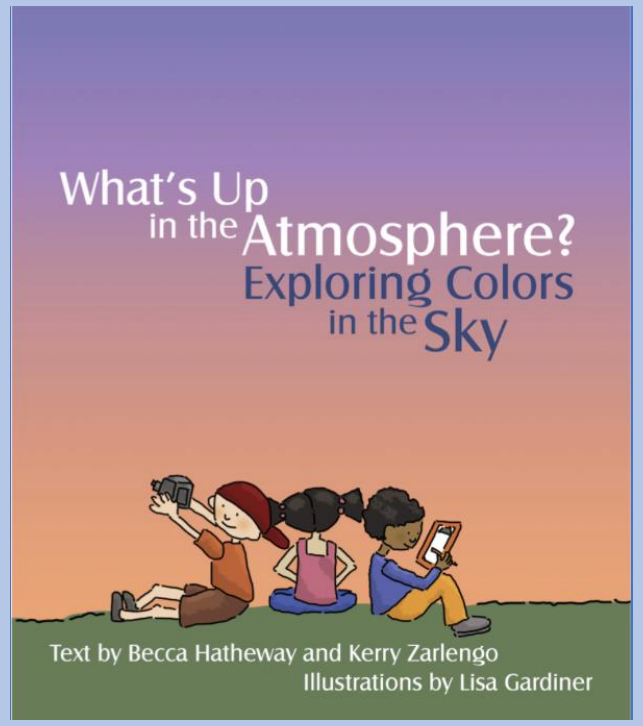
Elementary GLOBE

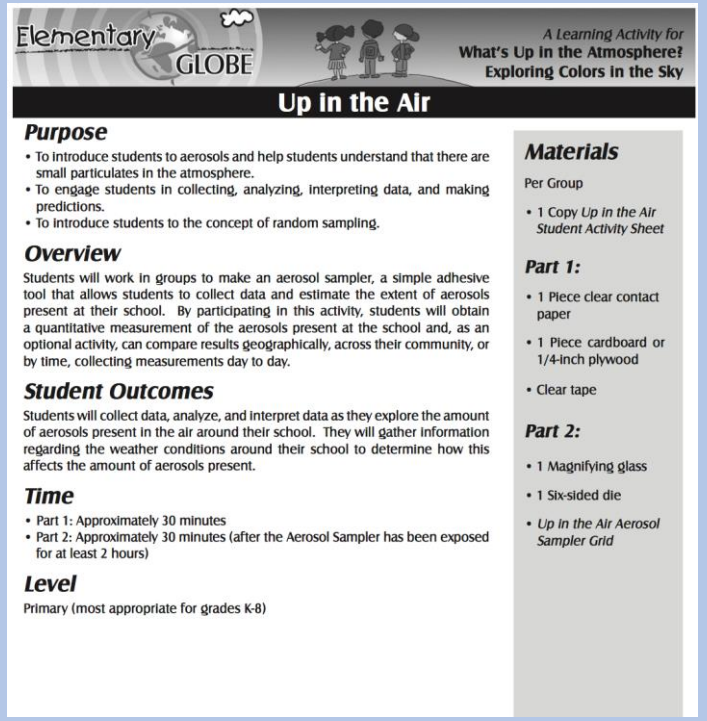


What's Up in the Atmosphere?

&

Up in the Air Activity

A mini-tutorial
by
Sara Mierzwiak



Elementary GLOBE

A Learning Activity for
What's Up in the Atmosphere? Exploring Colors in the Sky

Up in the Air

Purpose

- To introduce students to aerosols and help students understand that there are small particulates in the atmosphere.
- To engage students in collecting, analyzing, interpreting data, and making predictions.
- To introduce students to the concept of random sampling.

Overview

Students will work in groups to make an aerosol sampler, a simple adhesive tool that allows students to collect data and estimate the extent of aerosols present at their school. By participating in this activity, students will obtain a quantitative measurement of the aerosols present at the school and, as an optional activity, can compare results geographically, across their community, or by time, collecting measurements day to day.

Student Outcomes

Students will collect data, analyze, and interpret data as they explore the amount of aerosols present in the air around their school. They will gather information regarding the weather conditions around their school to determine how this affects the amount of aerosols present.

Time

- Part 1: Approximately 30 minutes
- Part 2: Approximately 30 minutes (after the Aerosol Sampler has been exposed for at least 2 hours)

Level

Primary (most appropriate for grades K-8)

Materials

Per Group

- 1 Copy *Up in the Air Student Activity Sheet*

Part 1:

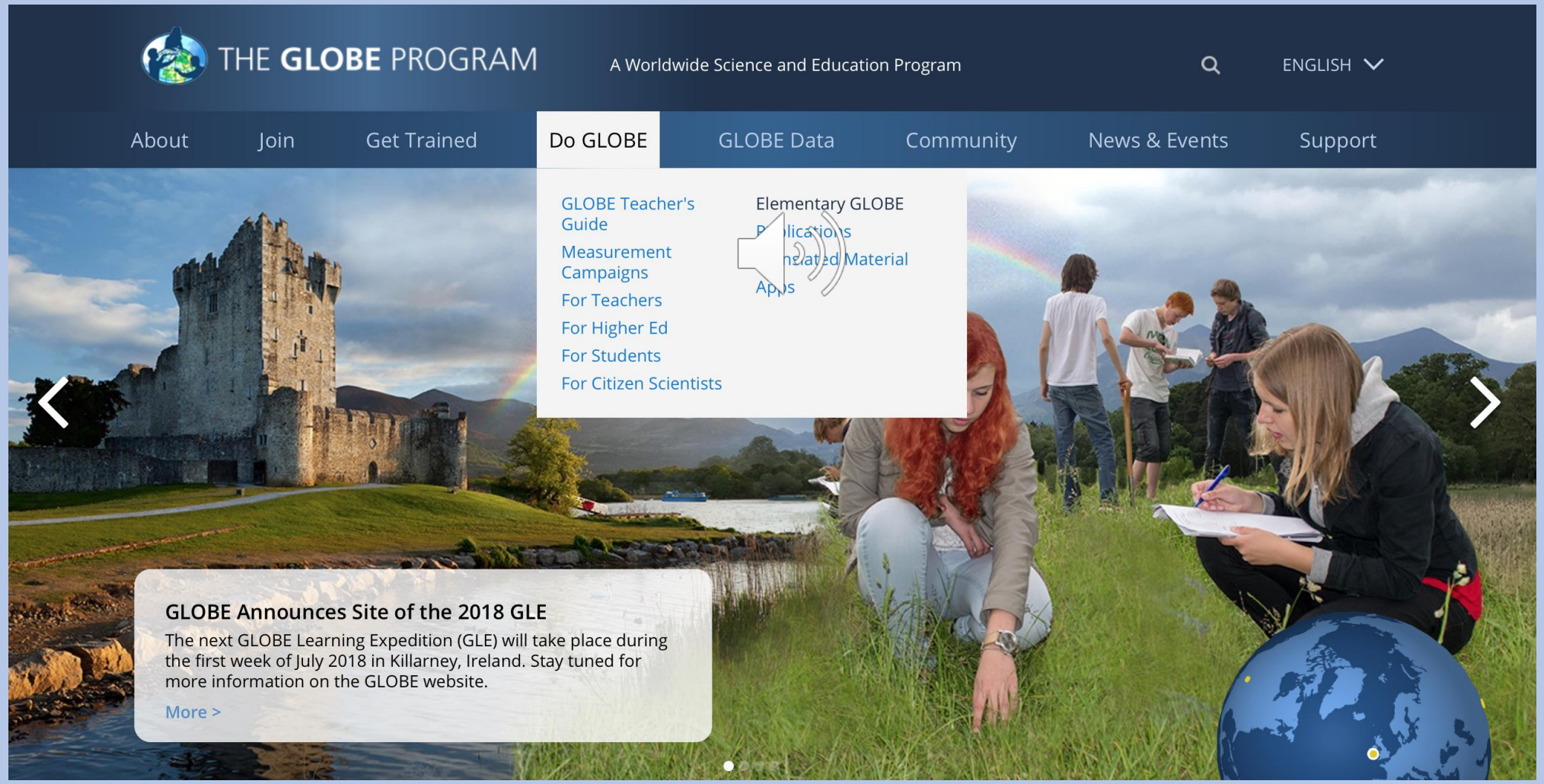
- 1 Piece clear contact paper
- 1 Piece cardboard or 1/4-inch plywood
- Clear tape

Part 2:

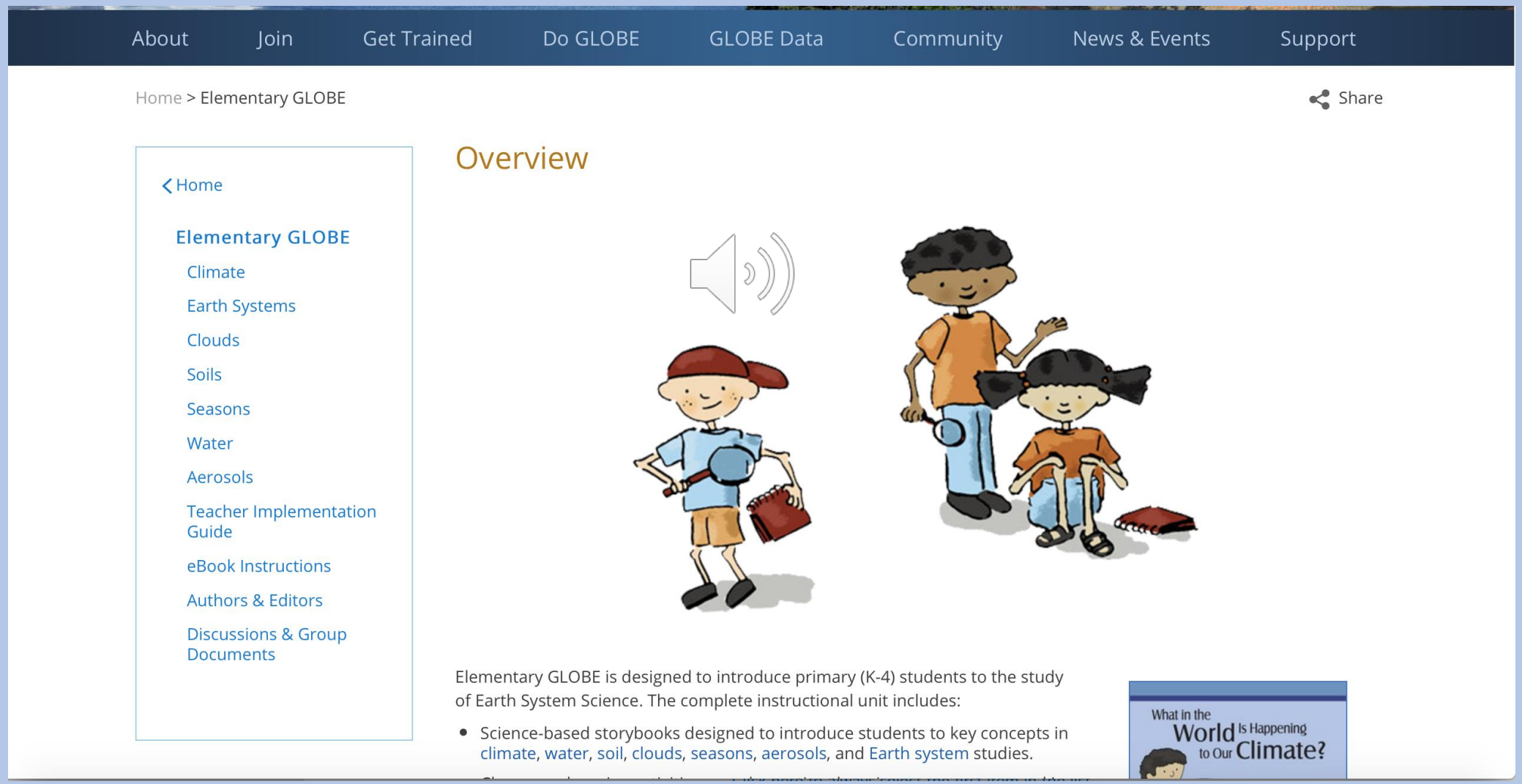
- 1 Magnifying glass
- 1 Six-sided die
- *Up in the Air Aerosol Sampler Grid*

How do I find Elementary GLOBE?

On the GLOBE homepage (www.globe.gov), go to Do GLOBE → Elementary GLOBE



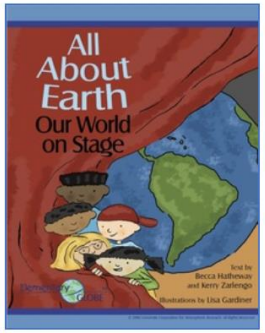
On the Elementary GLOBE page, you'll find everything you need for K-5 GLOBE Activities

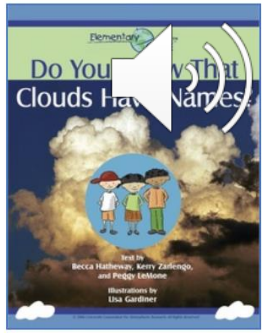


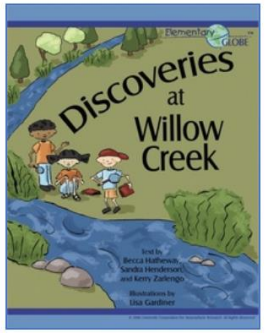
Scroll down for the storybooks…

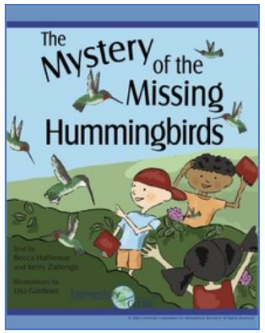
you would like to assist us in adding your language to this list please contact us at help@globe.gov.

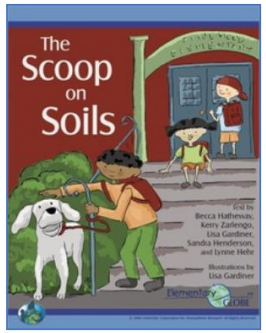
Check out our latest Elementary GLOBE book:"What in the World is Happening to Our Climate?" For more books from Elementary GLOBE, click on the images below.

