

Name: \_\_\_\_\_

Period: \_\_\_\_\_

### Meteorology 3: Pressure and Wind

#### I. Wind

- \_\_\_\_\_ A. [Wind Vodcast](#)
- \_\_\_\_\_ B. [Water Tank Lab](#)
- \_\_\_\_\_ C. [Burning Splints Smoke Demo](#)
- \_\_\_\_\_ D. [15-3 Guided Reading](#)
- \_\_\_\_\_ E. [Winds Picture and Questions](#)
- \_\_\_\_\_ F. [Convection Current Demo](#)
- \_\_\_\_\_ G. [Wind Senteo Check](#) (not for grade)
- \_\_\_\_\_ H. [Land vs. Water Lab](#)
- \_\_\_\_\_ I. [Coastal Winds Vodcast](#)
- \_\_\_\_\_ J. [Coastal Winds Gizmo](#)
- \_\_\_\_\_ K. [Bill Nye - Wind](#)
- \_\_\_\_\_ L. [Winds Ediscio Flash Cards](#)
- \_\_\_\_\_ M. [Land/Sea Breezes Check with Senteo](#)
- \_\_\_\_\_ N. [Summary of Weather Foldable - Complete ¼ on wind](#)
- \_\_\_\_\_ O. [Wind Standard Check](#)

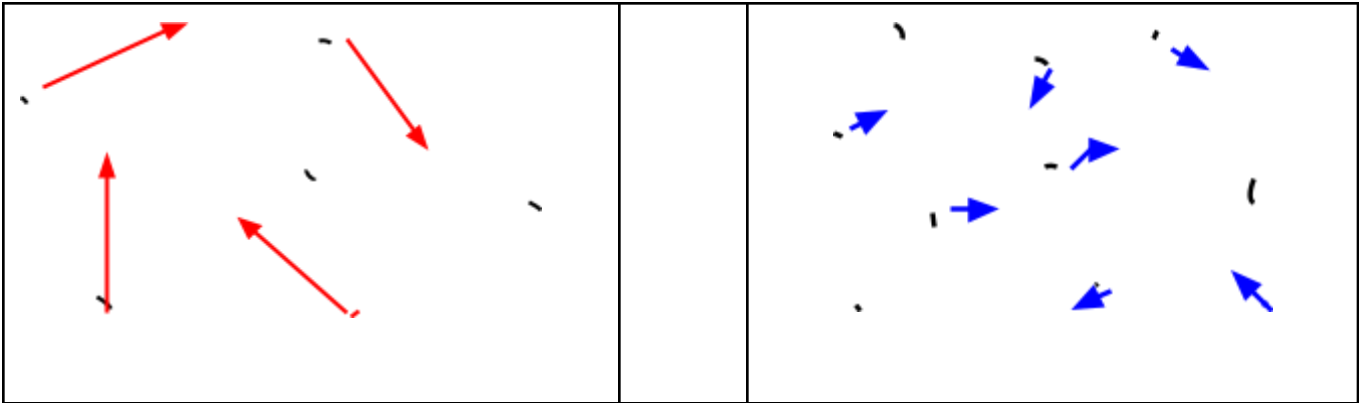
Percent Score \_\_\_\_\_

#### II. Pressure

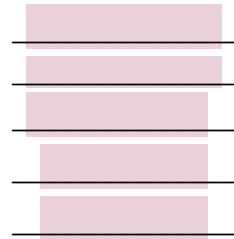
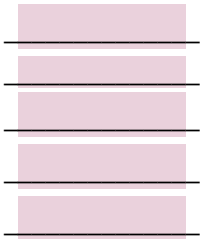
- \_\_\_\_\_ A. [Air Pressure In a Bottle lab](#)
- \_\_\_\_\_ B. [Boyle's and Charles' Laws Gizmo](#)
- \_\_\_\_\_ C. [Julius Sumner Miller Videos](#)
- \_\_\_\_\_ D. ["A Weighty Matter" story](#)
- \_\_\_\_\_ E. [Pressure Poem](#)
- \_\_\_\_\_ F. [Crushing Cans Demo](#) (with Sealer Handle and Water), Cup and Notecard and Blog Response
- \_\_\_\_\_ G. [Pressure \(High and Low\) Senteo Examples](#)
- \_\_\_\_\_ H. [Pressure Ediscio Flash Cards](#)
- \_\_\_\_\_ I. [Pressure Essays/Short Answers on Blog](#)
- \_\_\_\_\_ J. [Weather Foldable - complete ¼ on pressure](#)
- \_\_\_\_\_ K. [Pressure Standard Check](#)

