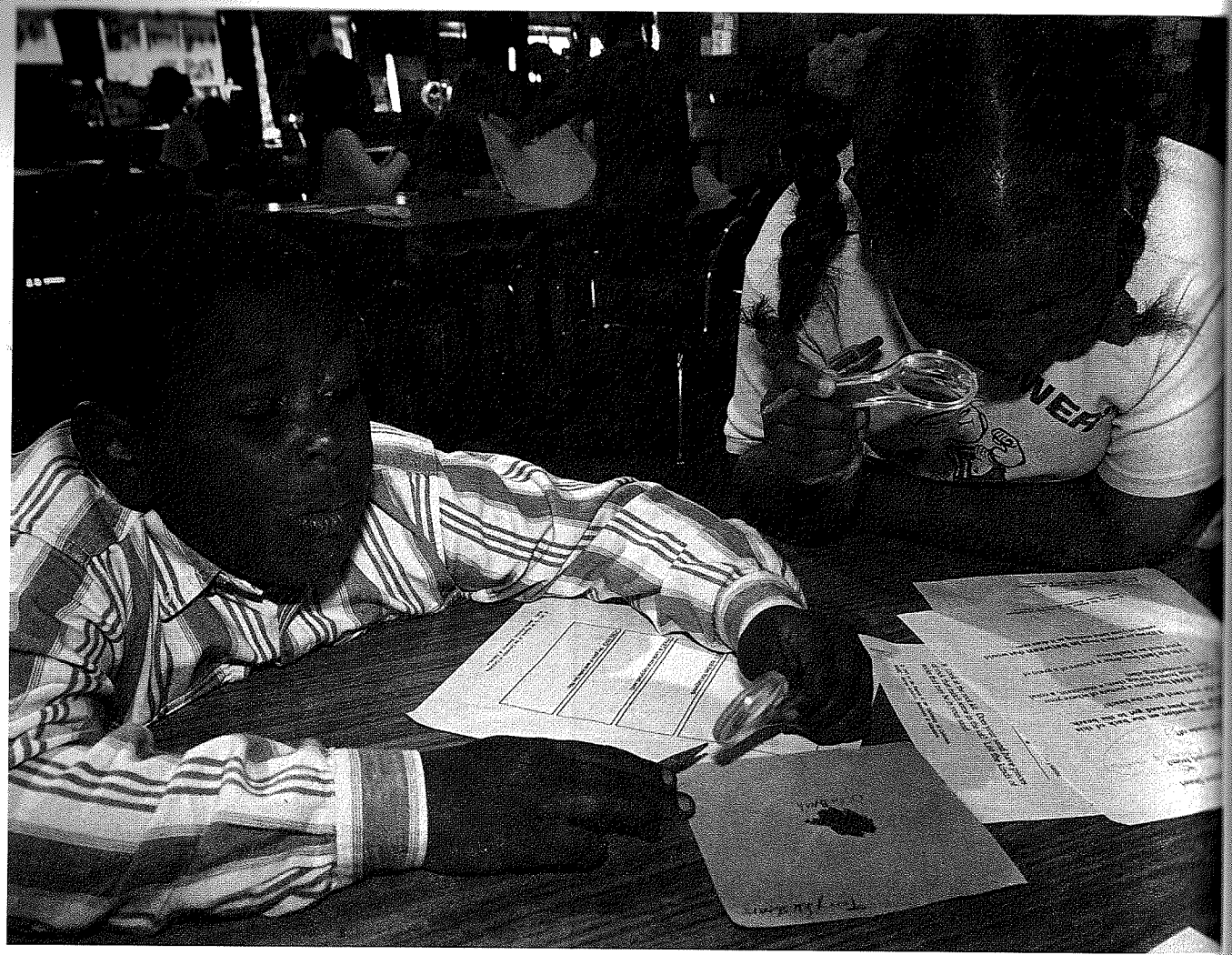


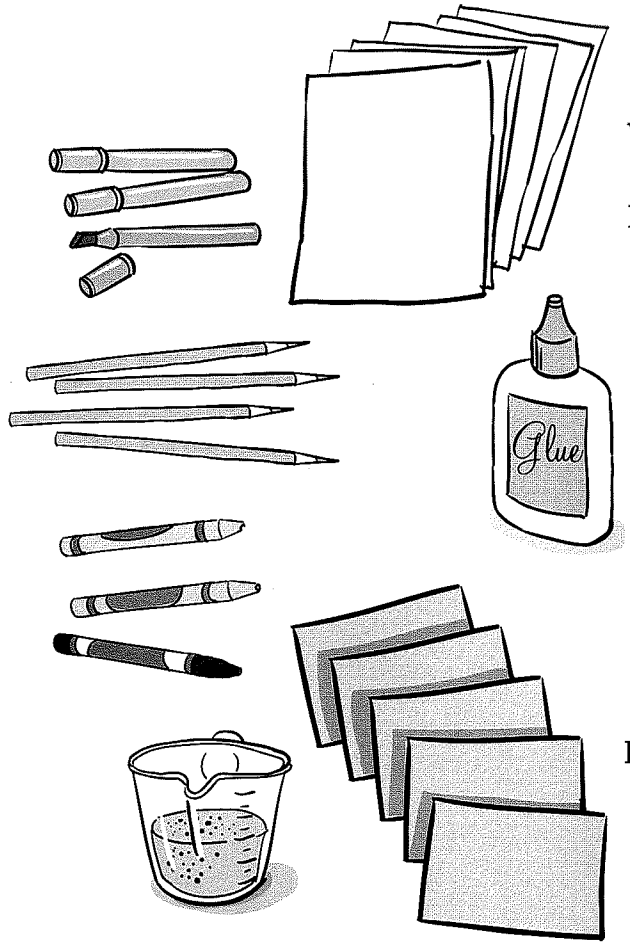
Activity 2: Sand on Stage

Overview

Nearly all solid materials in the world, both living and non-living, will eventually be eroded into sand. Mountains, rocks, minerals, shells, corals, bones, metals, and glass are all worn down over time by wind, waves, rivers, earthquakes, and other forces into smaller and smaller particles. Thousands or millions of years may pass as a rocky outcropping on a mountain top is transformed into a grain of sand on a sandy beach.

In this activity, small groups of students use hand lenses (or low-powered microscopes, if available) to compare the color, size, and shape of several sand samples and to guess about their origins. Students discover that sand grains can be made of animals, plants, rocks, or minerals. Sand grains come in many different shapes, sizes, and colors. These differences can be clues about where the sand came from and how it got to the beach.

In Session 1, Partner Parade, students get "**Into** the Activities" by working with partners to discuss and write about sand. They record their knowledge and any questions they may have on their own charts, then contribute their ideas for a class "Anticipatory Chart." In Sessions 2, 3, and 4, students go "**Through** the Activities." They compare different types of sand, observe sand with hand lenses or microscopes, and record their findings on a student sheet. Then they complete the Expert Group student sheet and draw a picture of the beach where the sand they examined might have been found. A number of "Going Further" activities are suggested for going "**Beyond** the Activities."



What You Need

For the class:

- ❑ pictures of sandy beaches and beach organisms from various parts of the world
- ❑ 4–6 sheets of chart paper (approximately 27" x 34")
- ❑ markers (4–5 colors, wide tip)
- ❑ 1 small flat tray, box lid, or shoe box (for teacher demonstration of Sand in the Wind)*
- ❑ (*optional*) 1 large piece of construction paper or 1 paper plate for Sand Display
- ❑ (*optional*) white glue
- ❑ (*optional*) masking tape
- ❑ (*optional—but highly recommended*) 1–6 student-friendly microscopes (See the "Resources" section for information about where to obtain.)

