WE'RE OFF TO THE RACES!

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Lesson Summary for Grade 2

In this activity, students use a magnet to "race" objects from one side of a racing track to another. They predict what the results will be, then run the race. After sorting and graphing which items were successfully moved, they attempt the race again. However this time, they use their problem-solving skills by attaching the non-magnetic items to the magnetic items. Cross-curricular links are provided for math, literature, and art.

Science Activity: We're Off to the Races

Students learn that some objects are attracted to magnets and others are not.

Key Science Topics:

- magnetism

Key Process Skills:

- predicting
- sorting
- graphing

National Science Standards:
Science as Inquiry Standards

- Abilities necessary to do scientific inquiry. Students conduct a simple experiment to determine whether or not an object is attracted to a magnet.

Physical Science Standards

- An observable property of some materials (metallic objects containing iron) is that they are attracted to a magnet.

Ohio Proficiency Learning Outcomes for Science:
Fourth Grade

I-1	Create and/or use categories to organize a set of objects, organisms or phenomena.
I-4	Use a simple key to distinguish between objects.
I-6	Evaluate a simple procedure to carry out an exploration.
I-8	Evaluate observations and measurements made by other persons.
I-9	Demonstrate an understanding of safe use of materials and/or devices in science activities.
II-2	Explain or predict the motion of objects and/or describe the effects of some objects on other objects.

Sixth Grade

I-1	Use a simple key to classify objects, organisms, and/or phenomena.
I-3	Make inferences from observations of phenomena and/or events.
I-5	Evaluate conclusions based on scientific data.

Materials

Per group:

- 1 cardboard tray (obtained from school cafeteria)
- 1 magnet
- 5–10 small objects (coins, paper clips, erasers, etc.). Some should be attracted to a magnet, some should not.
- 2 blocks of equal height
- 2 pieces of tape

Procedure Notes

1. If you have enough materials, this exercise can be done individually. However, groups of two are ideal for the problem-solving extension.
2. Give each group an equal number of objects. Make sure that each group has some that are attracted to a magnet and some that are not.

Procedure

1. Pass out the "We're Off to the Races" record sheet. Have the students record the objects they have been given.
2. Give each group their racing board. Each board should be marked with a green start line 1 inch from one side and a red stop line 1 inch from the other side.
3. Use the blocks to suspend the boards over the desk. Each block should be at the end of the board (one in front of the start line, one behind the finish line).
4. Instruct the group to place their objects behind the start line.
5. At your signal, ask the groups to place their magnets under their board and move as many objects as they can from the start line to the finish line.
6. Have the students record which items they were able to move and which they were not.
7. Entertain hypotheses about why certain items could be moved and others couldn't.

Problem-Solving Extension

8. Ask the students to return all objects to the starting line. Explain to them you will give them another try to increase the number of items that are moved across.
9. Pass out two pieces of tape per group. Explain that they may use this tape however they wish to set up their objects at the starting line. (You are hoping that they will tape non-magnetic objects to magnetic objects.)
10. Repeat steps 5, 6, and 7.

11. Since students are quick to conclude that all metals are magnetic, make sure you have some examples that are not. Help them to conclude that only certain metals are magnetic.
12. Have the students fill in their final responses on their record sheet concerning their conclusions about items attracted to magnets. A sample answer can be written on the board, if necessary.

Math Activity

Students record data on a bar graph.

Ohio Proficiency Learning Outcomes for Math
Fourth Grade

VIII-21	Collect data, create a table, picture graph, bar graph, circle graph or line graph and use them to solve application problems.
VIII-22	Read, interpret and use tables, charts, maps, and graphs to identify patterns, note trends, and draw conclusions.

Sixth Grade

VIII-24	Make or use a table to record and sort information.

Have students do a bar graph of the number of items attracted to magnets versus the number of items not attracted, before and after the use of the tape.

Literature Activity

Students read The Berenstain Bears Are Off to the Races *and write a fictional story about their own racing adventure.*

Ohio Proficiency Learning Outcomes for Reading
Fourth Grade

III-11	Students will summarize the text.
III-14	Identify and interpret vocabulary words critical to the meaning to the text.
IV-16	Analyze the text.
IV-18	Respond to the text.

Ohio Proficiency Learning Outcomes for Writing
Fourth Grade

I-1	A response that stays on topic.
I-2	The use of details to support the topic.
II-3	An organized and logical response that flows naturally and has a beginning middle, and an end.
III-4	The use of a variety of words.
III-5	The use of a variety of sentence patterns.
III-6	A response that shows an awareness of word usage.
IV-7	A response that shows an awareness of spelling patterns for commonly used words.
IV-8	Legible writing in print or cursive.
IV-9	The correct use of capital letters and end punctuation.

Read aloud or provide copies to read *The Berenstain Bears Are Off to the Races* (by Stan and Jan Berenstain). In the second grade, there is a lot of focus on the narrative (fictional and personal) mode of writing. After reading the book, ask the students to complete their own fictional narrative about a race adventure. You may wish to require that a certain number of vocabulary words be used in the story. The students may illustrate and assemble their story into a book. They should also have the opportunity to read it aloud to the class and have it available for other classmates to read.

Art Activity

Students create a painting by using a magnet to swirl a paper clip and paint drops in a pie plate.

Materials

Per group:

- aluminum pie pan
- magnet
- several paper clips
- paints

Before the art activity, show samples of artwork by Jackson Pollock. This will motivate them for the following art activity.

In this activity, students will paint a design in their pan using the magnets. Several drops of paint (in various colors) will be placed inside the pan. Students can swirl these colors around by placing a paper clip inside the paint blob. On the back of the pan, they run the magnet around to smear the paint in their intended directions. Retrieve the clips and let the paint dry.

We're Off to the Races

Draw and name each item	Do you think this will be attracted to a magnet?	Was this attracted to a magnet?

Which of your items were attracted to magnets?

_____

_____

What do these items have in common?

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_____

What causes objects to be attracted to magnets?

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