

Compasses and Magnets

Overview Students will use a compass to complete a scavenger hunt. At the culmination of the scavenger hunt, they will learn how to build their own compass. They will make a connection between compasses and magnetism by completing a concept map.

Lesson Planner

Time Required	1 hour
Key Concepts/Terms	Compass, Magnet
Prerequisites	<ul style="list-style-type: none">• Knowledge of how to create a concept map• Knowledge of expectations for outdoor classroom conduct.
Setting	<ul style="list-style-type: none">• 40-minute field study outside• Remainder of lesson inside

Standards MD VSC 6th Grade Science
5.C.3.d. Based on investigations describe that electricity moving through a wire produces a magnetic force on materials placed near the wire.

- Iron filings
- *Compasses*

Objectives Students will use a compass to complete a scavenger hunt, create a compass outdoors, and determine the connection between compasses and magnetism.

**Materials
Required**

- Compasses
- Pencils with scrap paper
- Materials for creating compasses
- Chart paper
- Multiple class sets of colored utensils (i.e. 20 red markers, 20 blue markers, 20 purple markers, etc.)
- Materials to set up scavenger hunt

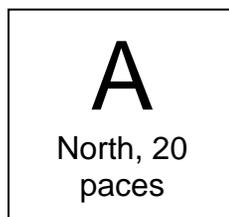
**Background
Information**

There are many sites on-line that describe how to make a compass, like this one: <http://www.madsci.org/experiments/archive/860218908.Es.html>. Be sure to cover the connection between the compass and magnets as magnetism is more specifically the standard sixth graders are supposed to learn. Bring in a conversation about the Earth's magnetic poles.

Set up scavenger hunt the day before or the morning of the lesson – each card should have a letter and a direction for where to go for the next card. Sample phrases the scavenger hunt can have students find are:

- A compass needle points north.
- The earth is a magnetic field.
- Magnets have two poles.
- Electricity can make a magnet.

You can stick the cards into the earth using sticks with the cards (pieces of paper) poked through the sticks. Each card might look something like this:



Procedure

Follow the steps in the table below to conduct the activity. **Sentences in bold are suggestions for what teachers might say to students.** *Items in italics are possible teacher answers to questions.*

Phase	Step	Action
Engage	1	<p><u>Ten Minute Exercise</u>: Introduction to concept maps/outdoor learning.</p> <p>If students are unfamiliar with concept maps and/or using the schoolyard as a classroom, begin by creating a concept map together as a class to go over rules and expectations for learning outside.</p> <p>As you go through the concept map, think aloud for how you are choosing where to draw your bubbles to connect different concepts on the map. For instance,</p> <p>“I am going to write the idea first and then put a bubble around it to make sure my bubble isn’t too big or too small for my information.”</p> <p>Or</p> <p>“I am going to connect this idea to that one instead of the main topic since they are related.”</p> <p>Or</p> <p>“That’s a good idea! Where would you connect that idea on our concept map?”</p> <p>Have in mind some expectations for outdoor learning specific to your schoolyard that you want to be sure students include. For instance,</p> <ul style="list-style-type: none">• <i>Regular school rules still apply (respect each other, listen to the speaker, follow directions, etc.)</i>• <i>No yelling, screaming, tapping on/waving into windows that will disrupt class learning inside the school building.</i>• <i>“Look, learn, and let go” when you see insects.</i>

		<p><u>Ten-Minute Review</u></p> <p>In groups, have students set up a concept map whose center circle reads, “Magnets and Compasses.”</p> <p>2 “On your concept map, add information that you already know about magnets and compasses. Also, add any questions you may have about the topic.”</p> <p>Go around the room and check group understandings of the topic and how to use a concept map.</p>
Explore	3	<p><u>Directions</u> (5 minutes)</p> <p>Give students directions for what to do outside. They should work in small groups, pairs, or individually.</p> <p>“When outside, you will be completing a scavenger hunt using a compass. Each station will give you a letter and a direction of where to go next. Write down the letter and then proceed to the next station. At the end, you should have spelled out a phrase. You may work as a group, partners, or individually.”</p>
	4	<p><u>20-Minute Scavenger Hunt</u></p> <p>Bring students outside. Keep track of the time, giving students ample warning for when it’s time to finish. Help students as needed to complete the scavenger hunt.</p>
Explain	5	<p><u>Compasses</u> (20 minutes)</p> <p>Once students have finished, begin teaching them how to make a compass using some natural items. Assist groups as necessary.</p>
Evaluate	6	<p><u>Warp-Up</u> (5 minutes)</p> <p>Using a new color of marker, have students add any new understanding they now have about compasses and magnets to their concept maps.</p>

Elaborate	7	<p>For homework, students can read in their textbook or continue reflecting on compasses and magnets to come up with additional ideas and/or questions to add to the concept maps. Perhaps students can study electromagnets to make this connection on their concept maps to magnets and compasses.</p> <p>Post the concept maps in the classroom. Throughout the unit, have a third (and fourth, fifth, etc. if you choose) color available for students to continue adding to their concept maps as they learn new lessons and things related to interactions between living things.</p>

Vocabulary

Understanding of the following terms is required in this activity.

Term	Definition
Compass	a device for determining directions by means of a magnetic needle pointing to the magnetic north
Magnet	a piece of some material (as the mineral iron oxide) that is able to attract iron;

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