

8th Science: Amplify

Unit 2 Lesson 1.6

Analyzing Field Line Data

Mr. Sumner
Oct 15, 2019

Do Now

5:00

- Expectations, **ALL SILENT (VL = 0)**
 - Get packet from green bin
 - Go to assigned seat and put backpack on hook
 - Work on questions at top of paper

Do Now

Which way do the north and south poles of magnets face when they attract/repel?

What do the magnetic fields look like when magnets attract/repel?

Turn and Talk



- Share:

Do Now

Which way do the north and south poles of magnets face when they attract/repel?

What do the magnetic fields look like when magnets attract/repel?

- Expectations

- ***Turn your shoulders to partner***
- Make eye contact
- Stay on topic!
- Longer first name goes first (go to last if tie)

*****Cold calling 2+ for share out after*****

Today's Objectives

- I can prove whether claim #1 was correct or incorrect based on the evidence gathered from the SIM.

Today's Schedule

1. Modeling Field Lines
2. Predictions
3. Testing on SIM
4. CER

Modeling Magnetic Fields



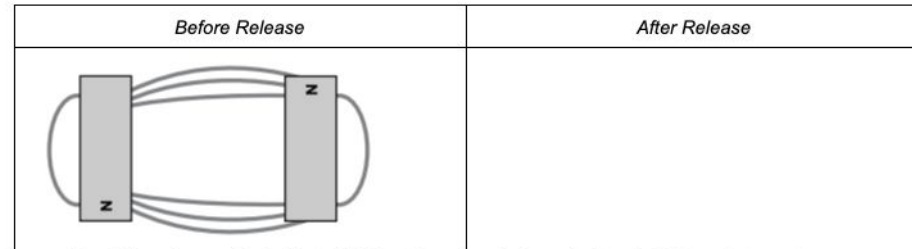
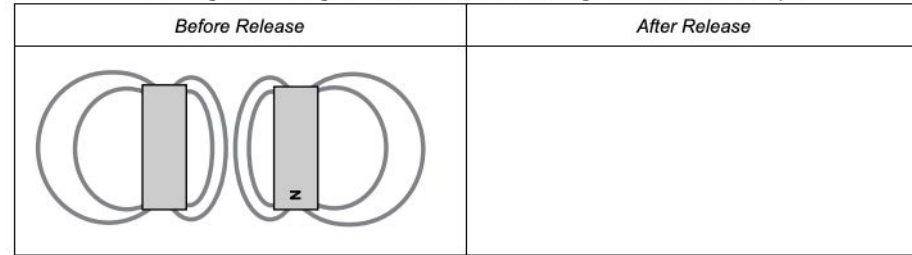
WHAT TO DO

- VL = 1.5
- Table Partner
- On Before: write N (north) and S (south) on correct end based on lines
- On After: Draw magnets with N and S, field lines, arrow showing motion
- Justify how you picked N/S for each pair of magnets

Modeling Magnetic Fields

Instructions: Draw what would happen after these two pairs of magnets were released.

- **MUST INCLUDE:** arrows showing direction of motion in "After" section, north/south label for missing sides of magnets, field lines around the magnets, label attract or repel



How did you know which side to label north and south for each drawing? **Complete sentences**

Modeling Magnetic Fields: Share Out

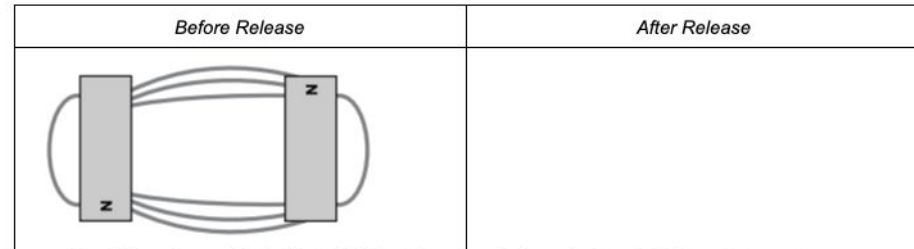
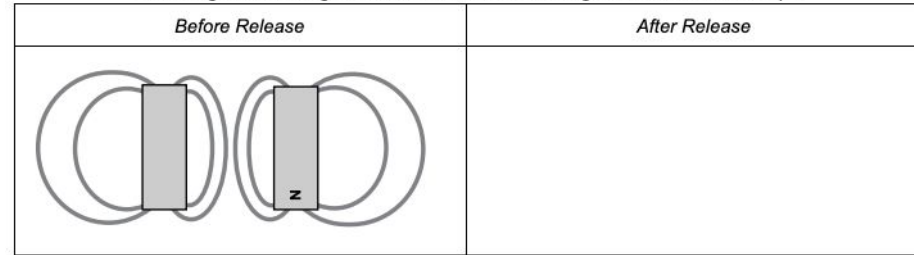
WHAT TO DO

