ATMOSPHERE INVESTIGATION AREA
GLOBE SAMPLE STUDENT ASSESSMENT TOOL - PRIMARY SCHOOL

General Instructions to the Teacher:

- This task took 2nd grade students approximately two 45 minutes to complete.
- Directions are generally read to students although some advanced students at the upper primary grades may be able to read and work on their own.
- Students may work individually, or in groups. If group work is the norm for your classroom, it is recommended that the final question be assigned as an activity for individual students or students working with partners as the largest working unit.

Advanced Preparation and Set Up:

- Each item in a GLOBE Classroom Assessment begins with an assessment framework statement / goal that cues the student and teacher to the critical features of the item. If this information is not useful to your students, remove the bold parenthetical statement at the beginning of eacl item.
- It is critical that the students work with colored pictures. Here are some suggestions for dealing with this if you do not have access to a color printer/copier:
    - make one classroom copy of the pictures (laminate them for future use); display the pictures in a prominent place; work as a class to complete items 1 – 4; display this single poster on a bulletin board in a prominent location in the classroom or school
    - use pictures of different cloud types from magazines; this could be a homework assignment OR students could spend an extra day completing this prep work before beginning the activity; if you have enough pictures, continue with activity as written or follow the suggestion above
    - take photographs of your site and use these

Materials:

- one color copy of the six cloud pictures for each student / group
- glue / tape to mount cloud pictures to poster
- paper/area suitable for student posters – butcher paper, several sheets of paper taped together, bulletin board area, paper grocery bags with bottom removed and slit down one side to create large blank area

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(Given data from the GLOBE data archives)

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E.

F.

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1) **(Take GLOBE Measurements: Make cloud observations that are accurate and appropriate)** Divide the pictures into groups by looking at the shape of the cloud. Name the type of cloud that you find in each picture.

A = stratus *B = no clouds or clear*
C = cumulus *D = cirrostratus*
E = cirrostratus *F = altostraus*

2) **(Summarize and Communicate: Ask students to create a presentation that summarizes their knowledge about clouds and cloud types)** Use the pictures to make a poster that tells about clouds. Put the picture of the cloud type that is closest to the earth at the bottom of the poster. Put the picture of the cloud type that is highest in the atmosphere at the top of your poster.

(sequenced from closest to earth to highest in atmosphere)
A C F D/E

3) **(Interpret GLOBE data: Explain the relationship between cloud type and atmospheric location of each cloud type)** Write the name of each cloud next to it. Under the name of the cloud, write where this type of cloud forms in the atmosphere – is the cloud close to the ground, trees and buildings? Very high up in the sky? Or at an in-between level?

A, C are low clouds
F is a middle level cloud
D/E are high level clouds

4) **(Take measurements: Make accurate and appropriate measurements)** Decide how much of the sky is covered with clouds in each of the pictures. Is it MORE than half the sky? LESS than half the sky? Or is the sky clear, with NO clouds? Write the amount of cloud cover under the name of the cloud and its altitude.

A is 70% covered by clouds (> half)
B is 0% covered by clouds (NO clouds)
C is 60% covered by clouds (> half)
D is 10% covered by clouds (< half)
E is 20% covered by clouds (< half)
F is 100% covered by clouds (> half)

5) **(Interpret GLOBE data: Infer patterns & trends in the pictures and explain the relationship between cloud type and precipitation)** Will it rain or snow later in the day from any of these clouds? How can you tell?
Student answers will vary but may contain information related to the height of the clouds in the atmosphere, the color of the clouds or the general cloud cover.
For example:
*It probably will not rain or snow at **site A** – stratus clouds usually do not produce rain or snow.*
*Right now, it doesn't look like it'll rain or snow at **site B** because there are NO clouds in the sky.*
*The cumulus clouds at **site C** could turn into cumulonimbus and cause rain later in the day.*
*The cirrostratus clouds at **sites D and E** are very high up and contain ice crystals but there is not enough water to produce rain or snow.*
*The altostratus clouds at **site F** could produce rain or snow. These clouds are grey which means lots of water in them.*

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Table 1 shows the early morning temperature at each of the school sites from the pictures on your poster.

Table 1: Early morning temperature at Schools

School Site	Temperature °C	Temperature °F
A	12.5	54.5
B	0	32
C	20	68
D	7.8	46
E	14	57.2
F	11	51.8

6) **(Analyze and Compare GLOBE data: Identify similarities and differences)**
Which of these schools has weather MOST LIKE the weather at your school today? What information did you use to decide your answer to this question?

Answers will vary. Students should compare temperature and cloud cover. They may also include other environmental variables such as plant types, geology (hills) or man-made structures (roads, buildings etc.).

7. **(Analyze and Compare GLOBE data: Identify similarities and differences)** Which of these schools has weather MOST DIFFERENT the weather at your school today? What information did you use to decide your answer to this question?

Answers will vary. Students should compare temperature and cloud cover. They may also include other environmental variables such as plant types, geology (hills) or man-made structures (roads, buildings etc.).

Imagine that you are a grown up who lives in a town that has one school. You have a morning radio show. Every morning on your way to work you drive past the school. On your radio show you tell the listeners what the weather is like at the school. You tell the children how to dress for school. Is it important to wear a raincoat? Should they bring an umbrella? etc.

8) **(Communicate: Ask students to compose informal discourse that informs, explains, and persuades)** Choose one of the school sites shown in pictures A - F that you would like to write about. Use the information in the picture and the temperature information in Table 1 to write the radio report that you will give about the school.

Answers will vary. Students will combine information from question 5 as well as temperature data from Table 1. Students may use °C or °F, but should use the temperature information to correctly inform the "radio listeners" how to dress for school.