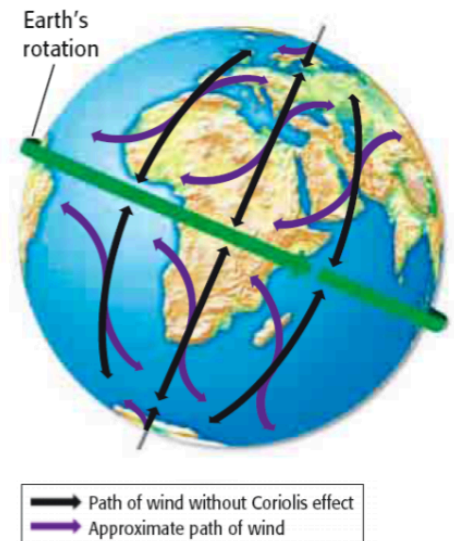
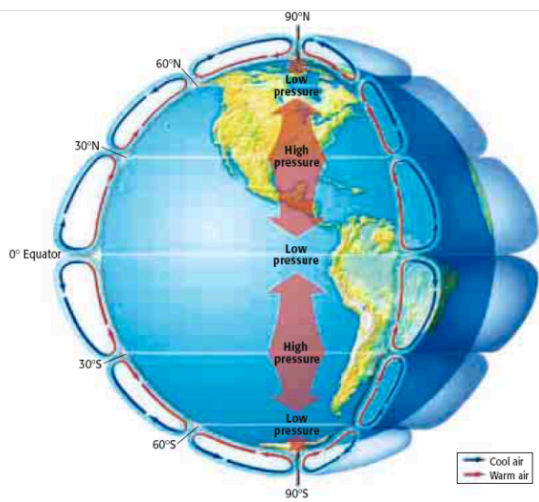
Percent Score \_\_\_\_\_

#### I-A. Wind [Vodcast](#)



Characteristics



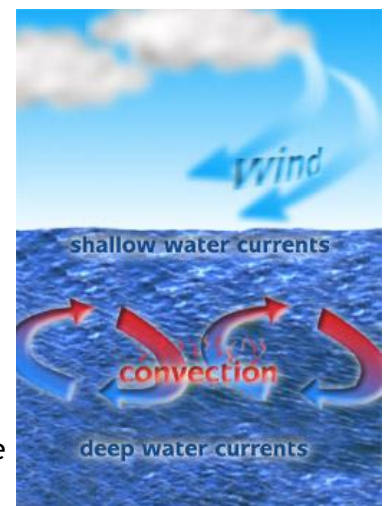


## I-B. Water Tank Lab

### Materials:

- |                                      |                        |
|--------------------------------------|------------------------|
| 1 Water Tank                         | 2 droppers             |
| 1 beaker, containing red food color  | Hot and cold tap water |
| 1 beaker, containing blue food color |                        |

1. Gather the materials listed above at your work table.
2. Add **250mL** cold water to the beaker containing blue food color.
3. Add **250mL** hot water to the beaker containing red food color.
4. Make sure that the divider in the middle of the water tank is pushed firmly to the bottom of the tank. For easier viewing, your teacher may direct you to tape a piece of unlined paper to the outside of one of the long sides of the water tank. This will be the back of the tank.
5. Have one student in your group pour **200 mL** of the hot water into one side of the tank **at the same time** that another student in your group pours **200 mL** of the cold water into the other side of the tank.
6. Wait a few seconds until the water in the tank stops moving. Have a group member slowly and carefully remove the divider. Watch the movement of the water in the tank.



Describe what happened when the divider between the hot water and the cold water was

pulled out. Why did this happen?

---

7. Use a clean dropper to carefully put 1-2 drops of hot red water from the beaker into the tank. Watch closely.

Explain what happened when hot water was dropped into the tank.

---

8. Use a clean dropper to carefully put 1-2 drops of cold blue water from the beaker into the tank. Watch closely.

Explain what happened when the cold water was dropped into the tank.

---

9. Disturbing the water as little as possible, have each member of your group, one at a time, slide a finger slowly down into the water.

Describe how your finger felt when you slid it down to the bottom of the tank.

---

10. Carefully put the divider back into the tank and, using the appropriate dropper, stir the water in **only one side** of the tank. Now, there is hot and cold water on one side and warm water on the other side.

Predict what will happen when the divider separating the layers of hot and cold water from the warm water is removed from the tank.

---

11. Slowly and carefully remove the divider from the tank. Was your prediction correct? If your prediction was not correct, describe what really happened.