- For top drawing: where did you place the N and S for rest of magnets? Why?
- For bottom drawing: Where did you place the N and S for rest of magnets? Why?

Modeling Magnetic Fields

Instructions: Draw what would happen after these two pairs of magnets were released.

- **MUST INCLUDE:** arrows showing direction of motion in "After" section, north/south label for missing sides of magnets, field lines around the magnets, label attract or repel



How did you know which side to label north and south for each drawing? **Complete sentences**

Revisiting Our Problem

WHAT TO DO

- VL = 0
- Eyes on screen
- Write down the following



Video: Troubleshooting a Magnetic Launcher

Write down the 3 ideas the scientists had for what went wrong

- _____
- _____
- _____

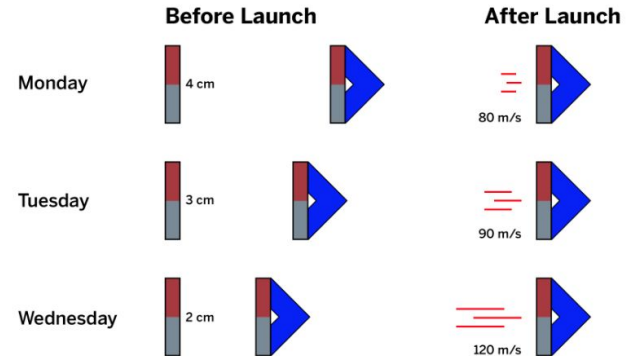
Revisiting Our Problem

Why did the spacecraft go so much faster than expected on Wednesday?

Claim 1: The magnets were misaligned on Tuesday.

Claim 2: Much more energy was in the launcher system on Wednesday than on Tuesday.

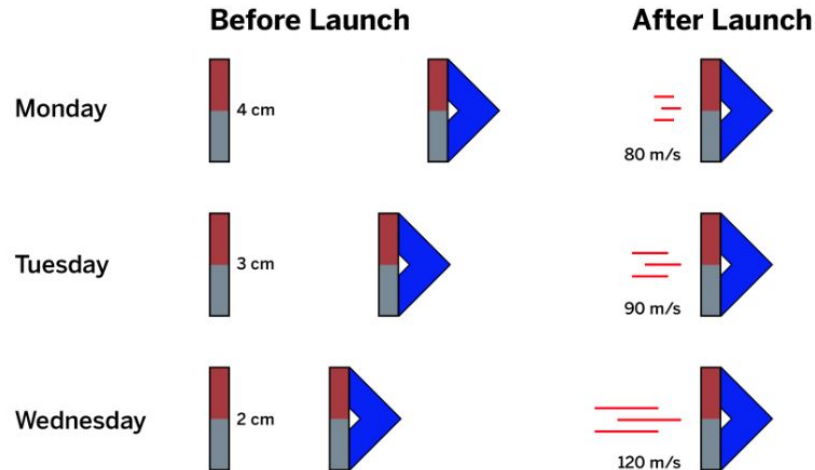
Claim 3: The magnetic force was much stronger on Wednesday than on Tuesday.



Revisiting Our Problem

Why did the spacecraft go so much faster than expected on Wednesday?

Claim 1: The magnets were misaligned on Tuesday.



