Inquiry 5.1:
Convection Currents in the Air

Name _____

Date _____

Period ____

Background:

(3) 1. Fill in the chart to describe the relationship between temperature, density, and movement of AIR.

Temperature (warm or cold)	**Density** (more or less)	**Movement** (rises or sinks)	**Diagram** (show the spacing of the molecules)
Warm			
Cold			

(1) 2. ***What do you think:*** If a mass of warm air rises, what happens underneath that warm air?!

_____

_____

Listen as the teacher describes the procedure. Then answer questions #3 - 9.

Materials: Two Convection Tubes, plastic tubing, two cups of ice water, two candles, punk stick, lighter, flashlight, empty beaker.

(1) **Testable Questions:** Fill in the rest of each question.

3a. What speed and direction does air move when two _____ air masses meet?

3b. What speed and direction does air move when two _____ air masses meet?

3c. What speed and direction does air move when a _____ air mass meets a _____ air mass?

Prediction/Hypothesis:

(1) 4. Write your prediction here.

Cold and Cold Air: _____

_____

Hot and Hot Air: _____

_____

Cold and Hot Air: _____

_____

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(4) 5. **Procedure**: Fill in the blanks for JUST the **"hot air vs. cold air**" experiment.

HOT AIR vs. COLD AIR:

1. Fill one cup to the brim with _____ _____.

2. _____ the cup of ice under one side of the convection tube set-up.

3. _____ for 1-2 minutes for the air to get cold.

4. Light the punk stick and candle. Hold the punk stick _____ your head when not in use.

5. Center the _____ under the other side of the convection tubes.

6. Insert the punk stick partially down the _____ air tube for _____ seconds, then slowly remove it.

7. Shine the flashlight at all parts of the convection tube set up.

8. Observe and record the _____ and _____ of the air/smoke.

Independent Variable:

(1) 6. We will be using the ice and candles to change only one thing in each test. What is that one thing?

_____

Dependent Variable:

(1) 7. We will be observing the air in each experiment. What is it ABOUT the air that we are observing and recording?

_____

Controlled Variables:

(1) 8. Describe what needs to stay the same between each set-up to be a fair test.

- Amount of Smoke = _____
- Placement of Ice/candle = _____

(3) 9. **Safety:** Write in any safety concerns about the equipment listed below.

Candle/wax: _____

_____

Punk Stick/smoke: _____

_____

Flashlight: _____

_____

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Data Collection and Presentation

(12) 10. Use the space below to record your data. Use words and diagrams this time! Remember to label and explain everything. *Include a **TITLE!***

Title: _____

TEMP. OF AIR	DIAGRAM	DESCRIPTION
COLD & COLD		
HOT & HOT		
COLD & HOT		

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Conclusions:

(4) 11. **Scientific Explanation**: For the hot vs. cold set- up, explain **WHY** air circulates the way it does. (Hint: use words like cooled down, heated up, more or less dense, rose, sunk, filled in, replaced, etc.)

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(3) 12. **Problems:** Describe any problems, how they might have affected the results and suggest a possible improvement.

Problem: _____

_____

How It Affected the Results: _____

_____

Improvement: _____

_____