The following are two general activities taken from the GLOBE web site. Try these to the point that you can, adapting as necessary. For example, if your country is not yet a partner nation, you may not be able to get a Landsat Thematic Mapper scene of the study site, but your students can still discuss their observations of the area chosen. The discussions that you generate will be insightful and full of language learning opportunities—vocabulary building, sentence structure for description (e.g., word order), and skills building.

Our Home Planet: The Global View

Purpose

To introduce the GLOBE program to students and to provide them with an overview of the GLOBE's most significant features

Overview

Students look at globes, maps, and astronauts' photos of Earth, and consider the Earth system as a whole. They are then introduced to the key elements of the GLOBE program: the scientists, the study areas, and the international community of students.

Time

One class period

Key Concepts

- Earth is a planet, functioning as a whole, with interconnected systems.
- The scientific community works together to gain a deeper understanding of Earth's interconnections.
- Students and teachers can be part of this community through their participation in the GLOBE program.

Skills

- Reflecting on the whole, in this case on the entire planet
- Hypothesizing about the future of the planet
- Brainstorming and reflecting upon the role of good data in scientific investigations

Levels

All

Materials and Tools

- The GLOBE whole Earth poster, photos of Earth from space taken by the astronauts, and as many other images of the Earth as you can find. You might include a globe, an atlas, maps, and any other representations that will stimulate your students' thinking about their planet.
- Welcome letter to students (from Preface)

Preparation

None

Prerequisites

None

Background

Students today are fortunate to grow up with pictures of the whole Earth as seen from space—beautiful, blue, vulnerable, and rich in mysteries. We all profit from those brave early explorers of space who not only traveled into the unknown, but sent back pictures and words filled with their impressions of the Earth seen from afar. The very thinness of the atmosphere took the astronauts' breath away, while the Earth's color and complexity stood in sharp contrast with the gray and lifeless surface of the moon.

To be better caretakers of the planet, we need much more information about how our Earth system works. In GLOBE, our students gather critical data which help scientists understand the myriad interconnections among the land, water, and air of Planet Earth.

What to Do and How to Do It

Step 1: View Earth from space.

Place the Earth images in prominent positions about the classroom.

Give the students several minutes to observe the globe, posters, and images of the whole Earth seen from space. Invite students to share their responses to the images of Earth. There are no right or wrong answers; any response is acceptable. Encourage your students to point out the Earth's outstanding physical features, to identify geographic areas with significantly different features, and in general to think globally. Ask them to consider what might be evidence of life in the image. Could anything that happens in another part of the world affect what happens in your part of the world?

Step 2: Who do you know elsewhere in the world?

Select a globe or map you can mark with small notes or push-pins. Ask your students who they know (friend or family) who lives outside of their own community. Ask your students to consider what they might learn from these people about their parts of the world. Is it warmer or colder in their area? Is there more rainfall? Heavier rainfall? Snow? Is the soil more sandy or better for growing crops? Is the rain and water more or less acidic than your own? Such a discussion will develop in students a sense of the value of each person's data. Point out that they will soon become experts in their own study sites and will contribute that information to the world community.

Step 3: Brainstorm with your students.

What could we learn about the Earth with data from students around the world?

We could learn more about the following:

Mississippi River Delta

• *How is Earth able to support life?*

Beginning and intermediate students might mention the Earth's atmosphere, its water, and other critical but single, specific features.

Advanced students might mention the way the planetary systems of water, soil, and air work together, or the way organisms and the planet have evolved together.

• *What challenges are faced by the Earth?*

Beginning and intermediate students might mention single examples of human impact or particular pollution problems such as oil spills or acid rain. They might simply say that we should study it.

Advanced students might note the population explosion and atmospheric changes. They might point out that, working together, we should study these changes over time in different parts of the world, sharing our findings.

• *What might the world be like 50 and 100 years into the future?*

Our Special Place: The Local View

Purpose

To give students their first experience to observe their GLOBE Study Site, using their senses to obtain a holistic, motivating impression of the study site

Overview

Students go outside and make both large-scale and small-scale observations of a potion of their GLOBE Study Site. After a period of reflection, they transform those observations into representations—sketches, stories, or poems. Students compare their area with that of other classmates and consider what might explain any differences in the two areas. Students also begin to use their GLOBE Science Notebooks.

Time

One class period

Levels

All

Key Concepts

- A study site is an organic whole.
- The natural world is a rich source of information. You can use your senses to gather important information.

Skills

- Increasing awareness of one's own environment
- Describing, recording, and creating a representation based on observation

Materials and Tools

- A variety of art materials
- Student notebooks to use as GLOBE Science Notebooks.

