Ari's Solar System Adventure

Name:_____

Date:_____

Vocabulary

Compass - a tool used to show the current directions based on Earth's magnetic field
Magnetic field - an invisible area that surrounds a magnet where a force can be detected causing attraction or repulsion to other magnetic material.
Magnet - material made up of atoms lined up in a way that creates a magnetic field and has an effect on other magnetic materials.

Introduction

What is a magnetic field?

1 Use a magnet to observe how magnetic material interacts with other materials in your space. Find items within your space that are similar to the items in the image below to test your magnet. Write down your observations. How is a magnet different from other materials?

My observations:

2 Based on your observations, come up with a question you have about magnets and/or magnetic fields.

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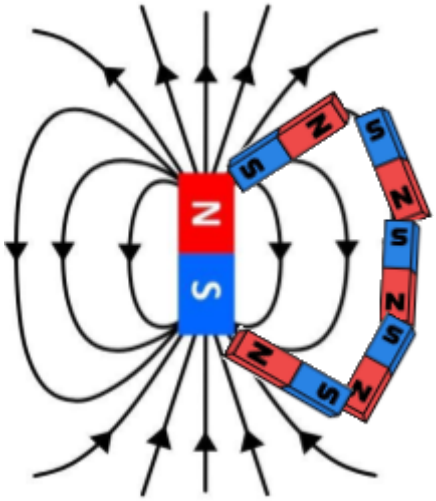
Activity 1

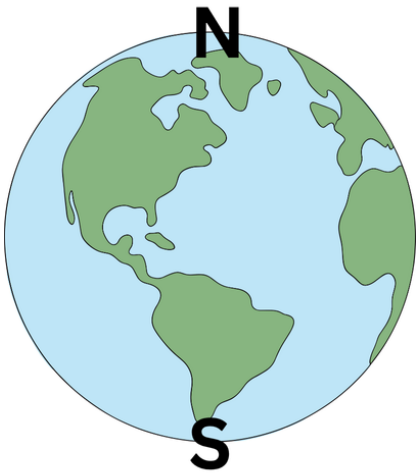
Ari's Compass

Scientists use arrows to show the direction of the magnetic interaction with the tail of the arrow as south and the head of the arrow as north.

1 Magnets have an invisible field that affects the materials that surround them. This image shows what these field lines would look like if we were able to see them. Notice that the "opposites attract" and the tail (south) end of the field line is attached to the north end of the magnet.



The Earth itself acts as one large magnet, which helps Ari orient itself. Compasses work by detecting the Earth's field lines, so Ari's compass will point in the direction of the field lines. Draw Earth's magnetic field lines below. These are the field lines that Ari orients to.



2 Set Ari to the Earth's north. Move Ari around and notice how the compass moves, continuously realigning North and South the same way. How do you think Earth's magnetic field affects Ari?

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Activity 2

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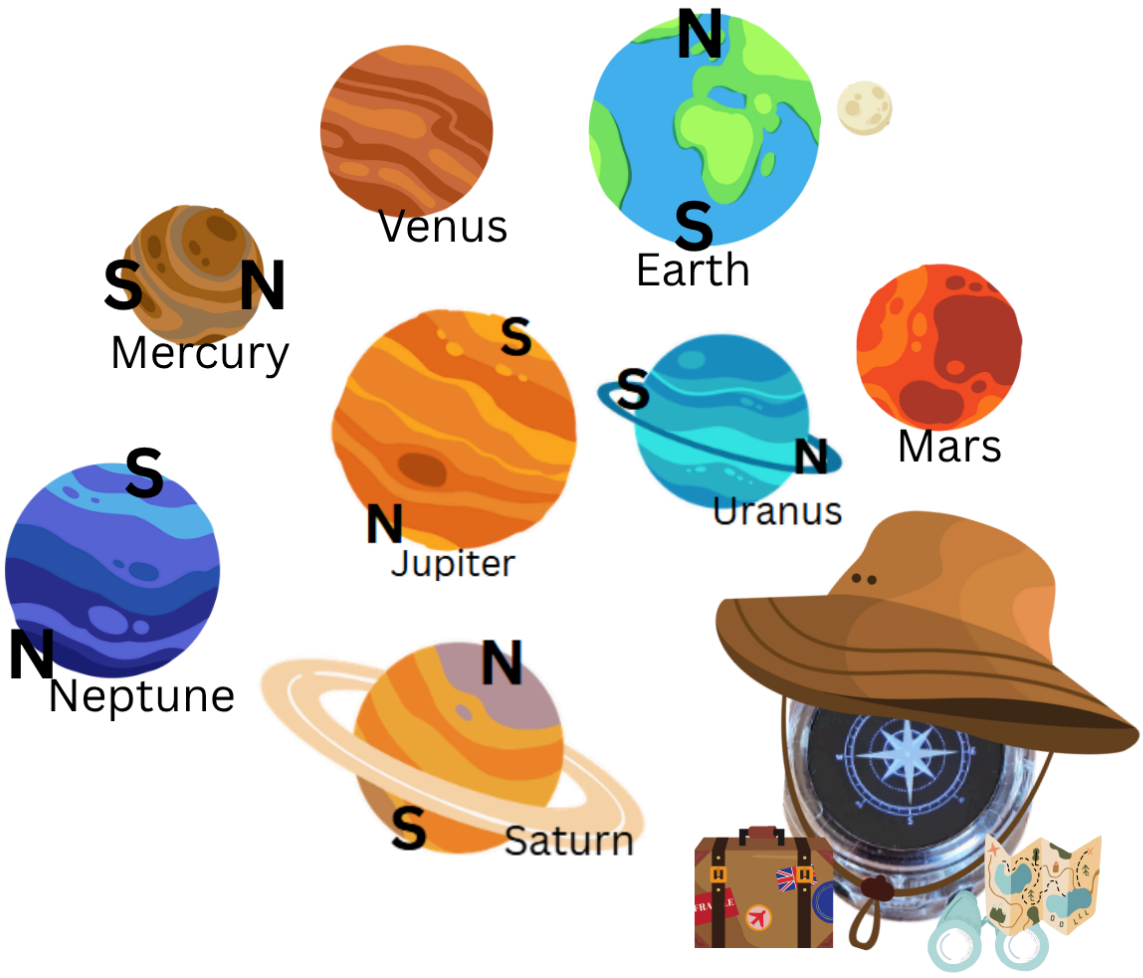
Ari is planning a grand adventure around our solar system. They have received word of exactly what item to pack with them for each planet. The problem is, planets throughout the solar system do not all have the same magnetic field orientation. Use the clues to help Ari find the items needed for their visit to each planet.