For each group of 6 students:

- ❑ $^1/_2$ cup of sand, any kind (for Sand in the Wind)
- ❑ 1 small flat tray, box lid, or shoe box*
- ❑ $^1/_4$ cup each of 6 different sand samples, each from a different location (See the "Getting Ready" and "Resources" sections for information about where to obtain.)
- ❑ 1 large ziplock freezer bag
- ❑ 6 small but sturdy ziplock freezer bags
- ❑ 3–6 hand lenses (if microscopes not used)
- ❑ 2 magnets, each in a separate thin plastic sandwich bag
- ❑ 10 3" x 5" index cards (5 white, 5 a dark color)
- ❑ white glue
- ❑ 3 sheets of paper for Anticipatory Chart
- ❑ 1 or more small rock or mineral kits (See the "Getting Ready" and "Resources" sections.)
- ❑ 2–3 sets of crayons or colored markers and pencils
- ❑ 6 each of both student sheets: Sand on Stage and Expert Group (masters on pages 40 and 42)

*At the end of Session 3, some teachers do a whole group demonstration of wind's effect on sand, rather than providing one tray for each group of six students. If you decide to do it as a demonstration, you will need only one tray for the entire class.

Getting Ready

1. Obtain rock and mineral kits: Track down existing kits in your school or order from a scientific supply house (see the "Resources" section).

2. Acquire sand. As much as several months before conducting this activity, alert students, parents, and friends that the class will be studying sand. Ask them to be on the lookout wherever they travel for samples of sand. On trips to the coast, lakes, rivers, deserts, or even playgrounds, have them collect small bags of sand. Does anyone have a friend in another state or country that can send an exotic sample? You can also put a notice on the internet about collecting samples—teachers in other locales may be interested in swapping samples with you—especially teachers who are also presenting *On Sandy Shores*! Discuss each sample as it arrives. Be sure to label each sample with: where and when it was collected, and who collected it. Alternatively, sand kits can be purchased from a number of sources (see the "Resources" section).

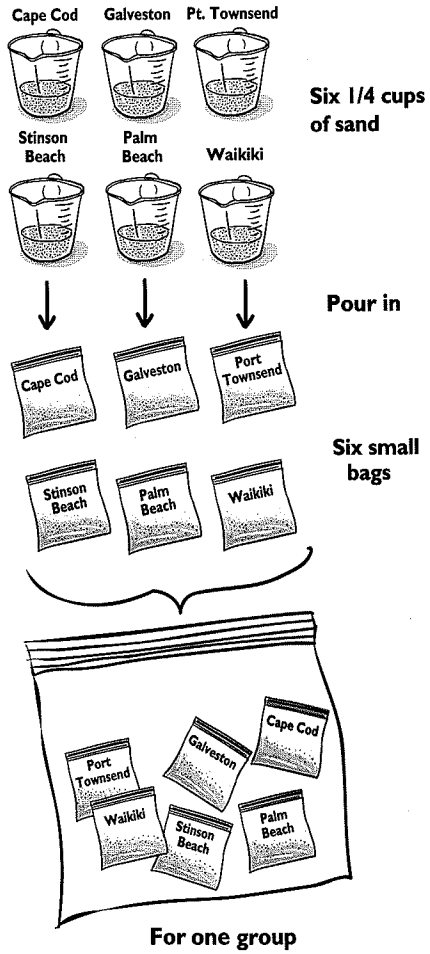
3. Organize sand samples. For each group of six students, fill six ziplock bags with a 1" layer (about $^1/_4$ cup) of sand. If possible, each small bag should have a different sand sample and all should be labeled with the location of the sand. Tightly seal each bag. Place the six samples into a large ziplock bag and seal. Each group should have the same six samples.

4. Decide if you will have all groups try blowing on the trays of sand to simulate wind, or if this will be done as a teacher demonstration with several student volunteers. If all groups will simulate the wind, place $^1/_2$ cup of sand on tray, box lid, or shoe box for each group. If this will be a teacher demonstration, then prepare one tray.

5. (*Optional*) Make a Sand Display by gluing a small amount of sand from each sample to a paper plate or construction paper. Label each sample with its location.

