8th Grade Weather & Climate Unit
Summative Assessment Rubrics

1. Why was it foggy in Dover, Delaware, on Monday, Tuesday, and Wednesday mornings?

This item measures the student's understanding that there is a pattern and relationship between weather data and atmospheric conditions.

Criterion for a complete response:

1. States that the dew point and air temperature are the same or the humidity is 100%.

Code	Response
	Complete Response
20	States dew point and temperature are the same.
21	States humidity is 100%.
29	Any other correct response.
	Partially Correct Response
10	States condensation is taking place, but does not make connection between humidity or dew point and temperature.
19	Any other partially correct response.
	Incorrect Response
70	States atmospheric pressure "causes fog".
71	States wind "causes fog".
72	States temperature "causes fog".
76	Repeats the questions or some other response already given.
79	Any other incorrect response.
	Non Response
90	Crosses out, erases, illegible or impossible to interpret.
99	Blank.

2. Explain why it was no longer foggy at 11 o'clock on Tuesday.

This item measures the student's understanding of the sun driving the physical changes in the earth's atmosphere.

Criterion for a complete response:

1. As the sun heats the earth's atmosphere, water droplets are changed back to water vapor i.e. evaporation takes place.

Code	Response
	Complete Response
20	Explains the sun heats the earth's atmosphere and water changes from drops to vapor.
21	Explains the sun heats the earth's atmosphere and evaporation takes place.
29	Any other correct response.
	Partially Correct Response
10	Explains that the sun heats the atmosphere but does not include the phase change of water or evaporation.
11	Explains phase change but does not include the role of the sun's energy.
12	Explains evaporation but does not include the role of the sun's energy.
13	Explains temperature and dew point are separate but does not include the role of the sun's energy.
19	Any other partially correct response.
	Incorrect Response
70	Indicates that wind moves vapor away.
71	Indicates that sun lifts water droplets or vapor.
76	Repeats the stem of the question.
79	Any other incorrect response.
	Non Response
90	Crosses out, erases, illegible or impossible to interpret.
99	Blank.

3. Construct a data table to represent the weather for Monday, Tuesday, and Wednesday mornings.

This item measures the student's ability to organize and represent data in a data table.

Criteria for a complete response:

1. Constructs a complete data table with 3 sets of daily measurement categories of data, i.e. temperature, pressure, dew point/or humidity, wind direction, and wind speed.
2. Measurements must be correctly paired.
3. Data table must contain appropriate labels, headings, and units.

Code	Response
	Complete Response
20	Meets above criteria.
29	Any other correct response.
	Partially Correct Response
10	Includes headings and units in data table, **but** measurements are not correlated with correct day.
11	Omits headings **or** units in data table and makes no more than two errors in data entry.
19	Any other partially correct response.
	Incorrect Correct Response
70	Makes several errors in data table or labels.
76	Repeats the stem of the question.
79	Any other incorrect response.
	Non Response
90	Crosses out, erases, illegible or impossible to interpret.
99	Blank.

Reasonable Example: This is a sample of one data table. There are more ways to make a correct data table.

Day	Temperature	Dew Point	Barometric Pressure	Wind Direction	Wind Speed
Monday	12˚C/57˚F	12˚C/57˚F	1026 mb	NNE	9 km/hr
Tuesday	14˚C/61˚F	14˚C/61˚F	1026 mb	NNE	8km/hr
Wednesday	14˚C/61˚F	14˚C/61˚F	995 mb	SSW	20km/hr

4. Refer to Thursday's weather map. Predict Thursday's weather for Delaware. Explain your prediction using data from the map.

This item measures the student's ability to read and interpret weather maps, and predict weather patterns.

Criterion for a complete response:

1. Makes a weather prediction supported by evidence from the map, e.g., anywhere from partly cloudy to clear, barometer anywhere from 261-301.
   Note: Due to the low pressure system moving off the coast and the high pressure system moving toward Delaware, a complete response would be a prediction using data from the high **or** a prediction using data "between" the two systems.

Code	Response
	Complete Response
20	Meets criterion above.
29	Any other correct response.
	Partially Correct Response
10	Accurately lists indicators of the weather (wind speed, difference between dew point and temperature, rise in barometric pressure) but does not make a weather prediction (fair, clear, or partly cloudy).
11	Indicates clear/fair/partly cloudy weather, but does not support with evidence (barometric pressure rising or dew point and temperature dissimilar.)
19	Any other minimally correct response.
	Incorrect Response
70	States incorrect weather description , example: cloudy, foggy.
71	States readings from the station model.
76	Repeats the stem of the question.
79	Any other incorrect response.
	Non Response
90	Crosses out, erases, illegible or impossible to interpret.
99	Blank

5. Look back at your Thursday weather map. Which pressure system will determine Friday's weather conditions? Explain why.

This item measures the student's ability to read and interpret weather maps, and predict weather patterns.

Criteria for a complete response:

1. Identifies high-pressure system as the system affecting Friday's weather.
2. States that weather systems generally move from West to East (prevailing westerlies.)

