Teacher Prep

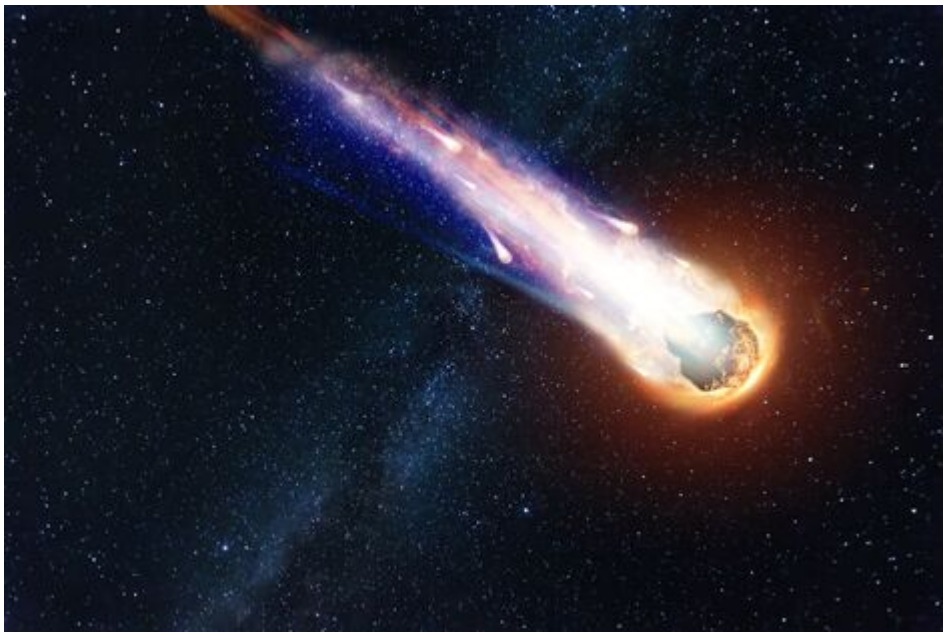
- Students will be testing magnets at 3 different temperatures. Each group will need 3 magnets, each at a different temperature.

- Approximately 1 hour before doing this activity, place enough magnets for each group in the refrigerator. For example, if you have 4 groups, place 4 magnets in the refrigerator.

- Approximately 1 hour before doing this activity, place enough magnets for each group in the freezer. For example, if you have 4 groups, place 4 magnets in the freezer.

Meteorites

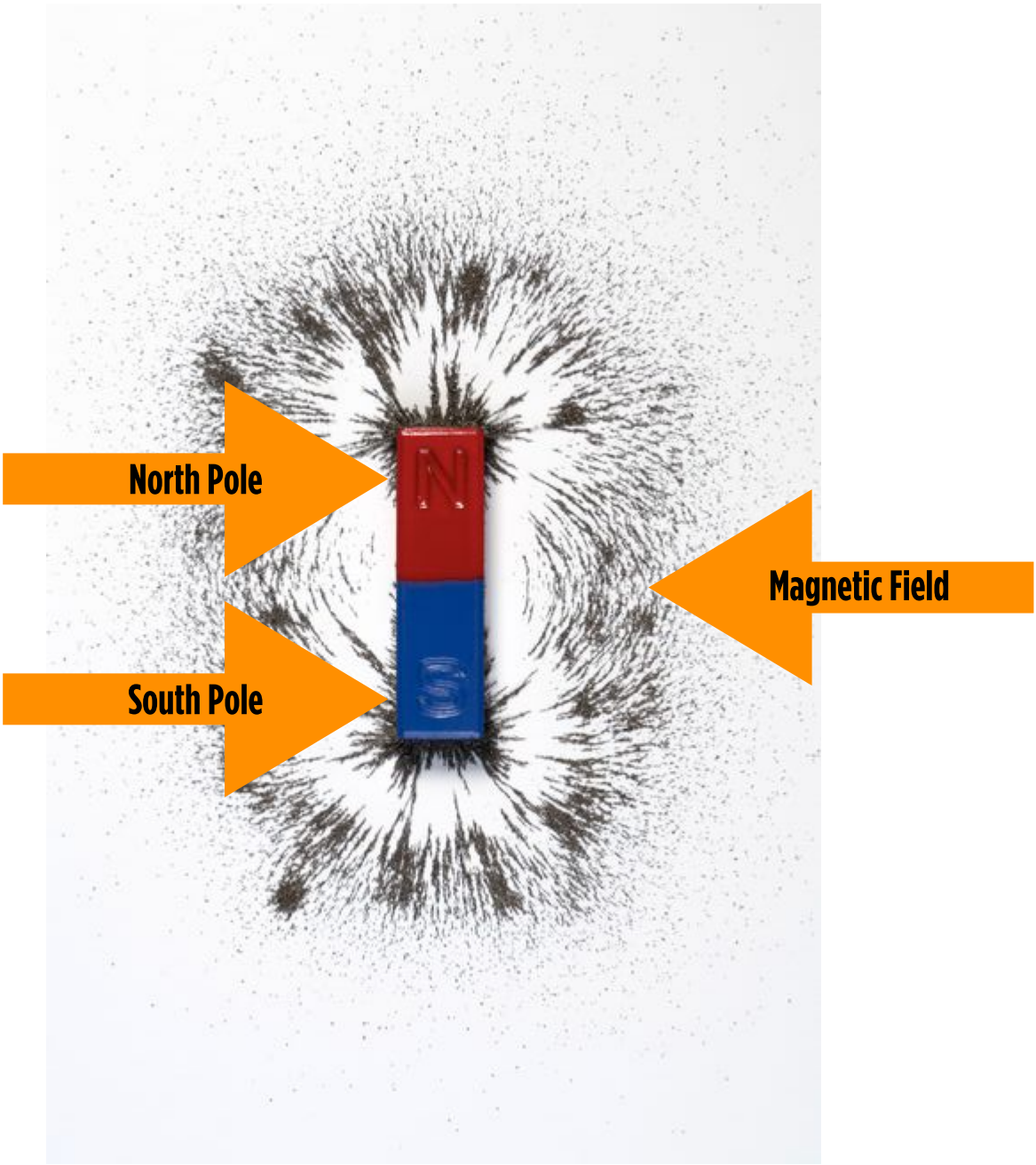
A meteorite is any solid material that comes from space, survives passing through Earth's atmosphere and lands on Earth.