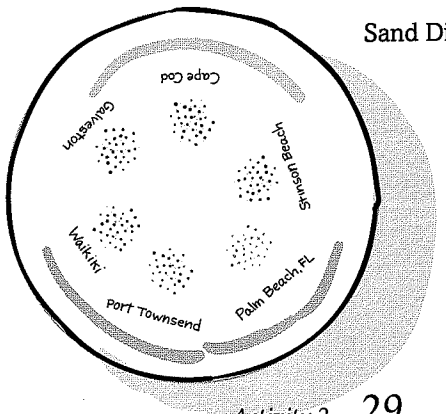
6. Obtain hand lenses or 1–6 low magnification microscopes (optional). Using microscopes will make this activity much more dramatic and fun. Grains of sand become huge boulders or easily discernible chunks of shells. Beautiful colors and the details of shapes that would otherwise be lost, are easy to see. See "Resources" for ideas on how to obtain microscopes. If microscopes are not available, hand lenses are adequate—just make sure they are not too scratched up.

If you plan to collect sand for your classroom samples, remember that only a very small amount is needed. A sandwich bag filled with sand is more than enough for years of use in your classroom. Also keep in mind that nothing, not even sand, is allowed to be collected or taken from reserves, preserves, and some National Seashores.



For one group of six students

Sand Display



7. Duplicate the Sand on Stage and Expert Group student sheets for each student (masters on pages 40 and 42).

8. Start the class Anticipatory Chart. Draw a line down the middle of the chart paper to divide it in half lengthwise. At the top of one column write "What we already know about sand." At the top of the other column, write "What we want to find out about sand."

9. *(Optional)* For Partner Parade, place two strips of masking tape on the floor parallel to each other and about an arms length apart. Make each strip long enough to accommodate half the class standing side by side on the tape.

If you're presenting these activities to younger students and/or like to have free exploration stations set up in your classroom, you may want to consider setting up a sand exploration station (as described in #1 in "Going Further" on page 38) before you present the activities.

10. Write out the Key Concepts for this activity in large, bold letters on separate sheets of chart paper and set aside.

- **Sand grains can be made of animals, plants, rocks, or minerals.**
- **Sand grains come in many different shapes, sizes, and colors.**
- **Differences between sand grains can be clues about where the sand came from and how it got to the beach.**

Session 1: Partner Parade

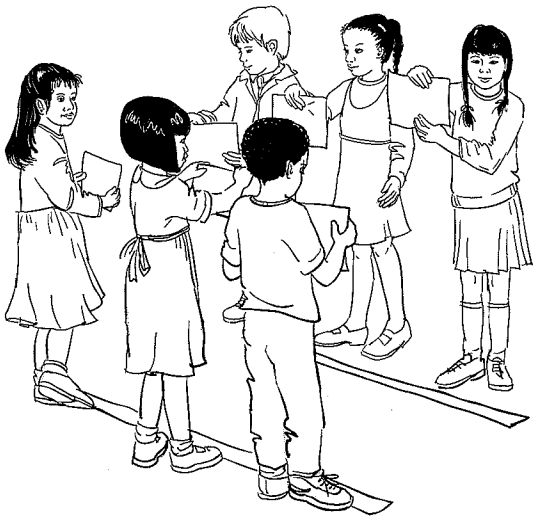
This activity structure helps students to talk and write about their related prior knowledge. It emphasizes short discussions with different partners, cooperation, and social skills development. It creates opportunities for students to use language in a non-threatening, but highly relevant setting. In Partner Parade, students build on their active listening skills by learning how to hold short interesting discussions about sand and beaches with a variety of different partners.

1. Have students recall the activity, My Buddy Says. Tell them that Partner Parade is a similar activity in which they will get a chance to talk with different classmates. Just as in My Buddy Says, they need to cooperate, follow directions, and talk quietly with each of their partners.

2. Ask the students to recall what a good listener should do [you don't interrupt, you look directly at the person] In Partner Parade, both partners will be able to discuss each question or topic. This is called having a conversation or

discussion. To have a good discussion, each partner should be a good listener and speak clearly when it's her or his turn.

3. Pass out a picture of sand or a beach to each student. Remind the students to look at the pictures closely. The pictures will help them to think about sand and to have a better discussion with their partner. Have students stand shoulder to shoulder to form two parallel lines, so that each person is facing a partner. If you have placed strips of tape on the floor have students line up along the tape. Students standing side by side should be at least six inches apart.