Predictions for Claim #1

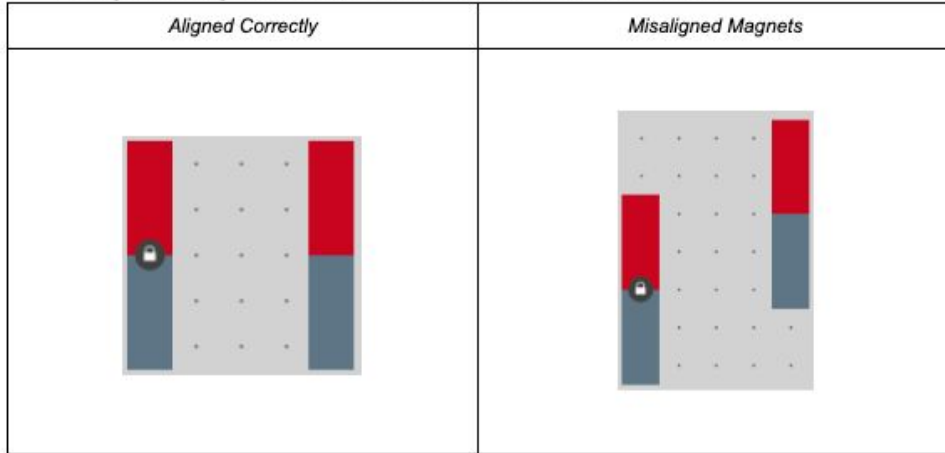


WHAT TO DO

- VL = 1.5
- Table partner
- For both drawings: draw what you think field lines will look like, north (N) and south (S) labels
- On questions: what will the speed and direction of the magnet on the right be when released?
- THE MAGNET ON THE LEFT WILL BE LOCKED IN PLACE

Predictions for Claim #1: Misaligned Magnets

Instructions: Draw what you think the field lines would look like for magnets that were misaligned and aligned. **MUST INCLUDE:** Field lines, north and south labels



What do you think the velocity (speed and direction) of the magnet on the right will be if they are aligned correctly and why? **Complete sentences**

What do you think the velocity (speed and direction) of the magnets on the right will be if they are misaligned and why? **Complete sentences**

Claim #1 Prediction



WHAT TO DO

- VL = 0
- Independent
- Tell me if you think this claim is right or wrong and why

Why did the spacecraft go so much faster than expected on Wednesday?

Claim 1: The magnets were misaligned on Tuesday.

Claim #1 Prediction

Do you think claim #1 is correct or incorrect and why?

Computer Setup

WHAT TO DO

- VL = 1.5
- Login to computer as soon as handed out
- Go to mistersumner.weebly.com
- Click on 1st link for SIM
- Start working if time left
- Done in 3 min



SIM: Testing Predictions

7:00

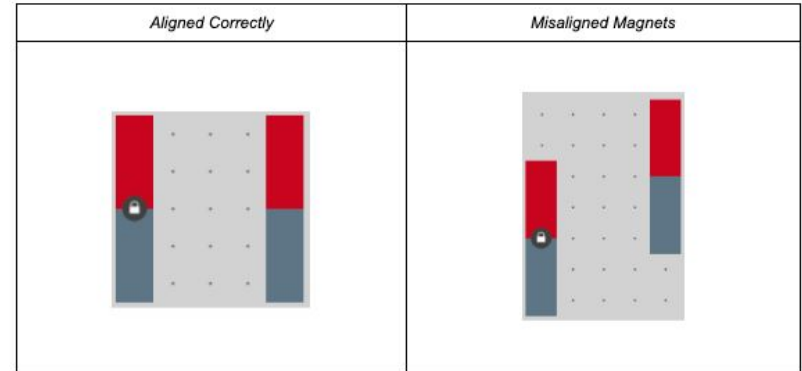
WHAT TO DO

- VL = 1.5
- Table partner
- Demo how to lock magnet
 - Use strong ones!
- For both drawings: draw field lines BEFORE RUN, north (N) and south (S) labels, arrows showing the motion AFTER RUN
- Describe velocity in 2 questions
- LOCK MAGNET ON THE LEFT
- Checking 1st drawing in 2 min
 - 2nd in 4 min, questions in 6 min

Testing Predictions

Instructions: Test the two alignments below to see if your predictions were right or wrong. Set up **EXACTLY** like in the picture. Click and draw lock button (bottom right of "Build" section) onto the left magnet.

- **MUST INCLUDE:** field lines BEFORE RUN, north and south label, arrows showing the direction of the motion after "Run"



What was the velocity (speed and direction) of the magnet on the right when they were aligned?

