

Unit
4Handout
114*Lesson 4: Investigating Air Temperature and Movement Analysis***Purpose:**

To analyze data from the lesson 4 investigations and apply the concepts to related ideas within meteorology.

Guiding Questions:

How do surface temperatures on the earth affect the temperature of the air above it and the way air moves?

Directions. Answer the following questions regarding our investigations in lesson 4. Use evidence (supporting data) from the investigation to support your answers.

1. You may have predicted that the air temperature above a cold substance will decrease. However, we did not observe this happen. Write an explanation for why the air temperature in the convection tube with hot water increased whereas the air temperature in the convection tube with ice did not change. (Hint: think about convection and what happens with heated/cooled substances.)
2. Based on the second activity (handout 113), how did the air, visible because of the smoke, move in the Convection Tube with crushed ice? Explain why you think this happened. Use evidence from the lesson to support your answer.
3. What happened to the air inside the Convection Tube with hot water? Explain why you think this happened.

4. Why do you think moisture formed on the inside of the Convection Tube with hot water? How do you think this relates to the process of cloud formation on earth?
5. Apply what you observed in this lesson to the earth. If the earth's surface is colder than the air above it, what will happen to the air? If the surface is hot and damp, what will happen to the air above it?
6. Read "Air Masses" on page 66. What can happen where two air masses meet?
7. Develop a working definition for "stable air mass" and "unstable air mass." To help you with this, think about how the smoke moved in each tube: which was more stable, which was unstable? How is this connected to surface and air temperature?
8. Apply what you observed in this lesson to cloud formation. When do you think clouds are more likely to form: when air remains close to the earth's surface or when air rises and moves quickly to high altitudes? Support your choice with evidence from this lesson.