Teacher Survey

Instructions: Please complete the following evaluation.

1. Did you make any adjustments to the learning module? If so, what did you change or omit?

2. From your observations, are the students more interested in atmospheric science?

3. What part of the lesson was most effective or interesting to them?

4. What concept did the students have most trouble understanding or applying?

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Student Survey

Please distribute this survey to the students before and after completing the module.

Instructions: Circle the answer that best describes your feelings about science.

1. I like science.
    a. I strongly disagree.
    b. I disagree.
    c. I am indifferent or unsure.
    d. I agree.
    e. I strongly agree.

2. How often do you talk to your *family* about what you do in science class?
    a. Never
    b. Rarely (less than once a week)
    c. Once a week
    d. A few times a week
    e. Every day

3. How often do you talk to your *friends* about what you do in science class?
    a. Never
    b. Rarely (less than once a week)
    c. Once a week
    d. A few times a week
    e. Every day

4. I think science will be useful when I am older.
    a. I strongly disagree.
    b. I disagree.
    c. I am indifferent or unsure.
    d. I agree.
    e. I strongly agree.

5. I would like to be a scientist when I am older.
    a. I strongly disagree.
    b. I disagree.
    c. I am indifferent or unsure.
    d. I agree.
    e. I strongly agree.

Effectiveness Assessment

Part 1: Pre and Post Assessment (Student Evaluation)

Instructions: Please distribute and score the **Student Evaluation** for each student before and after completing the module. Each question is worth 1 point.

Student Evaluation

Instructions: After completing the lesson on ice storms, please have the students answer the following questions below.

1. Which of the following is not true about supercooled water?
    a. Supercooled water is liquid water that exists at temperatures below freezing.
    b. Supercooled water is pure water that occurs in the liquid state below 32^{o}F.
    c. Supercooled water requires a surface or impurity to freeze upon.
    d. Supercooled water can occur in clouds below -60^{o}C.

2. A band of freezing rain occurs _____ with respect to the center of wintertime low pressure system.
    a. behind the warm front
    b. behind the cold front
    c. north of the warm front
    d. north of the cold front

3. Freezing rain requires all except
    a. wind speeds that exceed 35 mph.
    b. a warm melting layer above the surface.
    c. surface temperatures below freezing.
    d. a surface to freeze upon.

4. A freezing rain warning is issued by the NWS when
    a. freezing rain occurs for more than 6 hours.
    b. freezing rain, sleet, or snow occurs for more than 24 hours.
    c. an ice accumulation is forecasted to exceed ¼ inch.
    d. an ice accumulation is forecasted to exceed 0.01 inch.
    e. all of the above

5. Liquid water is less dense than ice. T F

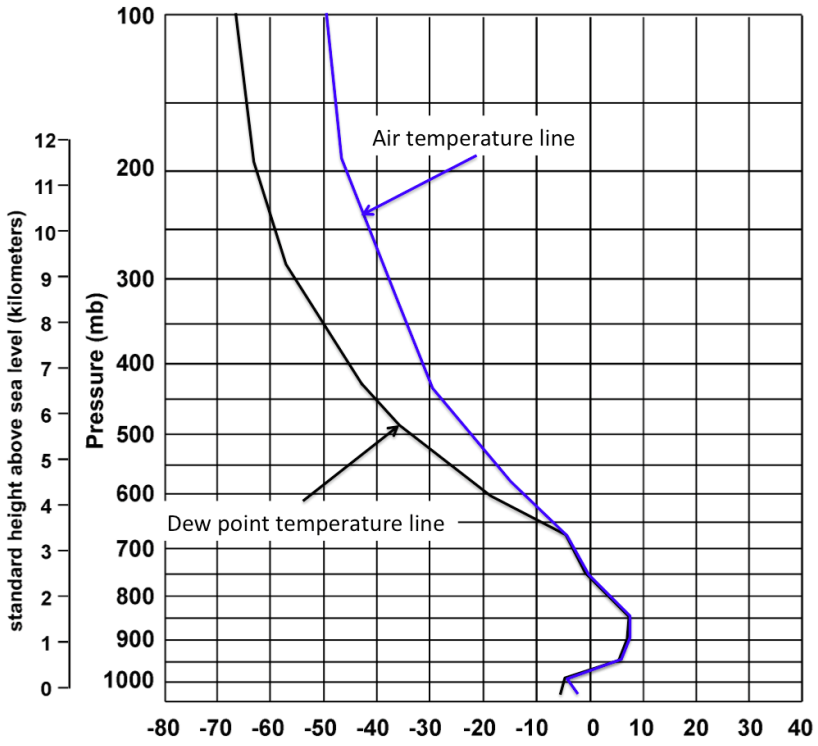
6. The molecular structure of ice is hexagonal. T F

7. Pure water is able to remain a liquid at temperatures below freezing. T F

8. Dust is an excellent surface by which water is able to freeze upon. T F

9. Briefly describe the difference between sleet and freezing rain. How does each type of precipitation form?

10. What is the difference between the air temperature and dewpoint temperature at surface?



a. 0 ºC
b. 4 ºC
c. 10 ºC
d. 15 ºC

Part 2: Math & Science Proficiency (Take Home Assignment: Part 3)