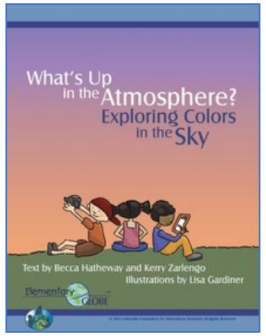












Here you can download the “What’s Up in the Atmosphere” storybook

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Learning Activities

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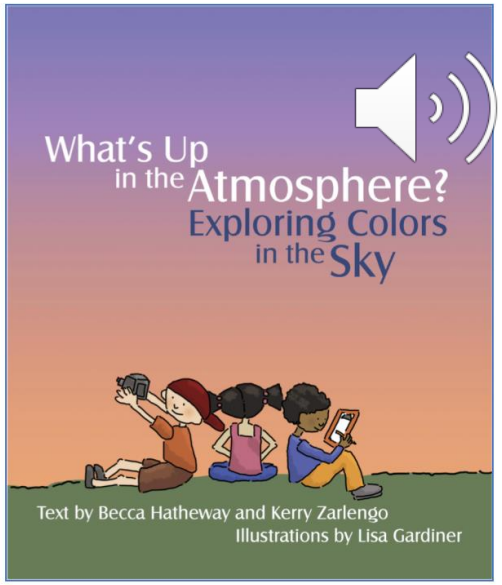
Aerosols Storybook



What color is the sky today? Anita, Simon, and Dennis want to know why the sky isn't always blue. They learn that there's a lot more than air in the atmosphere, which can affect the colors we see in the sky.

Download the Aerosols storybook and learning activities! All files require the free Adobe Acrobat Reader.

Click here to access the NGSS Alignment of the storybook and learning activities.

Language	Print
English	21.4MB
Français	24.2MB

Download eBook	49.1MB
Instructions for eBook	Instructions

Learning Activities

Elementary GLOBE

Aerosols

Storybook

Learning Activities

Printing Tips

Aerosols Learning Activities

Sky Observers

Students will make observations of the sky, record their findings and share their observation reports with their peers. The purpose if the activity is to engage students in active observation and recording skills; and to help students observe sky color, recognize that sky color changes.

Download: English

View webstory, *Become an Atmosphere Observer*: http://science-edu.larc.nasa.gov/skycolor/

Download *Become an Atmosphere Observer*: English

Why (Not) So Blue?

Students [illegible] have a prediction about how drops of milk will affect color and visibility in cups of water representing the atmosphere. The purpose of the activity is to help students understand that aerosols in the atmosphere have an effect on sky conditions, including sky color and visibility; and to provide students the opportunity to become more familiar with the classification categories for daytime sky color and visibility.

Download: English

See the Light

Students will use prisms and glue sticks to explore the properties of light. The purpose of the activity to demonstrate that white light is made up of seven colors that represent different wavelengths; and to illustrate why the sky is blue during the day and red at sunset.

Download: English

Up in the Air

Students will work in groups to make an aerosol sampler, a simple adhesive tool that allows students to collect data and estimate the extent of aerosols present at their school. The purpose of the activity is to introduce students to aerosols and help students understand that there are small particulates in the atmosphere; to engage students in collecting, analyzing, interpreting data, and making predictions; and to introduce students to the concept of random sampling.

Download: English

Up in the Air Activity - AKA “Sticky Grid”

Up in the Air

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Download: English

Elementary GLOBE

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Materials

Per Group

- 1 Copy *Up in the Air Student Activity Sheet*

Part 1:

- 1 Piece clear contact paper
- 1 Piece cardboard or 1/4-inch plywood
- Clear tape

