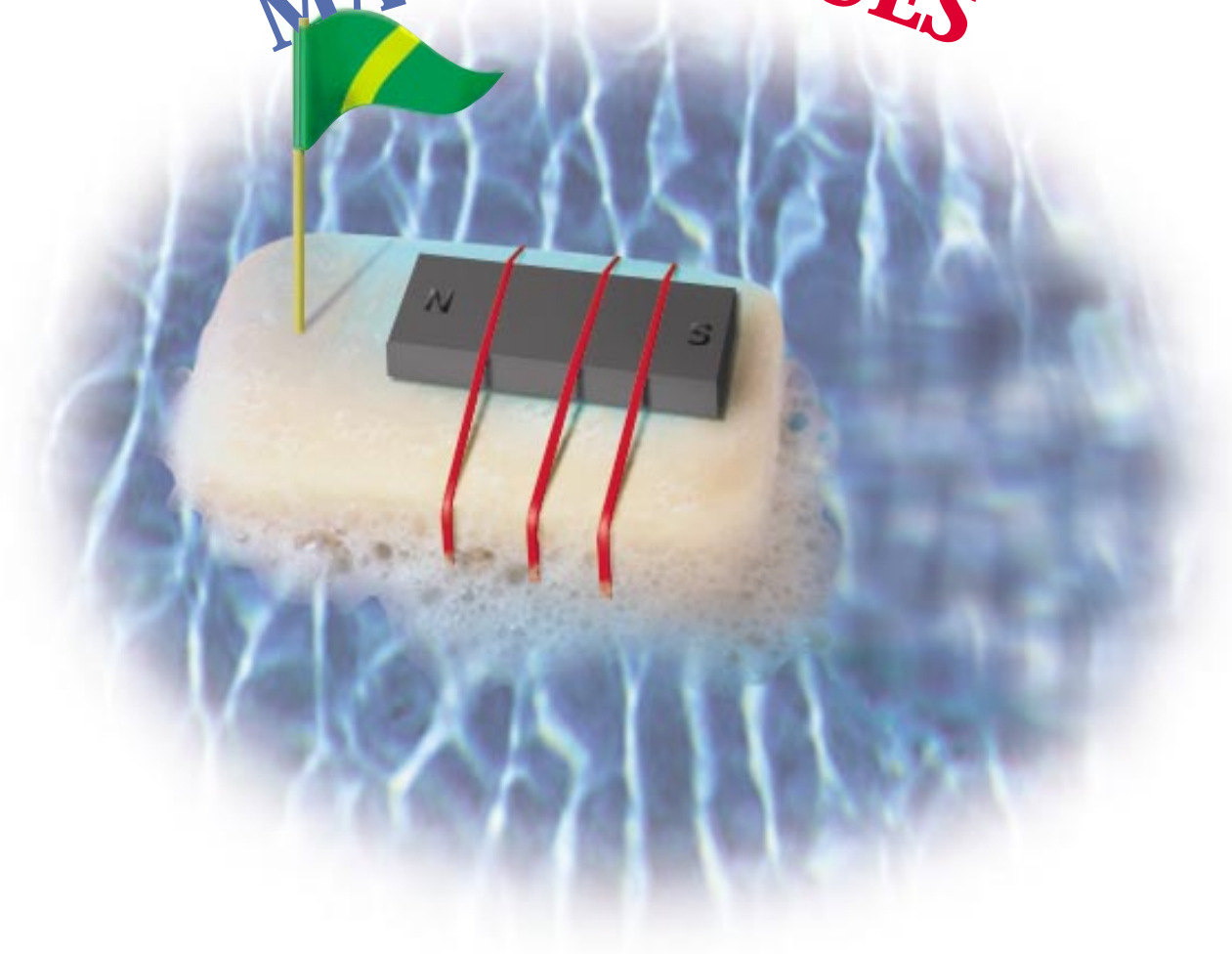


MAGNET RACES



GRADES K - 2

MAGNET RACES

SNC - Plant Farley LESSON PLAN

Lesson Title: Magnet Races

Lesson Description: Students build "Racing Boats" out of soap and bar magnets. They reinforce the concepts of magnetic attraction and repulsion as well as magnetic poles.

Grade Level: K-2 (modify as needed for each grade level)

Subject Area(s): Physical Science, Earth Science

Objectives: Students will:

- gain an understanding of the concept of magnetic attraction and repulsion.
- observe, record, and analyze factors that influence "race outcomes."
- gain a basic understanding of magnetic poles.
- build and use magnetic racers.