4. Tell the students that you will be asking a question or giving them an idea to talk about with their partner who is facing them. They will have about a minute to talk. If they can't think of anything to say, they can discuss their pictures.

5. Pose the first question from the following list for the students to discuss:

- When was the last time you visited a sandy beach? Where was it?
- What do you think of when you hear the word "sand?"
- Describe all the different places you might find sand.
- What color is sand?
- Where do you think sand comes from? What is it made of?
- How do you think sand gets to the beach?

6. Walk along the two lines to help shy or resistant partners get started. When you call time, have a few students report something that their partner told them.

7. Before the next question, tell the students that the "parade" needs to move along. Have one of the lines move one position to the left so that everyone is facing a new person; the person at the end of that line walks around to the beginning of the line. Everyone now can greet their new partner.

8. Some students may be unhappy with the new arrangement, but tell them that this activity is to help them have

At the end of the Partner Parade, you have the opportunity to divide students up into new heterogeneous groups of two, four, or six based on where they are in line. Also, if students haven't finished talking when you call time, they can tell their partner, "Unfinished Business." At the end of the activity, you can give everyone an extra minute to go back to any previous partner and "finish their business."

conversations with different people, even people they don't know very well. In a classroom, just as in a workplace, people need to be able to work together successfully with everyone, not just with a few friends. Have each student greet their new partner, then ask the next question.

9. Repeat steps 6 and 7 until you have asked all the questions.

10. At the end of the activity, ask the students to sit down with their final partner and think about some of the following questions. Then lead a brief class discussion.

- Did it seem like the whole class was cooperating?
- Did you remember to listen well to each of your partners?
- What did you learn that was new?
- Which questions were the easiest and hardest to answer?
- Did you feel comfortable doing this activity? Why?

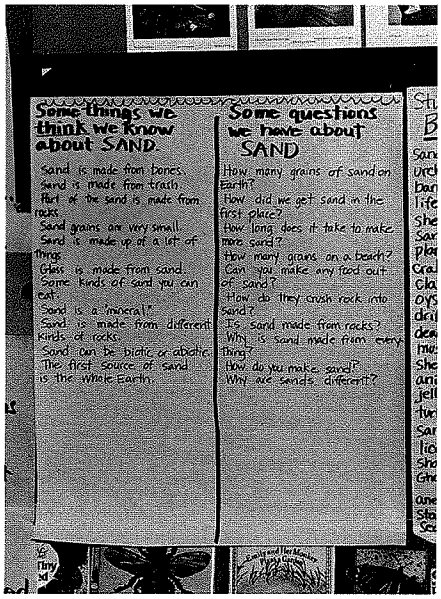
Anticipatory Chart on Sand

Making an Anticipatory Chart is another activity structure designed to help students recall information from past experiences and to assist them in clarifying what they want to learn from the activities that follow. In the Anticipatory Chart activity, students work together in pairs and have opportunities to share their ideas with the larger group.

1. Have students continue to work with their final Partner Parade partner. Show them the beginnings of the class Anticipatory Chart. Distribute paper to each pair of students and have them create their own chart.

2. If you have them, you may want to pass out a few more pictures of different beaches to each pair to give them ideas. Ask students to discuss the two questions about sand (what we know/what we want to find out) and write notes on their own chart. If there's time, each pair can share responses with another pair and discuss again.

3. When the class is ready, call them back together to share some of their best ideas and questions with the whole group. Record the group's ideas on the class Anticipatory Chart. If the same idea comes up more than once, put a



Having students record their ideas and questions on their own charts provides valuable practice organizing their thoughts in writing. It also provides the teacher with an informal pre/post survey that can become part of student portfolios. If this type of recording is not appropriate for some of your students, then verbal discussions, followed by whole group sharing, with the teacher recording on the class chart, is a fine alternative.

star next to it each time it is mentioned. Display the chart and refer back to it throughout the activity. As questions are answered, check them off and record the answers on another chart. Collect the pictures of sand, beaches, and beach organisms.

