

# Weather and the Atmosphere

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Teacher:

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Class:

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**Earth and Space Science**  
**Unit 3**  
Lab Notebook

# Lesson 1: How Do Meteorologists Use Science to Predict the Weather?

**Directions:** Look up the real current weather forecast. Record your prediction for tomorrow's weather and explain your reasoning.

**Prediction:**

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**Explanation:**

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How do you think meteorologists are able to predict the weather? Include evidence and reasoning to support your response.

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**Lesson 1**

Record any questions you have about weather reports and maps.

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**Additional notes:**

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# Lesson 2: Weather vs. Climate

**Question:** What is the difference between climate and weather?

**Data:**

	Observations/Findings
Weather Maps	
Climate Map	



# Lesson 3:

## How Does Air Move?

**Question:** How does the air in our atmosphere move on its own?

**Procedure:**

1. Pour cold water into the bottle on the left. Fill it halfway so the water stops just below the connecting tube.
  
2. Pour hot water into the bottle on the right. Fill it halfway so the water stops just below the connecting tube.
  - Discuss with your group: Do you think the air over the cold water and the air over the hot water are the same temperature? Why?
  
3. Light one incense stick by holding it in the flame for 5 seconds.
  
4. Lift the incense stick. If there is a flame present, gently blow it out so you can see the orange tip glow. Insert the lit incense stick into the bottle on the right above the cold water. (Do not allow the incense stick to touch the water because it will burn out.) Instead, hold the stick still about 2 cm above the water. Observe the movement of the smoke from the incense stick.

**Data:** Record your observations in the space below:

Observations



# Lesson 4:

## What Goes Up Must Come Down

**Question:** How does the movement of water affect the weather?

**Directions:** After modeling the water cycle with your group, create a diagram of the water cycle and label it in the space below.





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**Lesson 4****Analysis Questions:**

1. During which part(s) of the water cycle is the water the warmest? How do you know? Where is the heat coming from?

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2. During which part(s) of the water cycle is the water the coldest? Where does the heat go?

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# Lesson 5: How Air Creates Our Climate

**Question:** Why do different parts of the world have different climates?

**Data:** Record your observations as you compare two different maps. Then, record the inferences you can make based on your observations.

Maps Compared	Observations	Inferences
<p style="text-align: center;"><b>Climate Map and Solar Radiation Map</b></p>		
<p style="text-align: center;"><b>Climate Map and Air Mass Map</b></p>		





# Lesson 6: Fronts, Day Two

**Directions:** As you review the provided information, record notes in the graphic organizer below.

Type of Front	Drawing	What is it?	What weather does it bring?
Cold Front			
Warm Front			
Occluded Front			
Stationary Front			

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**Lesson 6, Day Two**

**Additional notes:**

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# Lesson 7:

## Our Swirling Atmosphere

**Question:** Does Earth's rotation affect the weather?

**Procedure:**

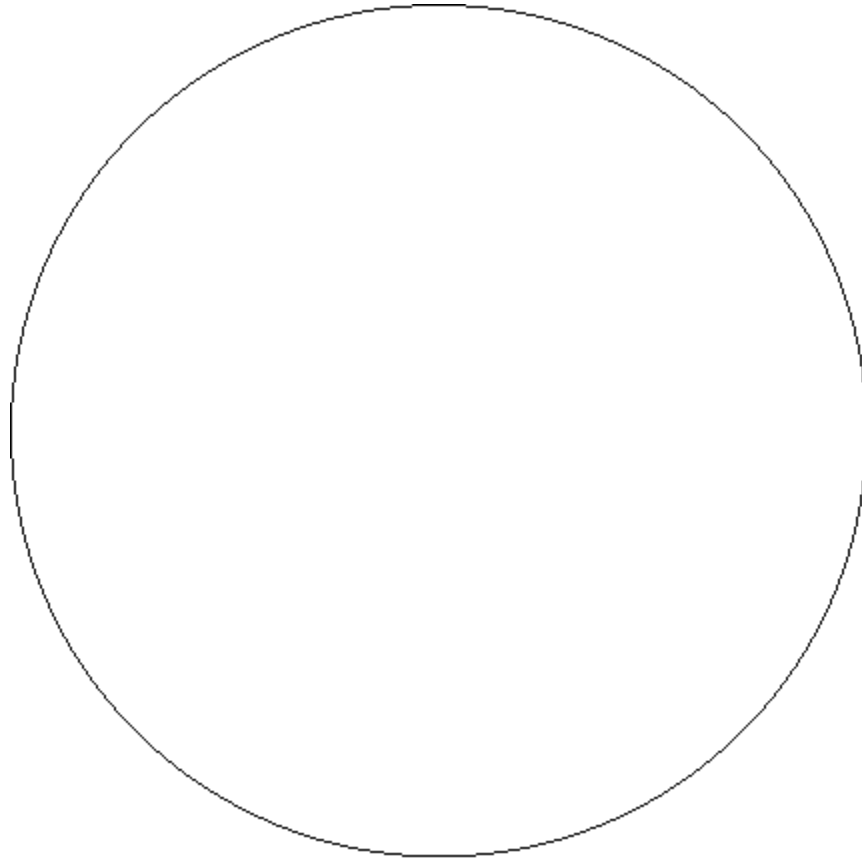
1. Working with a partner, place a globe on a steady, flat surface. Locate the equator, the north pole, and the south pole on the globe.
2. Have your partner rotate the globe in a counterclockwise direction at a slow, steady speed. As the globe rotates, use a marker to gently draw a line from the north pole to the equator. Sketch the line in circle A in your Lab Notebook. Mark the four compass directions and the equator in your diagram. When you are done, erase the line on the globe.
3. Next, rotate the globe counterclockwise while another group member uses the marker to draw a line from the equator to the north pole. Sketch this line in circle B in your Lab Notebook. Then add compass directions and the equator. When you are done, erase the line on the globe.
4. Next, rotate the globe counterclockwise while another group member uses the marker to draw a line from the south pole to the equator. Sketch this line in circle C in your Lab Notebook. Then add compass directions and the equator. When you are done, erase the line on the globe.
5. Next, rotate the globe counterclockwise while another group member uses the marker to draw a line from the equator to the south pole. Sketch this line in circle D in your Lab Notebook. Then add compass directions and the equator. When you are done, erase the line on the globe.