Please score **Take Home Assignment**: **Part 3** for each student using the rubric below. This problem is aligned with the following academic standard:

CCSS.ELA-LITERACY.RST.6-8.3
Grade 6-8: Science and Technical Subjects: Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

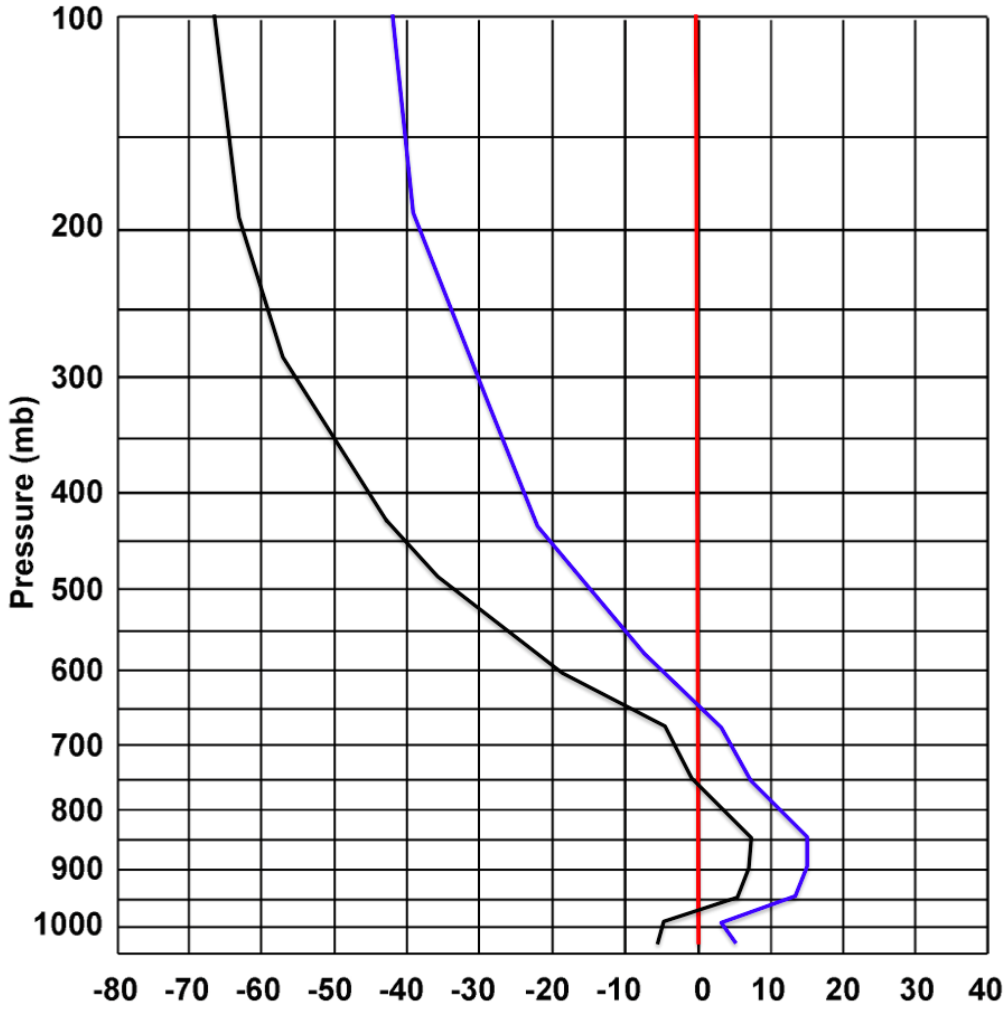
Scoring Rubric

Questions	Score (0 – 3)
Did the student answer Question 1 correctly?	
Did the student answer Question 2 correctly?	
Did the student answer Question 3 correctly?	
Did the student answer Question 4 correctly?	
Did the student answer Question 5 correctly?	
Did the student answer Question 6 correctly?	
Did the student answer Question 7 correctly?	
Did the student answer Question 8 correctly?	

0 – Incomplete
1 – Completed with incorrect answer
2 – Complete with small errors
3 – Complete with correct answer

Take Home Assignment: Part 3. Atmospheric Soundings

Instructions: Using the following sounding to answer the questions below. Temperature is shown on the x-axis in degrees Celsius and the pressure is shown in millibars. The blue line represents the air temperature. The black line represents the dewpoint temperature. The red line represents the freezing line (0°C).



1. What is the name of the instrument pack that records the vertical temperature profile?

2. At what pressure level does the sounding begin?

3. What is the air temperature at 650 mb?

4. At which pressure level does the air temperature equal -30°C?

5. Is there a melting layer on the sounding? If so, circle it and label it on the sounding.

   Yes No

6. Is there a surface sub-freezing layer? If so, circle and label it on the sounding.

   Yes No

7. Using your answers to #5 and #6, is this sounding favorable for freezing rain?

   Yes No

8. If not, what type of precipitation would expect to fall at the surface?

   a. Snow b. Sleet

   c. Rain d. I expect freezing rain to fall