Session 2: Comparing Sands

Observing Samples

1. Divide students into groups of six. Tell the groups they will now have the opportunity to observe different types of sand from many different places.

2. Give each group the large bag containing six small bags of sand. Have each of the six students take out one small bag of sand. Tell them that for now they should not open the bag; they should make their observations by looking or feeling through the bag. They should do this **gently,** being careful not to puncture the bag! Ask, "How big are the sand grains?" "Can you tell what they're made of?" "What colors do you see?" "What do the sand grains look like?"

3. Next, have each group compare their six samples. How are they similar? How are they different?

4. Bring the whole class back together for a short discussion. What did they discover about their sand? How were the samples the same? different?

5. Ask students to imagine a clam living burrowed in the sand on a beach. How might its shell end up as sand? [It dies and waves break it up into little pieces; it gets smaller and smaller as it is jumbled in the waves with other pieces of rocks, shells, and sand.] How might a rock on a mountain top become sand? [It breaks off from the mountain top and rivers carry it to the ocean.] How about coral on a coral reef? [Parrot fish eat it and crunch it into small bits or waves gradually wear it away after the coral dies and currents bring it to shore.] Why then might there be so many different colors of sand? [Different colors indicate that the sands are made of different things such as rocks, shells, bones, coral, glass.]

Use the responses to the Partner Parade and the Anticipatory Chart to assess your students' prior knowledge. If students seem generally familiar with the topics of what sand is made of, how it is formed, and how it travels to sandy shores, you can move rather quickly through the following activities and allow students to draw further conclusions and inferences. If they do not seem to have much prior knowledge of those topics, you may have to proceed more slowly and provide more directed information.

As students respond to the question about how a rock on a mountain might become sand, you may want to introduce the word and concept of ***erosion.*** *Or you could describe the process without introducing the word itself. Erosion is defined, and featured as a Key Concept in Activity 3: The Sights that Sand has Seen.*

6. (*Optional*) Show students your Sand Display, and ask them to look at how different some types of sand can look from others. Ask students to look for sand wherever they go to add to the display.

Making Sand Slides

1. Now students get to make a "sand slide" from their sample. Pass out index cards and glue to each group. If their sand sample is light colored, they take a dark index card; if their sand sample is dark, they take a light colored card.

2. Have students label their card with where their sand came from and their own name.

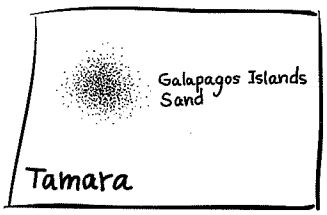
3. Demonstrate how to make a sand slide:

   a. Place a very small dab of white glue near an edge of the card and smear it in a small circle (size of a nickel) using a pinkie finger.

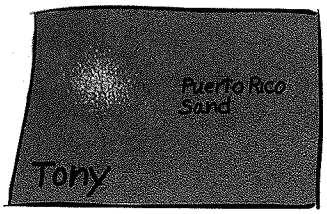
   b. Reach into the sand sample bag and take out a pinch of sand. Sprinkle the sand over the glue and tap any loose sand back into the bag.

4. Have students make their own sand slide. Collect the slides or have students keep them for the next session where they will make detailed observations of their sand grains. Collect the sample bags of sand.

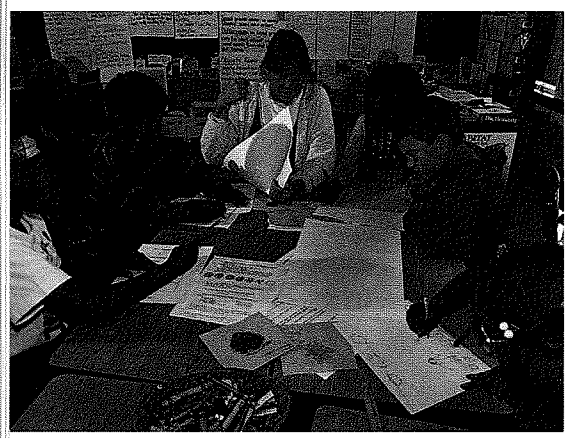
Making a Sand Slide



3" x 5" card (light colored card for dark sand)