---

12. From this activity, what can you conclude about the interactions of fluids of different densities?

---



### I-C. *Burning Splints Smoke Demo*

PREDICT: Before the demonstration, predict the way the smoke from the burning splint will move when held between the hot burner and the cold water.

\_\_\_\_\_

RESULTS: Describe what you observed from the experiment.

\_\_\_\_\_

CONCLUSION: Why does the smoke move the way you observed?

\_\_\_\_\_

### I-D. 15-3 Guided Reading

#### Section: Global Winds and Local Winds

#### WHY AIR MOVES

1. What causes differences in air pressure?
- a. even heating of the Earth    c. unequal heating of the Earth
  - b. even cooling of the Earth    d. increased heating of the Earth
2. The movement of air caused by differences in air pressure is called
- a. dense air.    c. polar air.
  - b. wind.    d. vents.
3. Air is warmer and less dense than surrounding air at the equator because the equator receives more
- a. wind.    c. solar energy
  - b. air pressure.    d. radiation
4. Because air at the poles is colder and denser than surrounding air, it
- a. rises.    c. circulates.
  - b. sinks.    d. stagnates.
5. High pressure areas are created around the poles as cold air
- a. rises.    c. stagnates.
  - b. blows.    d. sinks.
6. After high pressure areas are created around the poles, cold polar air flows toward
- a. the equator.    c. the South Pole.
  - b. the North Pole    d. the atmosphere.
7. Large circular patterns of air movement are called \_\_\_\_\_.
8. Bands of high pressure and low pressure found every 30 degrees of latitude are called \_\_\_\_\_.
9. When the paths of winds and ocean currents seem to curve because of the Earth's rotation, it's

called the \_\_\_\_\_.

## GLOBAL WINDS

Match the correct description with the correct term. Write the letter in the space provided.

10. winds that blow from 30 degrees latitude in both hemispheres almost to the equator a. polar easterlies
11. the area around the equator where trade winds meet b. westerlies
12. wind formed as cold, sinking air moves from the poles to 60 degrees north and 60 degrees south latitude c. trade winds
13. wind belts that extend between 30 degrees and 60 degrees latitude in both hemispheres d. doldrums
14. area in which sinking air creates high pressure and weak winds at about 30 degrees north and 30 degrees south latitude e. horse latitudes
15. Narrow belts of high speed winds in the upper troposphere and lower stratosphere are called \_\_\_\_\_.

## LOCAL WINDS

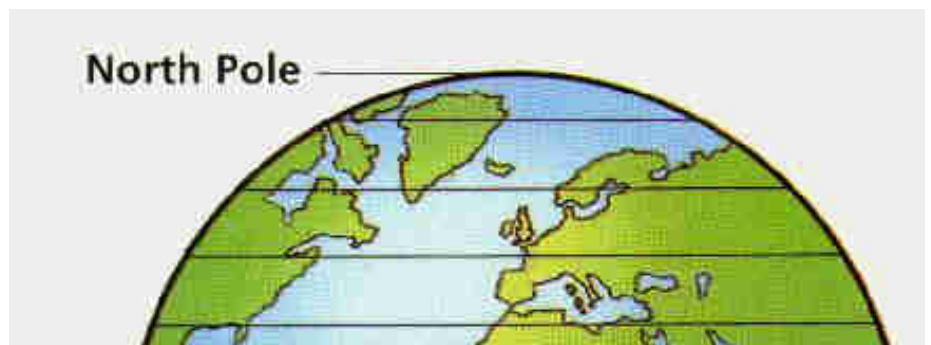
16. Which of the following are local winds?
- |                     |                |
|---------------------|----------------|
| a. mountain breezes | c. polar winds |
| b. convection cells | d. westerlies  |
17. Explain how geographic features can cause local winds.

\*When finished, correct your answers with an answer key.

\*\*\*[Download the "Webpage Screenshot" extension](#). Use the "Webpage Screenshot" extension from the Chrome Web Store to take a shot of the picture and questions below. Then you can crop it, add text, and draw on it like the questions ask you to. When it's done, "save the picture to your Chromebook. To put this picture in this packet, click on "Insert", "Image", and then upload the picture you just saved. Confused? Ask your teacher what to do.

## I-E. Winds Picture and Questions

Use Figure 2 (page 459) and Figure 4 (page 461) to complete the next part



of the assignment:

On the picture to the right, draw the following:

- 1) **Pressure belts** - Where are the areas of high and low pressure?
- 2) **Convection Cells** - Where are they located? Where is the hot and cold air?
- 3) **Coriolis Effect** - Use arrows to indicate where winds are deflected due to Earth's rotation.

### Enduring Understanding

Which has more density - warm air or cold air?

