

1. A sealed glass container of air contains an unknown quantity of water vapor but no visible moisture or condensation. The container is cooled 20 degrees less than its original temperature. There is still no visible moisture or condensation. Therefore: (circle all that apply)

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



- A. The dew point has increased.
- B. The dew point has decreased.
- C. The dew point has not changed.
- D. The relative humidity has increased.
- E. The relative humidity has decreased.
- F. The relative humidity has not changed.
- G. The mixing ratio has increased.
- H. The mixing ratio has decreased.
- I. The mixing ratio has not changed.

2. Your classroom is 15 meters long, 5 meters wide, and 3 meters tall. If the mixing ratio today is 5.5 g/kg, how much total water is contained in the classroom air? Show your work.

$$\text{Volume} = 15\text{m} \times 5\text{m} \times 3\text{m} = 225\text{m}^3 = 225\text{kg}$$

$$2 \left( \frac{5.5\text{g}}{\text{kg}} \right) \left( \frac{225\text{kg}}{1} \right) = \boxed{1237.5\text{g}}$$

3. The temperature of this classroom was raised from its normal 73F to 80F. The air inside this classroom is still the same air as before the temperature shift.

Therefore: (circle all that apply)

- A. The dew point has increased.
- B. The dew point has decreased.
- C. The dew point has not changed.
- D. The relative humidity has increased.
- E. The relative humidity has decreased.
- F. The relative humidity has not changed.
- G. The mixing ratio has increased.
- H. The mixing ratio has decreased.
- I. The mixing ratio has not changed.

4. The mixing ratio today is 10 g/kg.

2 A. How much water would be in 2 kg of air? 20g

$$\left( \frac{10\text{g}}{\text{kg}} \right) \left( \frac{2\text{kg}}{1} \right) = 20\text{g}$$

1 B. About how cold would it need to get tonight to produce dew? Between 50°F and 55°F

5. If the mixing ratio is 7.64 g/kg and the temperature is 75°F, what is the relative humidity? Show math below.

$$2 \frac{7.64\text{g/kg}}{22.76\text{g/kg}} \times 100 = 33.5\%$$

6. The dew point today is 45°F. Tonight, the air cools to 41°F.

Will dew form tonight? Yes No

When the air temperature reaches 41°F, what will the dew point be? 41°F

When the air temperature reaches 41°F, what will the relative humidity be? 100%



7. The weather service predicts that the dew point temperature will not change in the next 48 hours. Therefore, we can reasonably assume that after the sun goes down tonight:

- A. The relative humidity will go up.
- B. The relative humidity will go down.
- C. The relative humidity will not change.
- D. There is not enough information to answer.

8. The wind has been blowing from the Northwest for several days straight. Tonight it changes direction and starts blowing from the east. What will probably happen to the dew point and why?

Wind from the NW is from a cold location, which requires that the dew point is low (cold air = dry air). Dew points increase towards the east, because of the warm bodies of water - Gulf of Mexico and Atlantic Ocean. If our wind shifts and starts blowing from the east, our dew point almost always goes up, since the source of the air is from

9. According to the last reading, what are some of the activities that you could have students do regarding evaporation?

List at least four different evaporation experiments they could do:

Over these warm bodies of water.

#9. From the reading. Note that each example is an experiment that answers a question. For example, which evaporates faster - glass of water in still air or glass of water in front of a fan?

Clouds:

- |                        |                        |                        |                         |
|------------------------|------------------------|------------------------|-------------------------|
| 1. <u>altocumulus</u>  | 2. <u>lenticular</u>   | 3. <u>altostratus</u>  | 4. <u>cumulonimbus</u>  |
| 5. <u>nimbostratus</u> | 6. <u>cirrostratus</u> | 7. <u>cumulonimbus</u> | 8. <u>stratocumulus</u> |
| 9. <u>mammatus</u>     | 10. <u>altocumulus</u> | 11. <u>cirrus</u>      | 12. <u>cirrocumulus</u> |