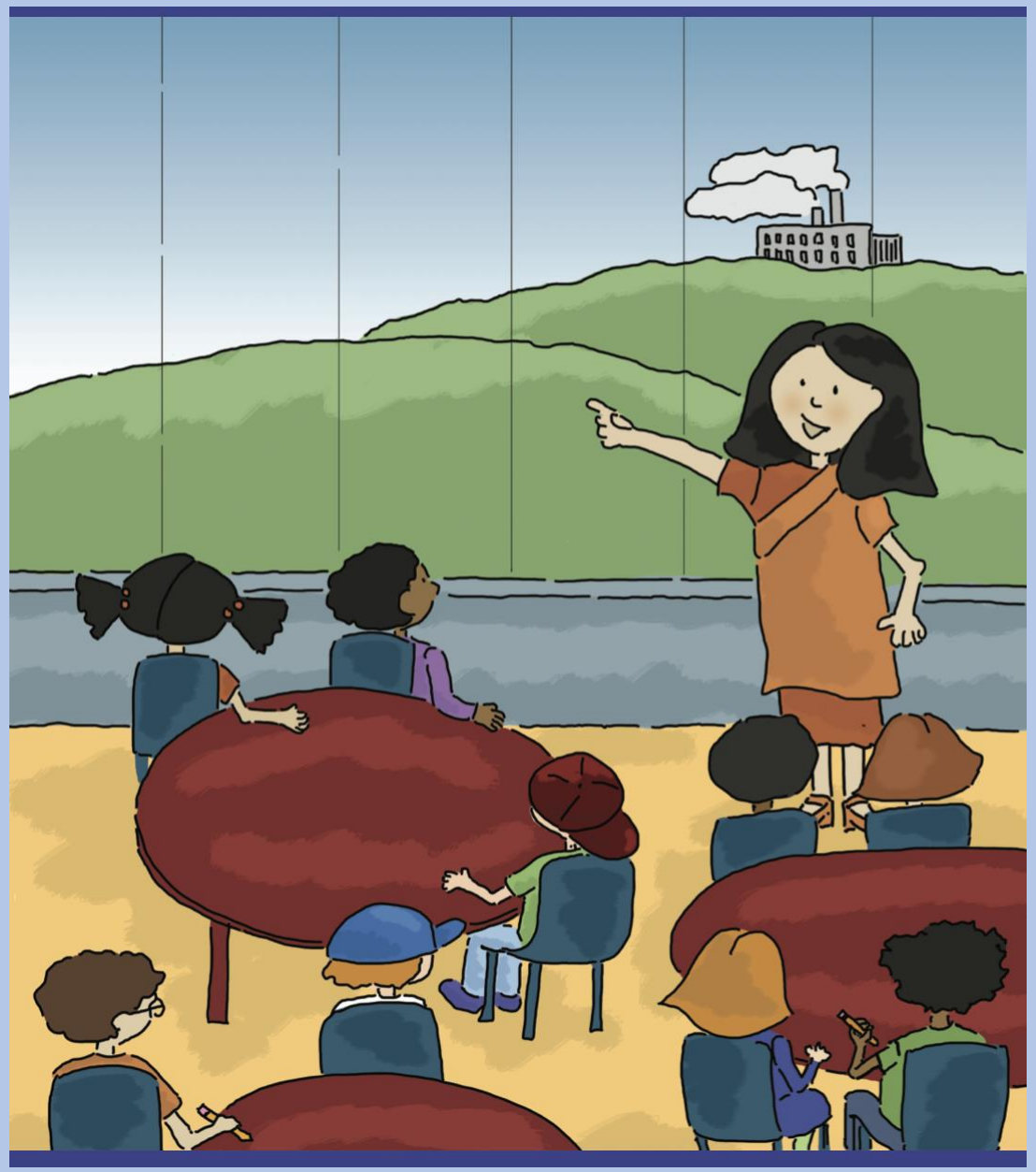
Part 2:

- 1 Magnifying glass

https://www.globe.gov/documents/348830/dfa64dca-3452-4d2b-8016-167812fbf230

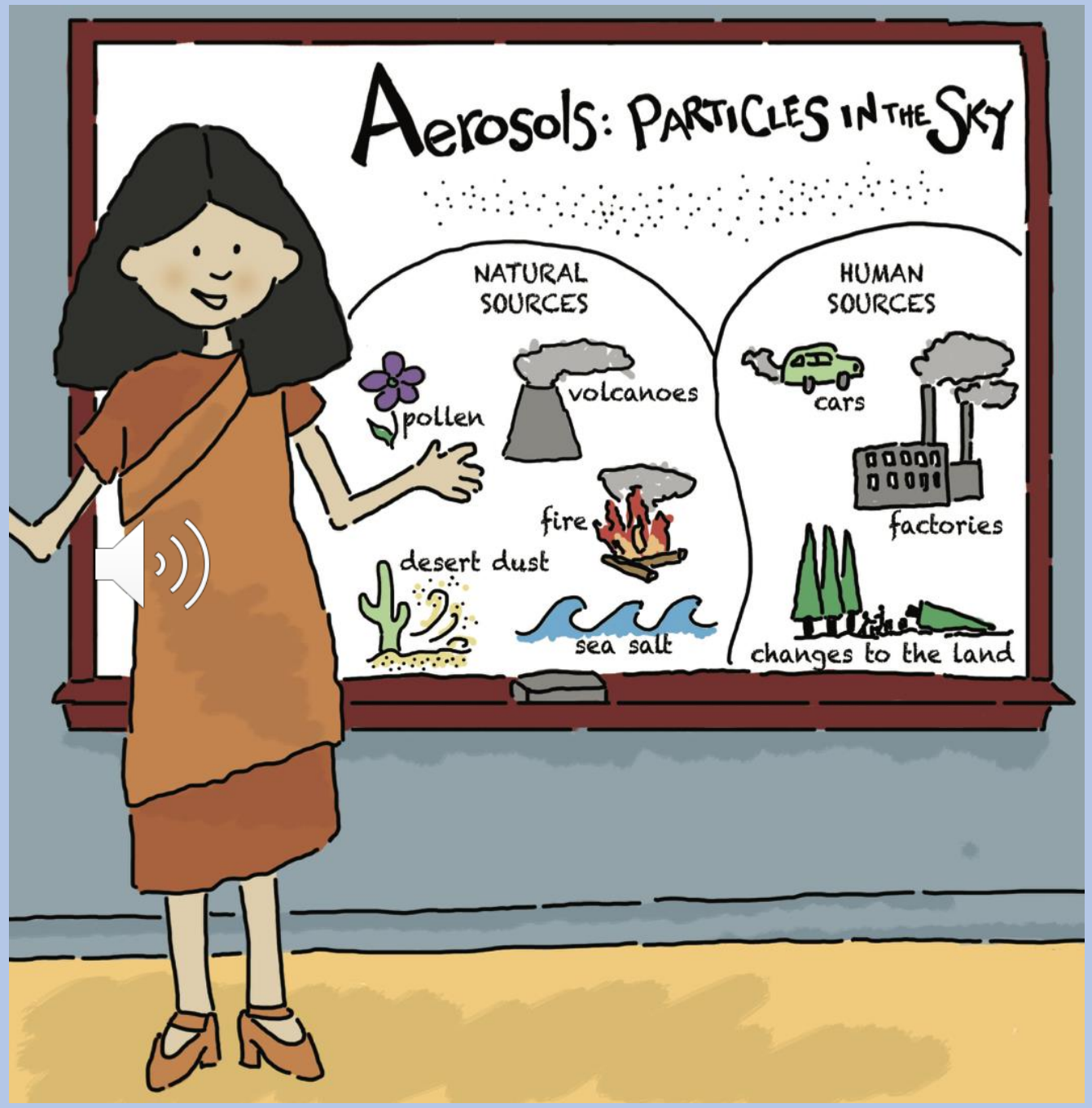
Introduce the Activity

- Divide the class into multiple research groups.
- Ask the students to describe what they see in the sky. Ask students if they have ever noticed small particles in the sky. Some aerosols are too small for our eyes to see, but other aerosols are larger such as dust or ash.
- Tell your students that today they are going to collect data on the amount of aerosols around their school.