Preparation

Select a representative nearby location within your GLOBE Study Site.

Make travel arrangements, if they are needed.

If you have not already done so, create a GLOBE bulletin board area in your school or class. Eventually your students will post a wide range of information on the bulletin board. For this exercise, your students will post their drawings, poems, and stories.

Prerequisites

This is best done after the Welcome to GLOBE activity.

Background

Each school in the GLOBE program conducts its observations and measurements in a designated study site. This GLOBE Study Site is a 15 km x 15 km region centered on your school and provides the broad context within which specific study sites are designated for the *atmosphere, hydrology, soil,* and *land cover/biology investigations.*

In this activity, your students will explore their GLOBE Study Site with their senses before they begin making multiple measurements. If they start with observing the whole, then they will retain a sense of this larger context within which the parts fit. Furthermore, accurate observation depends on the use of all their senses, not just their eyes. This is particularly true when observing a living ecosystem.

This activity has three phases: an observation phase, a reflective phase, and a representation phase. During the observation phase, students quickly and spontaneously record anything and everything they observe within the study site. The observations and recording are done in a stream-of-consciousness fashion to help focus attention on the observable and heighten awareness. During the reflection phase, each student reviews his or her collection of observations and considers how the observations relate to one another. During the representation phase, students create a representation of their site or some aspect of it. This can take many forms—a poem, a detailed drawing, a story. This phase brings together each individual's observations and reflections.

This kind of initial contact with the environment strengthens the student's motivation to learn. With their lively multimodal sensibility intact, students will observe more keenly, care more deeply, and think more broadly about the particular site. They will then be more committed to subsequent GLOBE protocols and investigations. You might want to repeat

this holistic observation periodically and give the students an opportunity to see how their own perceptions grow in depth and breadth.

Selecting Your GLOBE Study Site

Initial considerations

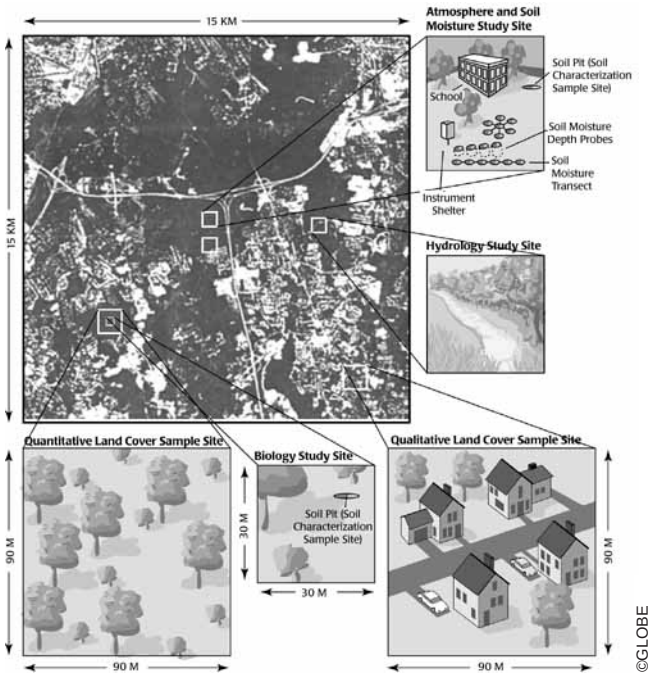
The selection of the local study and sample sites can be an opportunity to begin an inventory of the area around the school and to discuss criteria for selecting measurement sites. What is a good place to measure water temperature, and why? What do you have to consider when planning where to dig a soil profile? Where can you get representative samples of soil moisture, and what might influence the choice of sampling strategy? How can my Landsat imagery help me with these decisions? These are only a few of the multiple questions that can serve as catalysts for learning.

For each measurement site within your GLOBE Study Site, there will be hard choices to make because no one will have a perfect set of locations. This is an opportunity to work on solving problems with your students in order to come up with the best arrangement for your class, your school, and your schedule. We suggest you try to come up with several candidates for site selection and have your students be active participants in the selection process.

GLOBE Study Site

Your GLOBE Study Site is the 15 km x 15 km area centered on your school. All of the smaller study sites are located within this large GLOBE Study Site. GLOBE, working with the country coordinators, will provide a Landsat Thematic Mapper scene of this area. From an instructional standpoint, the goal of these sites is giving your students a feel for the physical resolution of satellite images as well as providing a suitable and convenient area upon which to focus student measurement activities.