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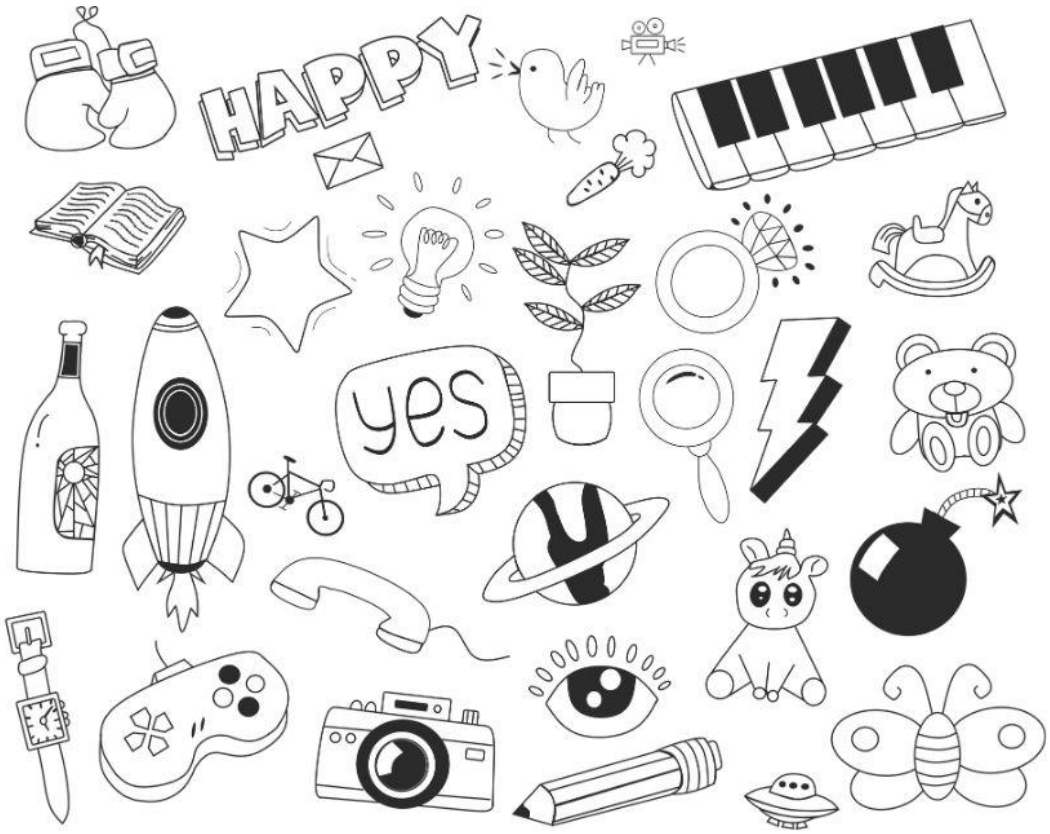
The clues are given in the compass orientation of each planet. Make sure you reset North using each planet's magnetic orientation before you figure out each clue. Venus and Mars orient based on Earth's compass because they do not have their own magnetic field.

Planet	Clue	What is the item?
Mercury	The object is North of the carrot.	
Venus	The object is Southwest of the rocking horse.	
Earth	Two objects South of the planet.	
Mars	Three objects North of the pencil.	
Jupiter	The object is South of the rocket.	
Saturn	The object is West of the telephone.	
Uranus	The object is Southeast of the piano.	
Neptune	The object is West of the unicorn.	



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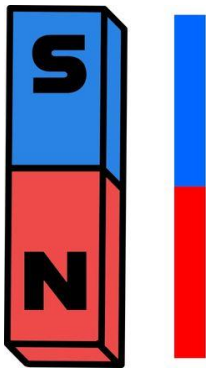
Exit Ticket



1. If you were to take the magnet below to each planet in our solar system, how would the magnet orient itself once you were there? Use blue and red colors to draw your magnet on each of the planets from Activity 2.

2. Explain why your magnets would orient the way you drew them.

Criteria for Success:

- Use the red and blue red and blue Color Code markers to indicate the orientation of the bar magnet on each planet with an identified magnetic field.
- Justify the orientation of the field drawing on what you learned in the lesson.