Complete sentences

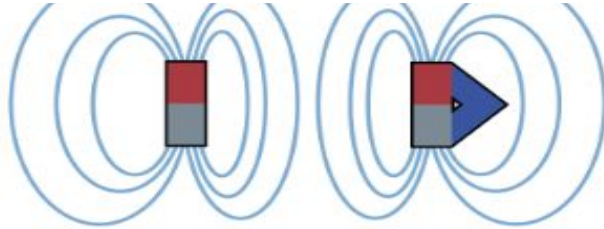
What was the velocity (speed and direction) of the magnet on the right when they were misaligned? **Complete sentences**

SIM: Testing Predictions

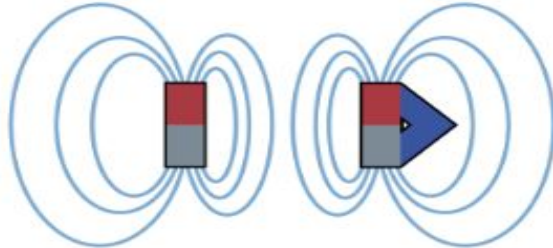


Claim 1: The magnets were misaligned on Tuesday.

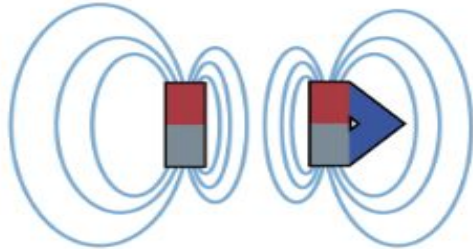
Monday



Tuesday



Wednesday



Testing Predictions

Instructions: Test the two alignments below to see if your predictions were right or wrong. Set up EXACTLY like in the picture. Click and draw lock button (bottom right of "Build" section) onto the left magnet.

- **MUST INCLUDE:** field lines BEFORE RUN, north and south label, arrows showing the direction of the motion after "Run"

Aligned Correctly	Misaligned Magnets

What was the velocity (speed and direction) of the magnet on the right when they were aligned?

Complete sentences

What was the velocity (speed and direction) of the magnet on the right when they were misaligned? Complete sentences

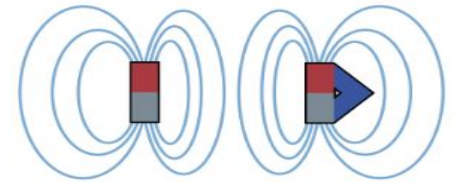
SIM: Testing Predictions

WHAT TO DO

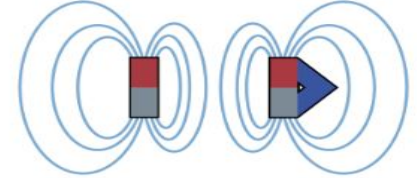


- VL = 1.5
- Table Partner
- Pictures to the right are the ACTUAL magnetic fields from the 3 tests
- Compare your drawings from the SIM to the ones on the board
- Based on this, do you think the magnets were aligned or misaligned
 - This is Claim #1

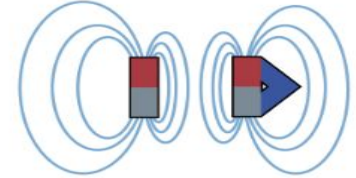
Monday



Tuesday



Wednesday



Comparing and Contrasting Field Lines

Compare the magnetic fields from the Tuesday picture to the ones you just testing in the SIM.

What is similar and what is different? **Complete sentences**

Do you think Claim #1 is correct or incorrect based on this comparison? **Complete sentences**

CER

WHAT TO DO



- VL = 0
- Independent
- Use the SIM drawings and questions above CER to help you
- Answer the question: Were the magnets aligned or misaligned on Tuesday?
- Checking claim in 1 min, evidence in 2 min, reasoning, in 4 min

CER

Were the magnets aligned or misaligned on Tuesday? Answer in **CER** format.

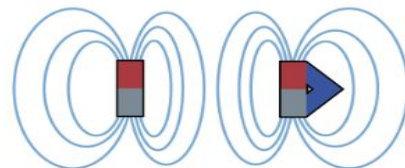
Claim: On Tuesday, the magnets were _____

Evidence: When comparing the magnetic fields from Tuesday to the SIM it shows _____

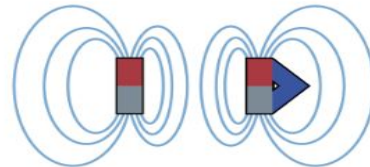
Reasoning: Since _____

this proves _____

Monday



Tuesday



Wednesday