This is an example of a meteorite found on Earth's surface.

Magnets

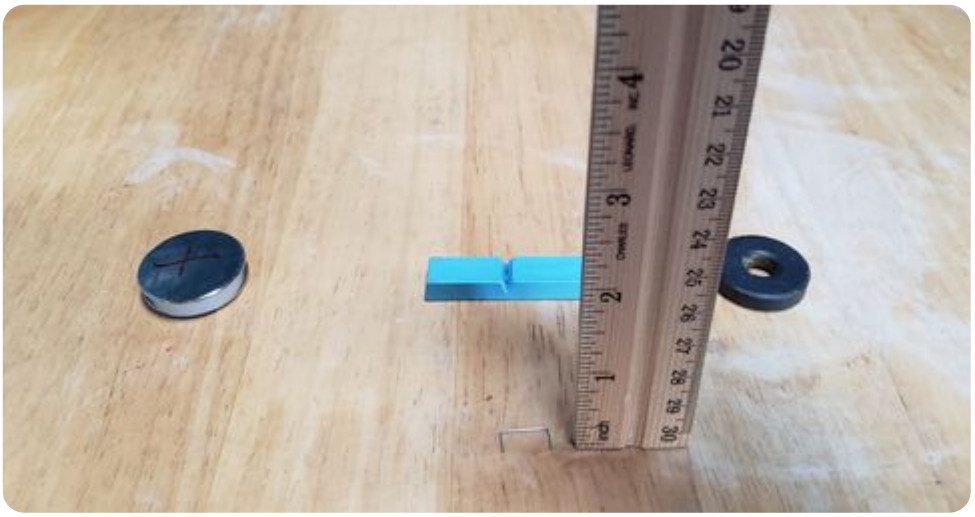
- Magnets have two poles, North and South.
- The power of a magnet extends out past the actual magnet. This is why when you get a magnet close to a metal object, you can feel the magnet and the object pull towards each other. This area outside of the magnet is called the magnetic field.



Testing Magnets

Follow the steps below to test the magnets given to you by your teacher. Your goal is to figure out whether magnets are still effective at colder temperatures! This way, Antarctic explorers will know if they can use magnets to extract meteorites!

- Hold the ruler upright next to the staple on table.



- To keep the temperature of your skin from affecting your results, wear a pair of garden or winter gloves while doing all testing.

- Your first magnet test will be performed at room temperature (about 70 degrees F).
- To do this:
  - Take one of your magnets and hold it alongside the ruler.
  - The magnet should be about 4 inches above the staple.
  - Very slowly lower the magnet until the staple is pulled to the magnet.
  - Use the ruler to measure the spot where your magnet attracted the staple.
  - Write down the distance at which the staple is pulled to the magnet in the data table.
  - Repeat this process at least 5 times.
  - Write each measurement in the data table.
  - Calculate the average distance for the magnet at room temperature in the data table.

Testing Magnets

- Obtain a refrigerated magnet from your teacher. These magnets have been placed in the refrigerator for about an hour. Follow the same steps as above for your refrigerated magnet.
- Make sure to write down all of your measurements in the data table.
- Obtain a frozen magnet from your teacher. These magnets have been placed in the freezer for about an hour. Follow the same steps as above for your frozen magnet.
- Look at your results for each magnet and answer these questions:

1. Which temperature of magnet was able to pick up the metal?

2. Based on your results, should Antarctic explorers use magnets when working in freezing conditions? What are the advantages or disadvantages of using a magnet in the Antarctic versus in a (room temperature) lab setting?

Data Table

	Distance		
	Room Temperature	Fridge: _____ degrees	Freezer: _____ degrees
Trial 1			
Trial 2			
Trial 3			
Trial 4			
Trial 5			

Building a Device

It's time to create a prototype for a device that can help Antarctic explorers extract meteorites!

Your device must meet the following requirements:

- Must have a method for tunneling into the ice and ground.
- Must have a magnet to attract the meteorite.
- Must have a rope or basket to attach to the meteorite to help pull it out of the ground.

Use the space below to plan your prototype:

Gather building materials and build your prototype!