\_\_\_\_\_

Air moves from areas of \_\_\_\_\_ (high or low) pressure to areas of \_\_\_\_\_ (high or low) pressure.

Cold air has \_\_\_\_\_ (high or low) pressure. Warm air has \_\_\_\_\_ (high or low) pressure.

Wind is caused by differences in \_\_\_\_\_, which is caused by unequal \_\_\_\_\_.

Winds are named by the direction they are \_\_\_\_\_.

## I-F. Convection Current Demo

Problem: What happens when hot water is mixed with room temperature water?

*After watching this demo, answer the following questions:*

1. Can you see the hot water leaving the small beaker? \_\_\_\_\_
2. Which way does the hot water go? \_\_\_\_\_
3. Where does the hot water seem to gather? \_\_\_\_\_
4. How do you explain the results?

---

---

## I-G. Wind Senteo Check (not for grade)

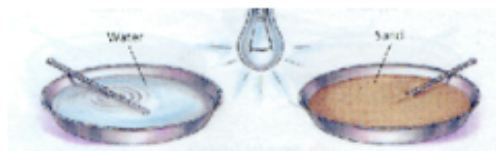
What was your score on this practice quiz? \_\_\_\_\_

Which questions did you answer incorrectly? \_\_\_\_\_

How did/can you master the concepts in this practice quiz?

---

## I-H. Land vs. Water Lab



**Purpose:** Determine whether water or sand changes temperature more easily. Connect today's observations to land and sea breezes.

**Materials and Procedures** 2 thermometers, 2 pans of equal size and shape, sand, water, ruler, 100 W lamp, ring stand (for lamp)

1. Fill one pie pan halfway with water, and fill another pie pan halfway with sand.
2. Place both pie pans an equal distance from the lamp.
3. Place a thermometer in each pan. The tip of each thermometer should be just under the surface of the water or the sand.
4. Predict which will heat and cool faster. Write your hypotheses on the top of the next page.
5. Turn on the lamp. Every minute for 13 minutes, record the surface temperature in each pie pan as it heats up. When checking, keep the thermometer tip in each substance.
6. Record your values in data Table 1 on the next page.



7. After 13 minutes, turn off the lamp and record the temperatures of both pie pans for 13 minutes every minute as it cools. These measurements should be recorded in Data table 2 on the next page.

**Hypothesis:** Do you think the sand or water will heat up faster? \_\_\_\_\_  
 Do you think the sand or water will cool off faster? \_\_\_\_\_

**DATA Table 1**  
**Heating of Water vs. Sand**

Time in minutes	Water Temp C'	Sand Temp C'
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		

**DATA Table 2**  
**Cooling of Water vs. Sand**

Time in minutes	Water Temp C'	Sand Temp C'
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		

1. What was the difference between the starting temperature of the water and the ending temperature of the water?  
 Heating- \_\_\_\_\_

- Heating-
- 



- 

- 

- \_\_\_\_\_

## I-I. Coastal Winds in Mexico [Vodcast](#)

There aren't any specific notes to write for this vodcast. Here's some space to write.

---

## I-J. Coastal Winds [Gizmo](#)

### Student Exploration: Coastal Winds and Clouds

**Vocabulary:** condensation, convection, convection current, land breeze, sea breeze



**Prior Knowledge Questions** (Do these BEFORE using the Gizmo.) A hot-air balloon contains a propane burner that directs hot air into the interior of the balloon. You can see the flames in the photo at left.


1. What happens when the air inside the balloon is heated? \_\_\_\_\_
2. What might happen if the burner was turned off? \_\_\_\_\_


### Gizmo Warm-up

Have you ever taken a walk along an ocean beach and noticed a refreshing breeze blowing in from the water? The cause of this breeze, called a **sea breeze**, is related to the reason that a hot-air balloon is able to fly high in the sky. The *Coastal Winds and*



*Clouds* Gizmo™ allows you to explore how daily temperature variations are related to sea breezes and other weather phenomena.



Click **Play** (  ), and watch the Gizmo for 24 simulated hours, focusing on the sailboat.

1. Click **Pause** (  ) when the sailboat starts moving towards the shore. This represents the start of the sea breeze. What time is it? \_\_\_\_\_
2. Click **Play**, and then click **Pause** when the sailboat starts moving out to sea again. This represents the start of the **land breeze**. What time is it now? \_\_\_\_\_
3. Click **Play**, and now observe the clouds for a day. What do you notice? \_\_\_\_\_

(continued on next page...)