Materials:

- bars of Ivory soap, one per student
- small bar magnets (must be shorter than the length of the bars of soap. One per student
- strong rubber bands
- larger bar magnets (about 6"), one per student
- large container of water such as a wading pool
- materials to decorate the racers such as small strips of plastic or thin cloth to use as sails, toothpicks for masts, etc.
- activity sheets

Correlations (NSES):

- Content Standard A – Science as Inquiry
 - develop abilities to do scientific inquiry
 - develop understandings about scientific inquiry
- Content Standard B – Physical Science
 - develop an understanding of properties of objects and materials
 - develop an understanding of properties of earth materials
- Content Standard E – Science and Technology
 - develop abilities technological design
 - develop understanding about science and technology
- Content Standard F – Science in Personal and Social Perspectives
 - develop understanding of types of resources

Curriculum Integration:

- Environmental Science (natural resources)

Process Skills:

- Observation
- Comparison
- Collection of data
- Measurement
- Research
- Inference
- Investigation/experimentation
- Interpretation of data
- Analysis of data
- Description of findings
- Communication of ideas

Background Information:

- Main ideas
 - Principles related to magnets such as:
 - magnets have the ability to attract certain objects, including other magnets
 - magnets have poles
 - opposite magnetic poles attract while like magnetic poles repel
 - are natural structures
 - magnets cannot attract or repel all objects, only those that are made of certain metals
- Secondary ideas
 - Uses of magnets in industry and technology
 - Different types of magnets

Teacher Activities:

- Assemble/organize all materials needed for activity. Set up the wading pool ahead of time.
- Test the small magnets ahead of time to make certain they are not too heavy and can be supported by the soap.
- Prepare a “Magnet Racer” ahead of time so that you can show it to the students.
- Present background material to students. Demonstrate attraction, repulsion and polarity to students using the larger bar magnets.
- Depending on the size of the class, the teacher may wish to divide the class into teams or 2 students. Each student in the group should have a specific task in the exercise.
- Issue instructions to students regarding experiment.
- Distribute Activity Sheets to students and give instructions on how to complete them.
- Monitor/assist students as needed while constructing their “Magnet Racers”.
- Move around to each team to assist and answer questions.
- You may wish to appoint a “Judge” to blow a whistle to start the race and help determine a winner in each “heat”.
- The actual races will be conducted by the students “pulling” or “pushing” their “Racer” using the large bar magnet to attract or push. Remind students about attraction, repulsion forces. Have students line up their “Racers” on one side of the pool and race them toward the finish line on the opposite side of the pool. The students in the race will kneel alongside the wading pool to be able to reach the bar magnets close enough to their “Racer” to attract or push it. They are actually leading (or pushing) their “Racer” toward the finish line. This may take a little practice as students must learn they have to keep their larger bar magnets in close proximity to the magnets on their “Racers”.
- Naturally, you will have to let students have several races as not all will have room to race at the same time. You may wish to have “heats” and elimination races to determine a class winner.
- After students have shared their work, engage students in post-activity discussion. Stress main points of lesson during discussion.
- If time permits you may wish to demonstrate other types of magnets (e.g., horseshoe, disc, etc.) to the students.

Student Activities:

- Listen to background information given by teacher.
- Obtain all materials needed to complete the exercise (refer to Activity Sheet).
- Build “Magnet Racers” as directed by the teacher.
- Participate in racers as directed by teacher.
- Observe races when others are competing.
- Interpret/analyze race results.
- Participate in post-activity discussion.

Evaluation:

- Activity sheets
- Direct observation

Extension/Enrichment:

- Have students utilize different types magnets
- Have students build electromagnets
- Have students complete reports on magnets
- Engage students in a “Magnet Hunt” on the WWW

Safety Considerations:

- Use caution with glass microscope slides and coverslips. They have sharp edges and will inflict cuts.
- Light sources ion microscopes can get very hot. Caution students about touching hot parts of the microscopes.
- Students with cuts or open sores on their hands/fingers should wear gloves when handling pond water.
- Insist that students wash their hands after this exercise.

MAGNET RACERS

ACTIVITY SHEET ONE

(READ THIS ENTIRE SHEET BEFORE BEGINNING THE EXERCISE)

Introduction

Magnets have the power to attract pieces of metal or other magnets. You will be using magnets to build “Race Boats” today.

Your teacher has talked to you about magnets and that they have poles. Now you can begin to build your “Magnet Racer”.

Procedure

- Get the following materials as directed by your teacher:
 - a bar of soap
 - a little magnet
 - a big magnet
 - 3 rubber bands
 - decorations for your Magnet Racer
- Listen to your teacher carefully as she tells you how to start the lab activity.
- Put the little magnet on top of the bar of soap and put three rubber bands around it to hold it on.
- Decorate your Magnet Racer like your teacher tells you. Your Magnet Racer should look like the one at the bottom of this page.
- Listen to your teacher explain how to race.

