



# EARTH ATTRACTIONS

## 4-H Electrical Science Lesson

### BUILD AND TEST A COMPASS



#### Project Skills:

Understanding earth's magnetic poles

#### Life Skills:

Problem solving — acquiring and evaluating information, predicting outcomes and analyzing data.

WI Academic Standards:  
Science C.4. Science Inquiry

#### Time:

30-35 minutes

#### Supplies:

- 1 compass (for the instructor)
- Access to a small amount of water
- Each pair of youth needs the following materials:
  - 1 big sewing needle
  - 1 magnet
  - 1 plastic bowl
  - A Simple Compass Worksheet
  - You Are Here Map
  - 1" square or circular piece of thin Styrofoam
  - 2 pencils

#### Getting Ready:

Make enough copies of the A Simple Compass Worksheet and the You Are Here Map.



Adapted from 4-H Electric Excitement, Electric 1 (4HCCS BU-06848), and Activity 11, pp. 26-27.

## WHAT TO DO

### *Describe the situation.*

1. Have the youth pair up. Give each pair the survival materials listed above.
2. Tell youth to imagine that they are out in the wilderness and it is getting dark. All they have with them are the supplies provided. Their task is to use the materials supplied to build a simple compass to determine which way to walk to reach the town.

### *Build a simple compass.*

1. Tell youth that next they will need a compass to determine which way is north. They can then use the map to determine which direction to walk to reach the town.
2. Ask them to complete the A Simple Compass worksheet to get ideas for building a compass.
3. Give them several minutes to complete the worksheet.
4. Review the worksheet line by line, asking youth for the correct answers to each question.
5. Make certain everyone knows how to build their own compass. Work with any youth that are having difficulties.
6. Ask each pair of youth to draw the flashlight they made showing the metal pointer and the free floating system.

### *Determine which way to walk.*

1. Have each team use their compass to determine which way is north. Ask them to point north. Use your compass to make certain everyone is pointing the correct way.
2. Have youth locate the You are Here location on the map. Inform them that is where they are on the map.
3. Tell them to align the map so that the north arrow on the map points the same direction as their compass points.
4. Ask them to point which direction they would walk to reach the town. Make certain that everyone is pointing the correct way.
5. Congratulate the youth for being able to find their way out of the wilderness.

## TALK IT OVER

Try to get each youth to express his or her feelings and experiences.

### Reflect:

- What types of materials will a magnet attract?
- How can you find the north pole of a magnet?
- What was difficult about making your compass?

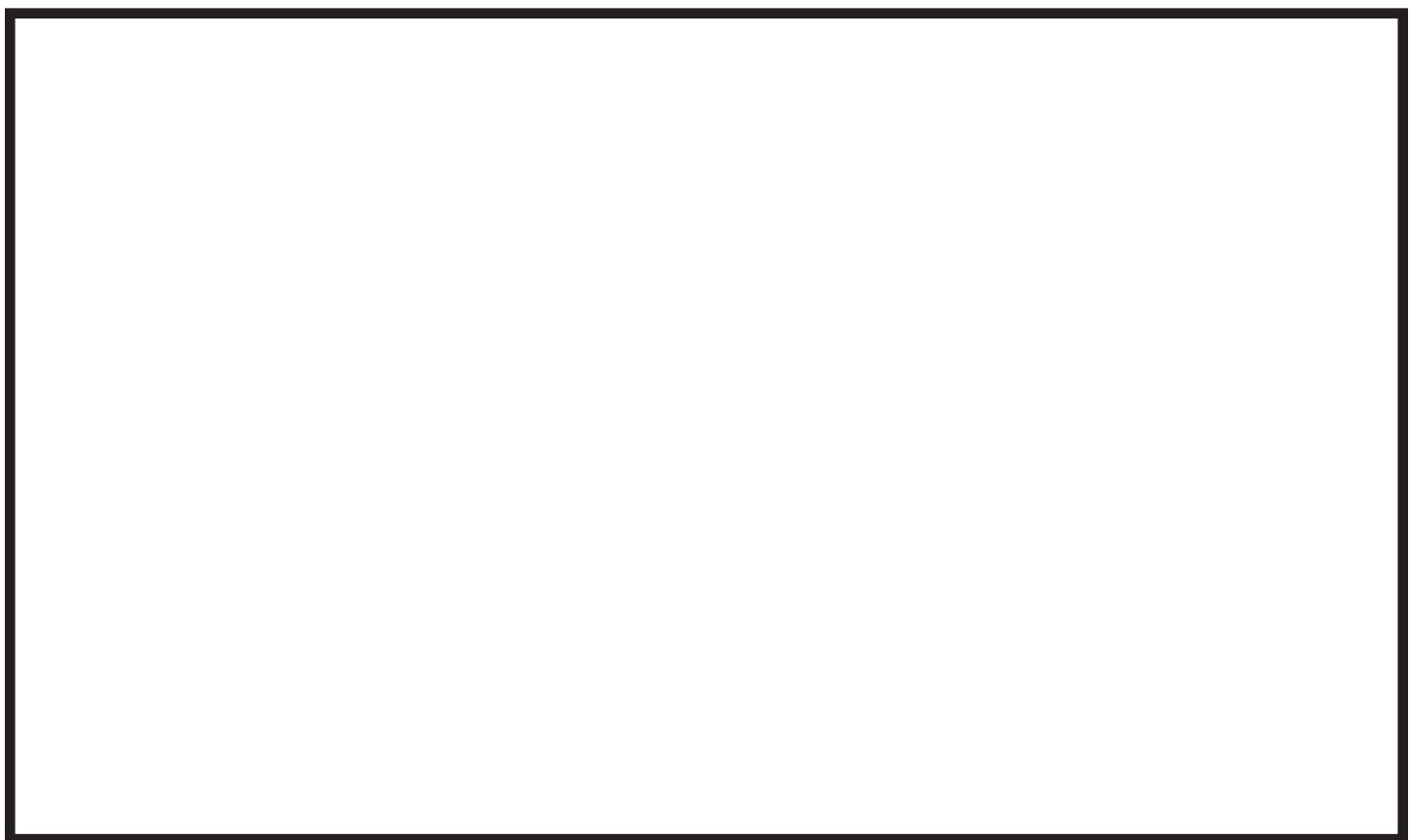
### Apply:

- How is the compass you made different from what you would buy in a store?
- Why is it better to learn something yourself by trying it, rather than to find the answer in a book?

# A Simple Compass Worksheet

EARTH ATTRACTIONS

- A. A compass uses a magnetized metal pointer that can rotate easily to point (be attracted) to the north. There are several key components necessary to build your compass.
1. Magnetic source – What do you have that is magnetic?
  2. Metal pointer – What piece of metal do you have that can be used to point?
  3. Free floating system to allow the pointer to move freely – What do you have that can be used to allow the pointer to rotate easily?
- B. A magnetic source can transmit its magnetism to another metal object if rubbed together. Try rubbing a magnetic source with a metal pointer until you succeed at making it magnetic.
- Rub the metal pointer with only one end of the magnetic source.
  - Rub in only one direction, not back and forth.
  - Rub together for approximately 20 strokes.
- C. The magnetic metal pointer needs to rotate easily in order to point north. Use your remaining materials to construct a free floating system that you can put the magnetic metal pointer on to allow it to rotate easily. Hint: What do you have that will float?
- D. Draw your compass in the space below.



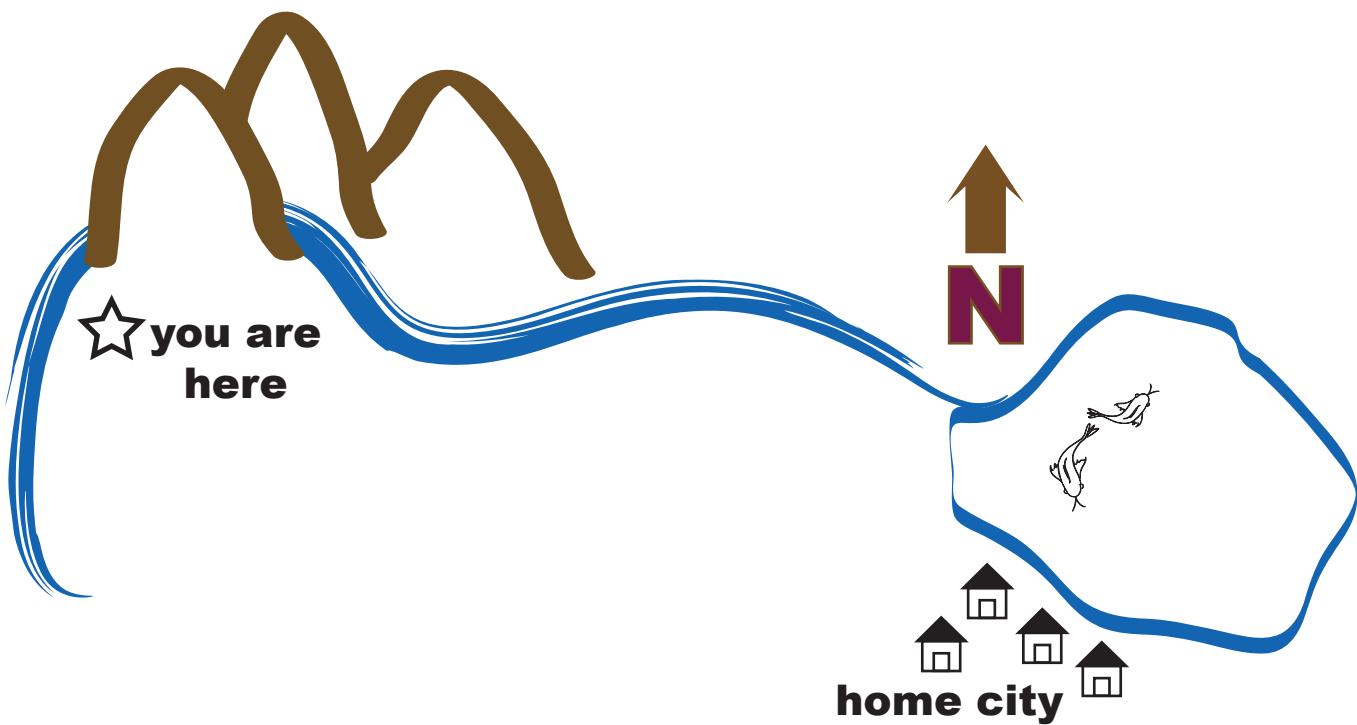
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# YOU ARE HERE MAP



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