<b>Activity A:</b>  <b>Temperature and wind</b>	<u>Get the Gizmo ready:</u> <ul style="list-style-type: none"><li>• Click <b>Reset</b> (  ).</li><li>• Turn on the <b>Weather probe</b>.</li></ul>	<b>Wind direction:</b>  <b>Speed: 8.6 mph</b>
---	---	--

**Question: How is wind speed and direction related to air temperature?**

1. Think about it: Imagine a pocket of air over the land ("land air"), and another pocket of air over the ocean ("ocean air").
  - A. Which air pocket would you expect to heat up more during the day? \_\_\_\_\_  
Why? \_\_\_\_\_
  - B. Which air pocket would you expect to cool down more at night? \_\_\_\_\_  
Why? \_\_\_\_\_

2. **Gather data:** Check that the time is 6:00 a.m. Drag the **Weather probe** so that it is on the ocean's surface (**Alt.** 0 ft) on the left side of the Gizmo, and record the air temperature. Then, repeat with the probe on the land on the right side of the Gizmo.

Finally, move the probe to the land-sea boundary and record the type of breeze (sea or land breeze) and wind speed. Record data for each time listed in the table below.

Time	Ocean air temperature (°F)	Land air temperature (°F)	Sea breeze or land breeze?	Wind speed (mph)
6:00 a.m.				
9:00 a.m.				
12:00 p.m.				
3:00 p.m.				
6:00 p.m.				
9:00 p.m.				
12:00 a.m.				
3:00 a.m.				

3. **Calculate:** For both the ocean air temperature column and land air temperature column, find the temperature range by subtracting the lowest temperature from the highest.

A. How much does the temperature over the ocean change in one day?

B. How much does the temperature over the land change in one day?

4. **Analyze:** Compare the air temperatures to the breezes.

A. At 6:00 a.m., where was the warmest air?

B. At 6:00 a.m., in which direction did the breeze blow?

C. At 3:00 p.m., where was the warmest air?

D. At 3:00 p.m., in which direction did the breeze blow?

5. **Summarize:** What is always true when there is a land breeze?

What is always true when there is a sea breeze?

6. **Draw conclusions:** In general, the land changes temperature much more rapidly than the ocean. How does this fact explain the existence of land breezes and sea breezes?

7. **Extend your thinking:** With the probe placed on the land-sea boundary, monitor the wind speed. Click **Pause** when the strength of the sea breeze is at a maximum.

A. At what time of day is the sea breeze strongest?


B. Use the **Weather probe** to measure the land-air and ocean-air temperatures. What are these temperatures at this time?

C. Click **Play**, and then click **Pause** when the strength of the land breeze is at a maximum. What is the time?

D. What are the land- and ocean-air temperatures now? \_\_\_\_\_

E. The wind changes direction at approximately 9:10 a.m. and 12:10 a.m. What is true about each of these times?

\_\_\_\_\_

<b>Activity B:</b>  <b>Convection currents</b>	<u>Get the Gizmo ready:</u>	
	<ul style="list-style-type: none"><li>Click <b>Reset</b>.</li><li>Turn on the <b>Drifting balloon</b>.</li></ul>	

**Question: Why do land breezes and sea breezes occur?**

1. Observe: Click **Play**, and observe the balloon for a period of 48 hours. **Pause** the simulation whenever the balloon changes direction. Describe what you see in the space below.

\_\_\_\_\_

\_\_\_\_\_

2. Analyze: During what time period does the balloon drift in a clockwise direction? \_\_\_\_\_

During what time period does the balloon drift in a counterclockwise direction? \_\_\_\_\_

3. Gather data: The diagram at right shows the scene at 6:00 a.m. Use the **Weather probe** to find and label the temperature at each of the numbered locations.

Next, find the wind direction between the points on the diagram. Draw arrows to represent the movement of air.

Which points represent the lowest and highest temperatures on the diagram?

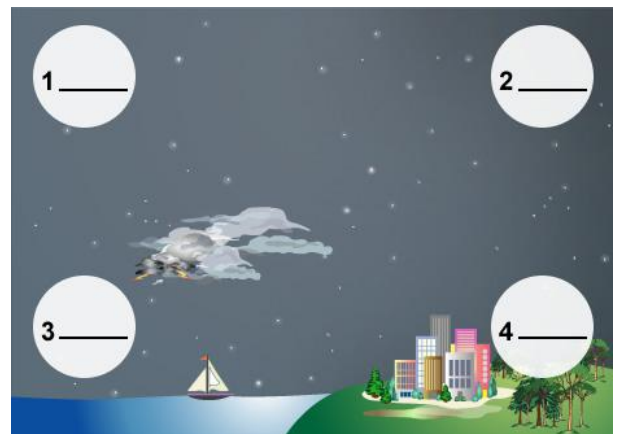
Lowest: \_\_\_\_\_ Highest: \_\_\_\_\_

4. Analyze: In which direction is the hottest air in the diagram moving?

\_\_\_\_\_

In which direction is the coldest air in the diagram moving?

