Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_

**Investigating How Warm Air and Cold Air Move**

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| **QUESTION/PURPOSE:** **Manipulated Variable (MV)** **Responding Variable(RV)**How does the temperature of the air effect how the air moves? |
| **HYPOTHESIS (IF, THEN, BECAUSE)** **:** **Manipulated Variable (MV)** **Scientific Reason (WHY)** **Responding Variable (RV)** |
| **Manipulated Variable Units** | **Responding Variable Units** | **Controlled Variable(s) Units** |
| **PROCEDURES: Manipulated Variable (MV)** **Responding Variable (RV)** **Controlled Variable(s)** **Repeated Trials** **Logical Steps**1. Connect top and bottom of 2 convection tube. Add the plastic tubing, the funnel and the tin dish as seen in the demo model.
2. When the equipment is set up, ask the teacher to pour hot water into the dish.
3. Place hot water dish under the convection tube. BE CAREFUL, THE WATER IS VERY HOT!
4. When you are ready, ask the teacher to light the punk sticks.
5. Immediately blow out the punk.
6. Place the punk over the tin cup, inside the large part of the funnel so that the smoke goes inside the funnel. **Do not put punk into the tubing, or touch the tubing or funnel!**
7. Kneel down so you are eye level with the convection tube. Use the flashlight to help you see the smoke. Discuss with your partners how the smoke moves.
8. Tamp out your punk in the tin cup.
9. Record your observation in the data table.
10. Carefully pour out the hot water and refill the dish with ice and ice water.
11. Place ice water dish under convection tube.
12. Repeat steps 4-9.
13. Clean up and put all supplies away
 | **MATERIALS Measuring Device****\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |

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| **DATA TABLE: Title (Manipulated vs. Responding) Trials** **Units Averages** **TITLE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| How did the air move over the hot water? | How did the air move over the cold water? |

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| 1. Why did we use the smoke? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Why do you think the air above the hot water moved the way it did?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_1. If the Earth’s surface is hot, what will happen to the air above it? What if the surface is cold?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2. Do you think these air masses would mix? Why or why not? (Use words such as density in your explanation).\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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