Code	Response
	Complete Response
20	Meets both criteria.
21	Meets criteria, but states pressure system moves West to East rather than weather system.
29	Any other correct response.
	Partially Correct Response
10	Identifies high-pressure system.
11	States weather systems generally move West to East.
19	Any other partially correct response.
	Incorrect Response
70	Identifies the low-pressure system.
76	Repeats the stem of the question.
79	Any other incorrect response.
	Non Response
90	Crosses out, erases, illegible or impossible to interpret.
99	Blank

6. Choose the letter that shows where evaporation takes place from the pond. Explain what happens to water particles in the pond when heated by the sun.

This item measures student's ability to use the particulate model to explain evaporation and to identify where evaporation takes place in the pond.

Criteria for a complete response:

1. Identifies C as the correct location.
2. Explains that as the sun heats the pond, the water particles move faster and some of the particles move into the atmosphere as water vapor.

Code	Response
	Complete Response
20	Meets criteria above.
29	Any other correct response.
	Partially Correct Response
10	Identifies correct location, but discusses only the increased movement of water particles, not indicating movement into the atmosphere.
11	Identifies correct location, but discusses only the movement of particles into the atmosphere, not increased movement and particles.
12	Identifies the wrong or no location, but discusses the increased movement of water particles, not indicating movement into the atmosphere.
13	Identifies the wrong or no location, but discusses the movement of particles into the atmosphere, not indicating increased movement of particles.
14	Identifies the wrong or no location, but discusses both increased movement of particles and movement of particles into the atmosphere.
19	Any other partially correct response.
	Incorrect Response
70	Identifies wrong or no location, with flawed or no explanation.
71	Identifies correct location, with flawed or no explanation.
72	Explains the water cycle only.
76	Repeats the stem of the question.
79	Any other incorrect response.
	Non Response
90	Crosses out, erases, illegible or impossible to interpret.
99	Blank

7.	It is a summer day at this beach. Look at the air movement shown by the arrows in the diagram. Use your knowledge of how temperature affects the density of air to explain why the air moves in this way.

This item measures the student's understanding of convection current. Heated air is less dense and rises; cooler air is more dense and sinks and rushes to take the place of the hotter rising air.

Criteria for a complete response:

1. Explains that the air over the land is warmer, less dense, and rises over the land.
2. Explains that the air over the water is cooler, more dense and sinks.
3. Explains that the cooler, more dense air from the ocean moves toward the land to replace the warm air that has risen.

Code	Response
	Complete Response
20	Meets above criteria.
29	Any other correct response.
	Partially Correct Response
10	Explains the movement of air in terms of temperature differences, but omits density.
11	Explains the movement of air in terms of density differences, but omits temperature.
19	Any other partially correct response.
	Incorrect Response
70	States land is cool and water is warm.
71	States all winds move from West to East.
72	States warm air rises and cold air sinks.
76	Repeats the stem of the question.
79	Any other incorrect response.
	Non Response
90	Crosses out, erases, illegible or impossible to interpret.
99	Blank.

8. Describe how weather and climate are different.

This item measures the student's ability to distinguish daily weather from the climate of an area.

Criteria for a complete response:

1. Describes weather as immediate atmospheric conditions that change daily.
2. Describes climate as long-term weather conditions for a particular location and/or is more stable and predictable than weather.

Code	Response
	Complete Response
20	Meets the criteria.
29	Any other correct response.
	Partially Correct Response
10	Describes weather correctly, but description of climate omits "for a particular location."
11	Describes weather correctly, but omits or confuses climate.
12	Describes climate correctly, but omits or confuses weather.
19	Any other partially correct response.
	Incorrect Response
70	Discusses weather in terms of temperature, but omits other weather factors.
71	States climate occurs over a short period of time, e.g. month to month, year to year.
76	Repeats the stem of the question.
79	Any other incorrect response.
	Non Response
90	Crosses out, erases, illegible or impossible to interpret.
99	Blank

9. One winter the newspaper reported the mildest January on record in Delaware. Many people concluded from the report that the climate in Delaware must have changed. Based on your knowledge of weather and climate, do you agree or disagree? Explain why.

This item measures the student's ability to apply their knowledge of weather and climate to evaluate the validity of a claim.

Criteria for a complete response:

1. Disagrees with the public's conclusion that Delaware's climate has changed.
2. Explains that climatic changes can not be based on data from a single month.

Code	Response
	Complete Response
20	Meets above criteria.
29	Any other correct response.
	Partially Correct Response
10	Disagrees, but explanation is vague, e.g. you would need more data.
19	Any other partially correct response.
	Incorrect Response
70	Takes a position with no explanation of the position.
71	Indicates some knowledge of greenhouse effect/global warming without using this information to respond to the question.
72	Agrees with idea of a climate change.
76	Repeats the stem of the question.
79	Any other incorrect response.
	Non Response
90	Crosses out, erases, illegible or impossible to interpret.
99	Blank