\_\_\_\_\_



This pattern—in which low-density, hot air rises while high-density, cold air sinks—is an example of **convection**. The resulting circular flow of air is called a **convection current**.

5. Gather data: Click **Play**, and then click **Pause** at 3:00 p.m. Use the **Weather probe** to find and label the temperature at each of the



numbered locations.

Find the wind direction between the points as you did before. Draw arrows to represent the movement of air.

Which points represent the lowest and highest temperatures on the diagram?

Lowest: \_\_\_\_\_ Highest: \_\_\_\_\_

6. Analyze: In which direction is the hottest air in the diagram moving? \_\_\_\_\_

In which direction is the coldest air in the diagram moving? \_\_\_\_\_

7. Explain: What causes the counterclockwise flow of air in the afternoon? \_\_\_\_\_

8. Observe: Place the **Weather probe** at the land-sea boundary, and click **Pause** when the sea breeze is strongest.

A. What do you notice in the sky at this time? \_\_\_\_\_

B. Click **Play**, and then pause the simulation when the land breeze is strongest. What do you notice in the sky now?

\_\_\_\_\_

9. Explain: Clouds often form when a large mass of warm, moist air rises quickly and cools, resulting in **condensation** of the water vapor.

Based on this statement, why do clouds tend to form around 3:00 p.m. and 6:00 a.m.?

\_\_\_\_\_

I-K. *Bill Nye - Wind*

I-L. **Wind** [Ediscio](#) Flash Cards

Statistics:

# of flashcards known:  # of flashcards unknown:

I-M. *Land/Sea Breezes Check with Senteo*

What was your score on this practice quiz?

Which questions did you answer incorrectly?

How did/can you master the concepts in this practice quiz?

I-N. **Summary of Weather Foldable - Complete ¼ on wind**

Fold two sheets of paper like the sample in your classroom. Then go to the [science vodcasts site](#) to download/view the SlideRocket posted for the “Weather Foldable - Wind.” You can also view the SlideRocket [here](#).

I-O. **Wind** [Standard Check](#)

Percent Score

What was your score on this standard check?

Which questions did you answer incorrectly?

Will you be retaking this standard check?

How did/can you master the concepts in this standard check?



## II-A. Air Pressure In A Bottle Lab

### Purpose:

- 1) To observe the increase in temperature as air is compressed.
- 2) To weigh the additional air which is added to the bottle.
- 3) To observe the decrease in temperature as air expands.

### Materials:

2 liter pop bottle                      thermometer inside bottle  
"fizz-keeper"                      triple beam balance

### Procedure:

1. Make sure the balance is "zeroed". Measure the mass of the bottle (with the thermometer and the fizz-keeper).

Record the mass here in grams:  g

Record the highest lighted temperature on the thermometer:  F

2. Pump the fizz-keeper 50 times. Record the highest temperature:  F
3. Pump the fizz-keeper another 50 times. Record the highest temperature:  F
4. Pump the fizz-keeper another 50 times. Record the highest temperature:  F
5. Pump the fizz-keeper another 50 times. Record the highest temperature:  F
6. Make sure the balance is still zeroed. Measure the mass of the bottle (with the thermometer and the fizz-keeper).

Record the mass here in grams:  g

7. Subtract the mass before you started adding air to the bottle (from #1 above) from the current mass (#6).

Mass of air added to the bottle:  g

8. How much did the temperature increase from the beginning to the end?  F
9. Quickly unscrew the fizz-keeper. Watch the temperature for about one minute. What happens to the temperature?
10. How would this "fizz-keeper" help keep the fizz in an opened bottle of soda?

- 
11. List variables you have learned about that can change the pressure of a substance.

\*   
\*   
\*   
\*

12. From today's results, explain why temperature decreases when altitude increases.

## II-B. Boyle's and Charles' Laws [Gizmo](#)

\*\*\* (Activity B must be done, Activity A is optional)

### Student Exploration: Boyle's Law and Charles' Law

**Vocabulary:** absolute zero, Boyle's law, Charles' law, Kelvin scale, pressure

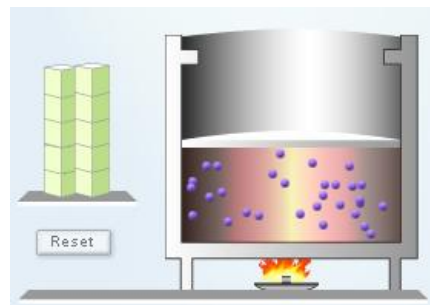
**Prior Knowledge Question** (Do this BEFORE using the Gizmo.)