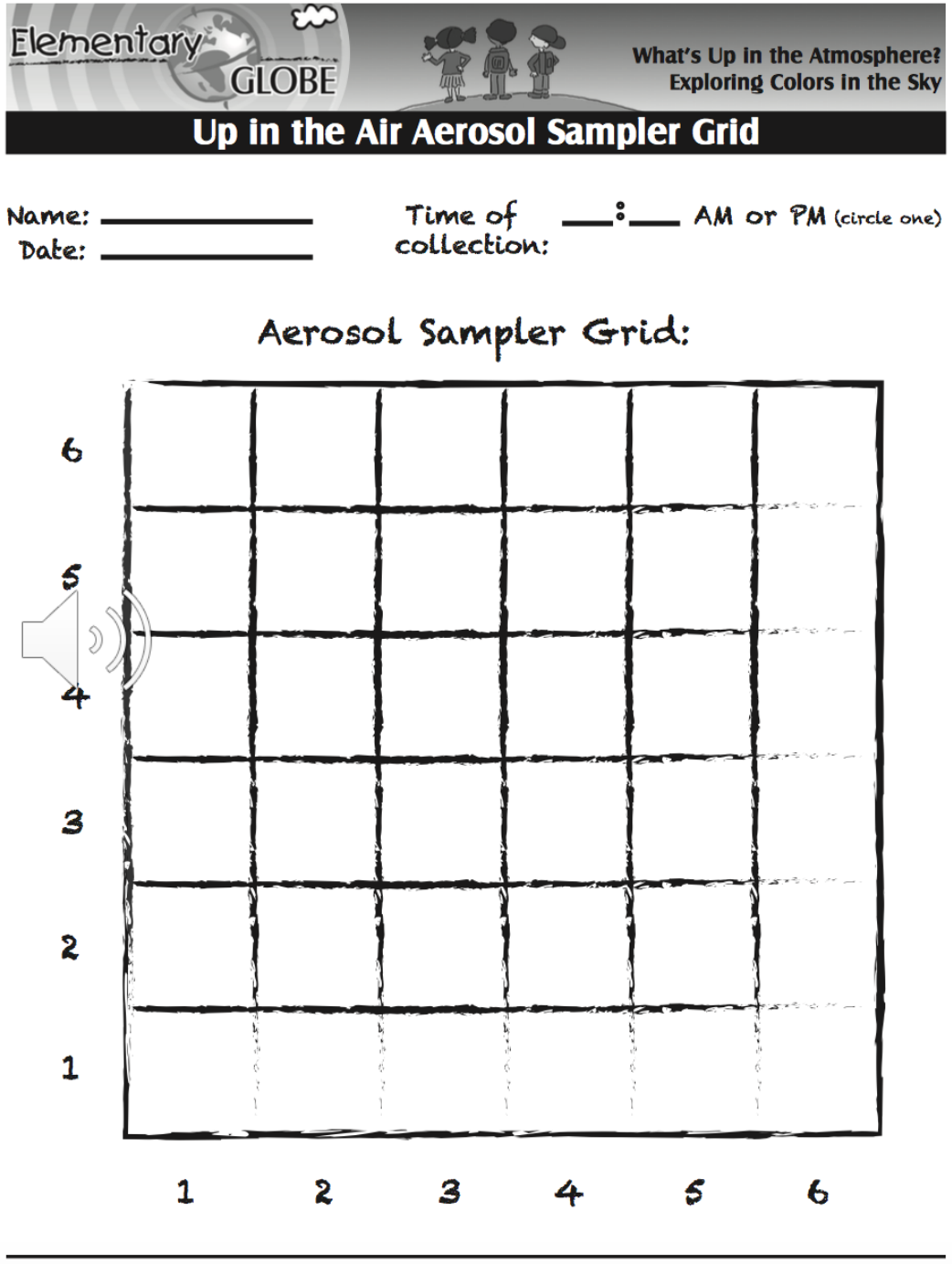


Talk about Aerosols

- Tell students that Aerosols can come from many different sources
- These can include Natural Sources such as volcanoes and fires, and Human Sources such as from factories and cars.



Adhere the Aerosol Sampler Grid to a square piece of cardboard, then cover it with sticky paper.



Elementary GLOBE

What's Up in the Atmosphere?
Exploring Colors in the Sky

Up in the Air Aerosol Sampler Grid

Name: _____ Time of collection: ___:___ AM or PM (circle one)

Date: _____

Aerosol Sampler Grid:

6
5
4
3
2
1

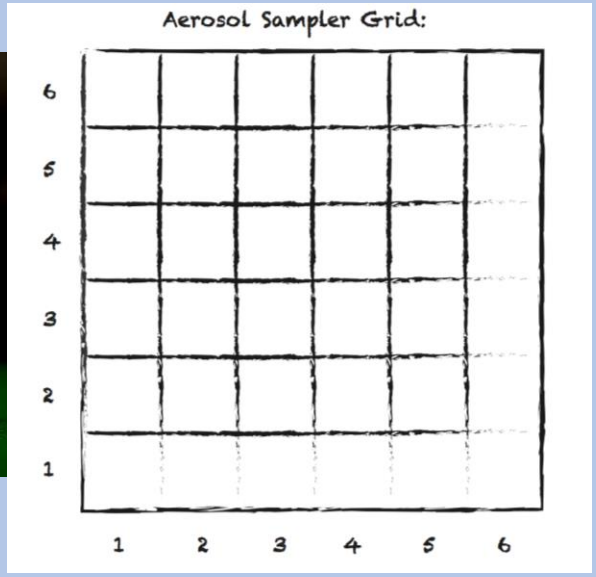
1 2 3 4 5 6

Set the Aerosols Sampling Grids outside

Place the Sticky Grids in various locations around the school grounds.

Part 2: Collect Aerosol Samples and Analyze

1. After at least 2 hours, go back outside and collect the sampler. (If the Aerosol Sampler is left outside for longer periods of time, students may want to collect weather data at the collection time as well for comparison.) Place the *Aerosol Sampler Grid*, grid side down, over the collecting surface and return the sampler to the classroom.
2. Remove the sampler from the cardboard and observe the aerosols from the back side of the clear contact paper (grid should be showing through).
3. Using the magnifying glass or holding the contact paper up to a light (i.e., an overhead projector), count the number of aerosols found in each of 10 randomly selected squares on the *Aerosol Sampler Grid*. Randomly select the squares by tossing one die twice. For example, if the numbers come up 2 and 5, the square is found in the second column, fifth row.



4. Record the number of aerosols in each sample square. Add up all the aerosols in the 10 randomly selected squares to get a total. Next, divide the total number of aerosols counted by 10 to get an average or mean number per square.
5. Compare results of each student group.

Students record their data on the

Up in the Air Student Activity Sheet

Elementary GLOBE

What's Up in the Atmosphere?
Exploring Colors in the Sky

Up in the Air Student Activity Sheet

Name: _____ Time: ___:___ AM or PM (circle one)

Date: _____

Are there clouds?
- ☐ no clouds
- ☐ some clouds
- ☐ lots of clouds
- ☐ fog

Is there precipitation?
- ☐ none
- ☐ rain
- ☐ sleet
- ☐ snow

Is there wind?
- ☐ gentle wind
- ☐ strong wind
- ☐ no wind

Visibility:
- ☐ very clear
- ☐ clear
- ☐ somewhat hazy
- ☐ very hazy
- ☐ extremely hazy

Temperature:
- ☐ cold
- ☐ chilly
- ☐ comfortable
- ☐ warm
- ☐ hot

Weather data was collected:
- ☐ when the sampler was put outside
- ☐ when the sampler was collected

