

Unit : Handout :
4 : 11

Lessons 3-6 Review

Purpose: Review the main ideas from the first investigations of the unit

Guiding Questions: No guiding question for this sheet.

Directions. Write a response to the following questions. Cite evidence as needed to support your answer.

1. What is the difference between weather and climate?

Weather describes the current state and condition of the atmosphere at a given location. Climate describes the longterm trends and occurrences of weather at a given location.

2. What is the major source of earth's heat?

The major source of earth's heat is the sun.

3. Why doesn't this heat easily escape from earth's atmosphere?

Greenhouse gases traps heat within the atmosphere.

4. What evidence do we have that earth's surfaces do not heat/cool at the same rate?

We modeled this in an investigation. Soil heated and cooled more quickly than water. Water heated slowly and took longer to cool. There is also evidence of this happening in the real world; simply observe the temperature changes on land and in water over a 24-hour period.

5. How do the surfaces of the earth affect the air above it? What evidence do you have to support this?

Warm surfaces warm the air above it while cool surfaces cool the air above it. We modeled this using hot and cold water. We measured the temperature of the air around these substances and noticed the hot water raised the temperature of the air above it but the cool water did not (since cold air is dense). This can also be observed by tracking air temperature over land and water.

6. How does a warm/hot surface affect the movement of the air above it? What evidence do you have to support this?

A warm/hot surface warms the air above it. This causes the air to become less dense and rise. We modeled this using hot water, a candle, and smoke. The smoke rose above the hot water and candle as the air became less dense as it was heated.

7. How does a cool/cold surface affect the movement of the air above it? What evidence do you have to support this?

A cool/cold surfaces cools the air above it. This causes the air to become more dense and sink. We modeled this used ice water and smoke. The smoke mostly stayed near the bottom of the system that contained the ice water.

8. What happens when warm/hot air masses and cool/cold air masses meet? What evidence do you have to support this?

Where different temperature air masses meet is called a weather front. Precipitous weather, storms, and clouds form at these boundaries. We observed this on the wind and weather maps. When we identified a weather front on the wind map, we looked at radar and were able to see storm systems. Also, we know this happens because air often contains water vapor (gas). When that gas comes in contact with a cool air mass it condenses and forms clouds.

9. On the wind weather map we examine each day, how do we know where areas of low pressure are found? High pressure? Weather fronts?

Low pressure areas are shown as air rotating inward (counterclockwise in the northern hemisphere). High pressure areas are shown as air rotating outward (clockwise in the northern hemisphere). Weather fronts are shown where two wind zones meet each other and change directions; typically there is a boundary or line that seems to divide them where they meet.

10. Look at the drawing below. Assume that the water is warm and the land is cool.

- a. Where is the low pressure?

Above the water.

- b. Where is the high pressure?

Above the land.

- c. Where is the air the most dense?

Above the land.

- d. Where is the air the least dense?

Above the water.

- e. Where will the air move too and from? Why?

The air will move from the land and to the water. The water will heat the air above it causing it to become less dense and rise. The cooler, more dense air will spread into where the warm, dense air used to be. This is called convection and causes wind.