A small helium tank measures about two feet (60 cm) high. Yet it can fill over 50 balloons! How can such a small tank contain enough helium to fill so many balloons?

\_\_\_\_\_

**Gizmo Warm-up**

On the *Boyle's Law and Charles' Law* Gizmo™, check that the **BOYLE'S LAW** tab is selected. The Gizmo shows a container of gas; the little purple spheres represent molecules.



1. Observe the particles. Are they all moving at the same speed?
- \_\_\_\_\_

2. How do the particles interact with the walls and lid of the container?
- \_\_\_\_\_

These interactions contribute to the **pressure** on the walls of the container. Pressure is defined as force per unit area. The SI units of pressure are newtons per square meter ( $\text{N/m}^2$ ), or pascals (Pa).

3. Slowly drag the temperature (**T**) slider back and forth. (Note: In this Gizmo, the **Kelvin scale** is used to measure temperature. On the Kelvin scale, 0 degrees is **absolute zero**, the coldest possible temperature. Absolute zero is equal to  $-273.15^\circ\text{C}$  or  $-459.67^\circ\text{F}$ )

- A. How does the change in temperature affect the speed of the molecules?
- \_\_\_\_\_

- B. How does the change in temperature affect the volume of the container?
- \_\_\_\_\_

<b>Activity A:</b>  <b>Boyle's Law</b>	<u>Get the Gizmo ready:</u> <ul style="list-style-type: none"><li>On the <b>BOYLE'S LAW</b> tab, set the temperature to 300 K and press <b>OK</b>.</li></ul>	
--	--	--

**Question: How does pressure affect the volume of a gas?**

2. Form hypothesis: In this experiment, you will pile weights on the lid of the container of gas. What do you think will happen as more weight is added to the lid?
- \_\_\_\_\_

3. Notice: Look at the **DESCRIPTION** pane. What is the mass of the lid?
- \_\_\_\_\_

How much pressure does the lid exert on the gas? \_\_\_\_\_

4. Collect data: Using the **Select mass** slider to place weights on the lid, record the pressure and volume of the gas for each of the following settings.

Added mass on the lid	Total mass (lid + added mass)	Pressure*	Volume
0 kg	10 kg	_____	_____
10 kg	20 kg	_____	_____
20 kg	30 kg	_____	_____
30 kg	40 kg	_____	_____

\*This model does not include atmospheric pressure, which is  $101,325 \text{ N/m}^2$ .

5. Analyze: As the pressure increases, what happens to the volume of the gas? \_\_\_\_\_

This relationship is called **Boyle's law**.

6. Calculate: Compare the pressure and volume values in your data table.

- A. How did doubling the pressure change the gas volume? \_\_\_\_\_
- B. How did tripling the pressure change the gas volume? \_\_\_\_\_
- C. How did quadrupling the pressure change the gas volume? \_\_\_\_\_

7. Predict: If the added mass on the lid was 50 kg, a total mass of 60 kg would exert pressure on the gas inside the container. What would be the volume of the gas? \_\_\_\_\_

8. Test: Test your prediction using the Gizmo. What is the volume of the gas? \_\_\_\_\_

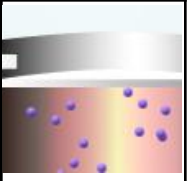
Was your prediction correct? \_\_\_\_\_

9. Create a graph: Select the GRAPH tab. Set the mass slider to 0 kg, and click **Record** to plot a point on the graph. Plot a point for each possible mass to create a graph showing the relationship between pressure and volume.

- A. What is the shape of the graph? \_\_\_\_\_
- B. How does this graph illustrate Boyle's law? \_\_\_\_\_

10. Apply: Think about a small helium tank that can fill 50 balloons. What must be true about the helium in the tank compared to the helium in the balloons?

\_\_\_\_\_

<b>Activity B:</b>  <b>Charles' Law</b>	Get the Gizmo ready:	
	<ul style="list-style-type: none"> <li>• Select the CHARLES' LAW tab.</li> <li>• Set the <b>Mass</b> to 0 kg and click <b>OK</b>.</li> </ul>	

**Question: How does temperature affect the volume of a gas?**

1. Form hypothesis: How will the volume of a gas change as the temperature rises and falls?

\_\_\_\_\_

2. Collect data: Record the pressure and volume of the gas at each of the given temperatures.

Temperature	Pressure*	Volume
100 K	_____	_____
200 K	_____	_____
300 K	_____	_____
400 K	_____	_____
500 K	_____	_____

\*This model does not include atmospheric pressure, which is 101,325 N/m<sup>2</sup>.