Within your 15 km x 15 km GLOBE Study Site, you will select several specific study sites, corresponding to the individual protocols: atmosphere, hydrology, soil moisture, and land cover/biology as detailed below. Once established, these study sites are locations to which students will return again and again to take measurements. The land cover and soil characterization protocols involve measurements that are done only once at specific locations, which are referred to as sample sites.



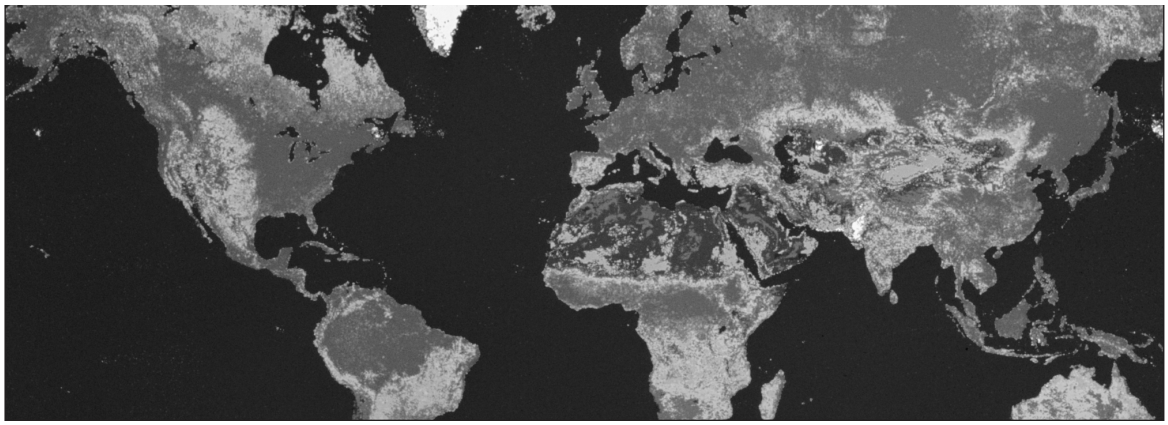
What to Do and How to Do It

1. Ask each student to select a place within the GLOBE Study Site. This will be their "special place." Ask students to do some of the following exercises. Read each section aloud, asking students first to observe, then to reflect, and then to write or draw in their GLOBE Science Notebooks. Pause between questions for several minutes to give your students the appropriate amount of time to observe, reflect, and respond.

Have your students do the following:

Observation phase

2. Sit quietly in your site, experiencing and observing it. Use your senses—your eyes, your ears, your nose—to explore the site. What do you see? What do you hear? What do you smell? What do you feel?



3. Observe the "big picture" about your special place, looking both high enough to include the sky and low enough to see the ground. What are the biggest features you notice?

4. Observe the "small picture" in some detail, the area immediately around you. What do you notice?

Reflection phase

5. Think back over your experience. What strikes you most strongly about your observation?

6. How much of what you saw, heard, or smelled is man-made? How much is natural? What do you find beautiful? What unattractive? What questions do you have?

Representation phase

7. Sketch a picture, poem, or story about your place. Include your feelings about it as well as what you have seen and learned.

When the class returns to the school, have students share their observations, sketches, and writing. Post some of them on the school's GLOBE bulletin board.

Extensions

- Create individual and classroom reproductions of the site or part of the site, in a variety of media: photographic essay, set of drawings or paintings, GLOBE Science Notebook with specimens, mural, diorama, Hypercard presentation, video, storybook, and so forth. Try to include something about each individual's special site.
- A second field trip could feature comparing one site with another. Students could consider what further exploration might help them learn more about their special places.
- Research your study site's geological, historical, and legal characteristics. Look at old topographic maps. How might this site have looked five years ago? A hundred years ago? Ten thousand years ago? Describe any changes you think may have occurred during these time spans. Use both words and images to describe these changes. Survey neighbors for tales of the history of your study site.
- Explore the idea that the site may change again. What changes are most likely? Illustrate more than one scenario for what changes may take place during the current year, next year, in 10 years, and in 100 years.

Student assessment

Have each student create a portfolio of seasonal observations for each site. Then compare and contrast the observations, looking for enhanced understanding. Ask each student to comment on what he or she has learned since the first observation, in contrast with the later observation. (This can tie in with the seasons investigation, which takes place after your students have begun collecting and submitting GLOBE data.)

Acknowledgment: This activity was inspired in part by TERC's Global Lab Project, *Selecting and Experiencing*.

GET CONNECTED

We encourage you to try the GLOBE program. You can become part of the GLOBE network by going to the web site <http://www.globe.gov> and registering. Even if you cannot participate fully, you will find some interesting material for your classes on the web pages.