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**Lesson 7**

**Data:** Record your observations below.

**Circle A**

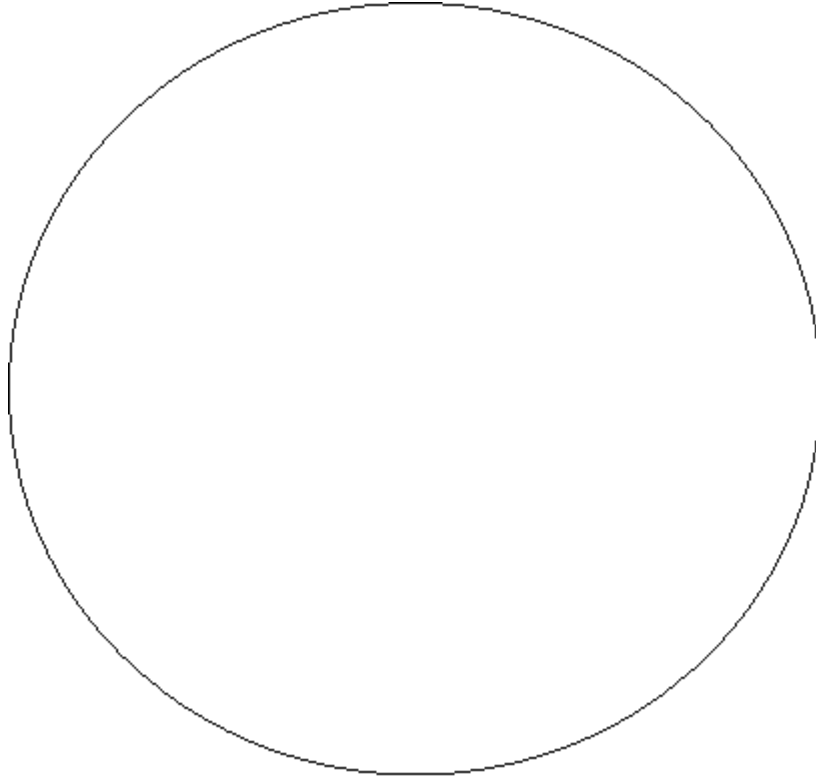




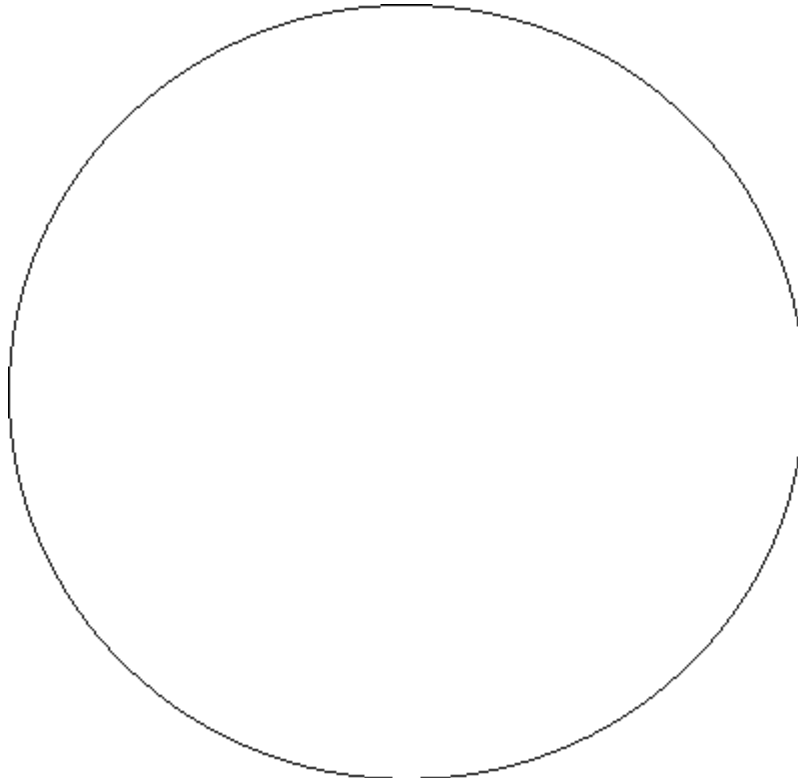
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**Lesson 7**

**Circle B**



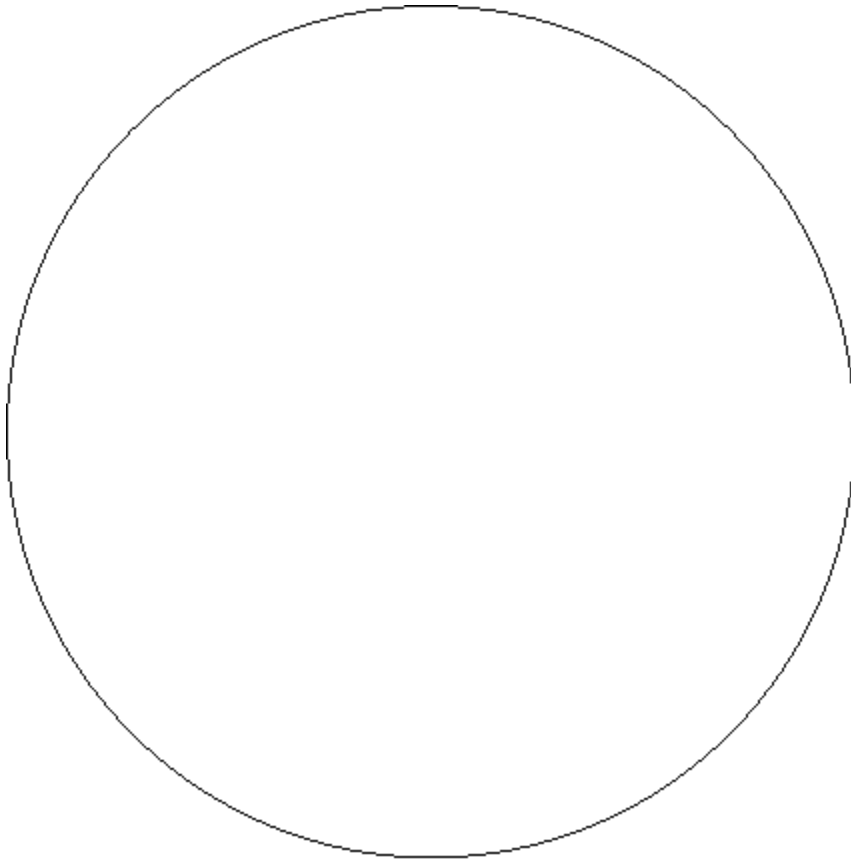
**Circle C**



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## Lesson 7

Circle D



### Discussion Questions Before Video:

1. What happened when you tried to draw a straight line on the globe as it rotated?
2. What patterns do you notice in the appearance of the lines?

### Discussion Questions After Video:

1. How was the ball toss different when the platform was moving? Why?
2. Was the ball actually curving midair? Why?
3. How might this connect to the movement of weather on Earth?



# Lesson 8: Storm Warning!

**Question:** What causes extreme weather events?

**Directions:** Take notes on the videos by writing and drawing in the space below.

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