3. Analyze: As the temperature increases, what happens to the volume of the gas?

\_\_\_\_\_

This relationship is called **Charles' law**.

4. Explain: Based on the motions of the gas molecules, why do you think the volume changed as it did when the temperature was increased? \_\_\_\_\_

5. Think about it: Why do you think the pressure was the same in each test? \_\_\_\_\_

\_\_\_\_\_

6. Calculate: Compare the pressure and volume values in your data table.

A. How did doubling the temperature affect the gas volume? \_\_\_\_\_

B. How did tripling the temperature affect the gas volume? \_\_\_\_\_

C. How did quadrupling the temperature affect the gas volume? \_\_\_\_\_

7. Predict: Suppose the temperature was 50 K. What would be the volume of the gas? \_\_\_\_\_

8. Test: Test your prediction using the Gizmo. What is the volume of the gas? \_\_\_\_\_

Was your prediction correct? \_\_\_\_\_

9. Create a graph: Select the GRAPH tab. Set the temperature slider to 50 K, and click **Record** to plot a point on the graph. Plot a point every 50 degrees to create a graph showing the relationship between temperature and volume.

A. What is the shape of the graph? \_\_\_\_\_

B. How does this graph illustrate Charles' law? \_\_\_\_\_

10. Apply: Based on what you learned, what would happen to a balloon placed in the freezer?

\_\_\_\_\_

What would happen to a balloon placed in a warm oven? (Assume it doesn't pop.)

\_\_\_\_\_

11. Think and discuss: Consider temperature, pressure, and volume. How does the mathematical relationship in Boyle's law compare to that in Charles' law?

\_\_\_\_\_

## II-C. Julius Sumner Miller Videos

Enjoy and absorb the inspired energy that JSM contains within his being. This is a man that has a true love of science. Watch the video on the iPods, and let the hilarity ensue.

What is your favorite experiment?

\_\_\_\_\_

## II-D. “A Weighty Matter” story

*This is a story that you can find along with the answer keys. Read the short story and answer these questions.*

What “problem” did Torricelli face in his experiment that led him to discover that air exerts pressure? \_\_\_\_\_

How did the height of mercury change on sunny days compared to stormy days?

\_\_\_\_\_

Torricelli’s discoveries led to the first \_\_\_\_\_, a tool measuring \_\_\_\_\_.

## II-E. Pressure Poem

Math problem: pressure knowledge + creativity = great pressure poem.

Fill in the blanks, either here or on the blog ([Crazy 8’s](#) [Gator 8’s](#) [V-8’s](#)), in relation to pressure.

\_\_\_\_\_

One word naming topic

\_\_\_\_\_

Two words that mention “ingredients” of the topic

\_\_\_\_\_

Three words - a metaphor/simile between the topic and a sport

\_\_\_\_\_

Four words explaining the topic

\_\_\_\_\_

One word - a synonym for the topic

## II-F. *Crushing Cans Demo and Blog Response (video)*

Go to your science blog ([Crazy 8’s](#) [Gator 8’s](#) [V-8’s](#)). Impart knowledge to the rest of the blogosphere.

## II-G. *Pressure (High and Low) Senteo Examples*

What was your score on this practice quiz? \_\_\_\_\_  
Which questions did you answer incorrectly? \_\_\_\_\_  
How did/can you master the concepts in this practice quiz?

\_\_\_\_\_

## II-H. Pressure [Ediscio](#) Flash Cards

Statistics:

# of flashcards known: \_\_\_\_\_ # of flashcards unknown: \_\_\_\_\_

## II-I. Pressure Essays on [Classmarker](#) or Blog ([Crazy 8's](#) [Gator 8's](#) [V-8's](#))

Go to the blog (or [classmarker.com](#)). Once there, please share all that you know about the pressure essay questions. It really helps to be thorough.

## II-J. Weather Foldable - complete $\frac{1}{4}$ on pressure

Fold two sheets of paper like the sample in your classroom. Then go to the [science vodcasts site](#) to download/view the powerpoint posted for the "Weather Foldable - Pressure."

## II-K. Pressure [Standard Check](#)

Percent Score \_\_\_\_\_

What was your score on this standard check? \_\_\_\_\_  
Which questions did you answer incorrectly? \_\_\_\_\_  
Will you be retaking this standard check? \_\_\_\_\_  
How did/can you master the concepts in this standard check?

\_\_\_\_\_