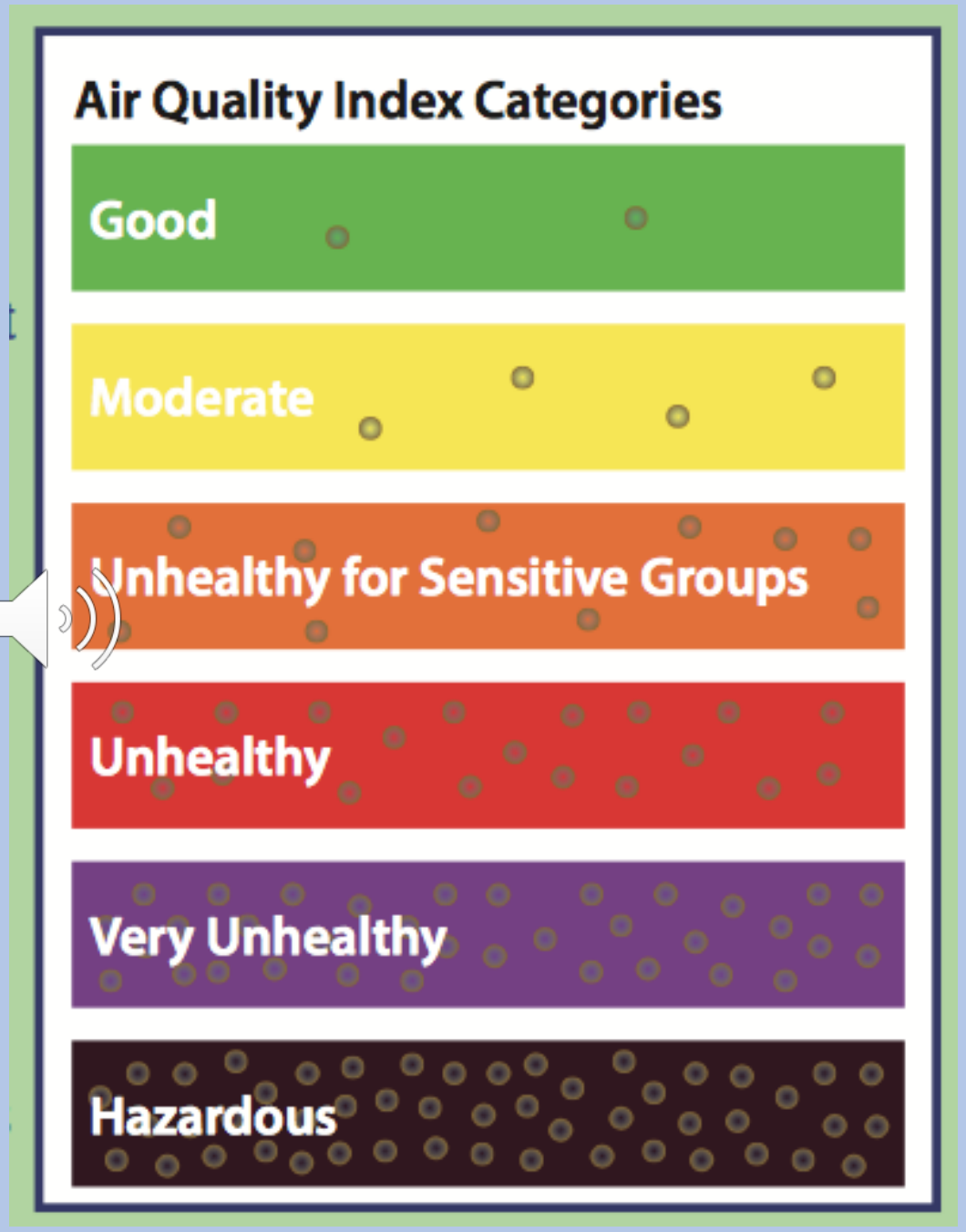
Aerosol Sample Analysis (8–10 Random Squares):

	# Aerosols
Sample Square 1	
Sample Square 2	
Sample Square 3	
Sample Square 4	
Sample Square 5	
Sample Square 6	
Sample Square 7	
Sample Square 8	
Sample Square 9	
Sample Square 10	
Total (add Squares 1–10)	
Average (divide total by 10)	

Talk about your Results

- Have the students share out their results.
- Discuss which locations had the highest numbers of aerosols, and why?
- And which locations had the lowest numbers and why?
- Ask: Did weather play a role in their results?

Discuss Aerosols and Air Quality



Credits

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What's Up in the Atmosphere Storybook prepared by →

The GLOBE Program is a hands-on international education and science program that joins students, educators, and scientists from around the world in studying Earth system science (ESS). The core objectives of GLOBE are to improve science education, enhance environmental awareness, and increase understanding of Earth as a system. For more information, please visit www.globe.gov.

Elementary GLOBE is designed to introduce K-4 students to the study of Earth system science (ESS). Elementary GLOBE forms an instructional unit that comprises multiple modules that address ESS and interrelated subjects including aerosols, seasons, soils, water, and weather. Each Elementary GLOBE module contains a science-based storybook, classroom learning activities that complement the science content covered in each book, and teacher's notes. The storybooks explore a component of the Earth system and the associated classroom learning activities provide students with a meaningful introduction to technology, a basic understanding of the methods of inquiry, and connections to mathematics and literacy skills. For more information, please visit www.globe.gov/elementaryglobe.

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