3" x 5" card (dark colored card for light sand)



Session 3: Observing and Recording

1. Regroup the students into their Comparing Sands groups of six. Give each student a Sand on Stage student sheet and their sand slide. Give each group the large bag containing the six small bags of sand. Ask each student to get the same small bag of sand they used to make their sand slide. Have available pencils, crayons/markers, magnets in bags, hand lenses (or microscopes), and rock/mineral kits for each group. Older students will be able to go through the activities in their cooperative group at their own speed after you provide simple directions. With younger students, you may need to go through the student sheet task by task with the whole class, guiding each observation. The following is one way you might guide a class of second graders through the Sand on Stage observation and recording activity (directions and questions from the student sheet are in italics):

#1—*Look closely at your sand with a magnifier. List or use crayons to show all the different colors you see.* Students who have difficulty writing should be encouraged to find crayon colors that match the sand colors.

#2—*Draw a picture of some of your sand grains. Draw them BIG!* Encourage students to draw the sand grains about the size of a quarter. They could use the grains drawn in #3 as models.

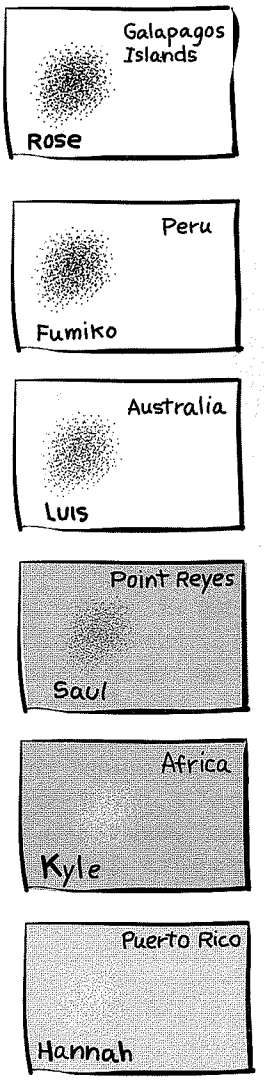
#3—*Circle the pictures that have shapes like your sand.* This task takes some extra concentration, so tell students to help their fellow teammates. Have students look again at their slide through a hand lens (or a microscope). This time look specifically at the shape of individual grains. Does their sand have rounded edges or angular edges? Why are some grains smooth while others have sharp (angular) edges? [Very round grains have been worn smooth for hundreds or thousands of years, while angular grains may have broken off a rock or shell quite recently.]

#4—*Gently rub a magnet on the outside of your bag of sand. Are any of the grains in your sand attracted to the magnet? If so, what color are the magnetic sand grains?* Distribute the magnets in bags. Have students drag a magnet gently across the outside of their bag of sand. If any grains are attracted, this is evidence that the sand contains some magnetic minerals, such as iron or magnetite. They are usually black.

#5—*Which of the following things can you find in your sand?* Students especially enjoy guessing/inferring what their sand grains are made of.

#6—*Look at the rock kit. Does your sand have pieces of rock that match some in the kit? List the kinds of rocks that may be in your sand.* Give each group a rock and/or mineral kit and have students compare their sand grains to rocks in the kit.

#7—*Which sand in your group is the lightest in color? Which is the darkest? Put them in order from lightest to darkest.* Have students pass their sand slides around the circle of their group, looking at each, until they have their own slide back. They should especially notice the colors of the different sands. Ask, "What can you learn by observing the color of your sand?" [Colors give you clues about what your sand is made of—dark sands are often volcanic in origin; light sands can be made of animals like shells or corals, or of quartz from granite mountains.] Now, have



each group arrange all their samples in a line from lightest to darkest and record their answers.

#8—*Compare your sand slide to the size chart below. Imagine that the black dots are grains of sands. Color the group of dots that are about the size of your sand grains. If your sand is not like any of these, use the empty circle to draw how yours looks. Are your grains all about the same size or many different sizes?* This may be confusing for some students. The different groups of dots represent different size grains of sand. They are clustered in a circle similar to the students' cluster of sand on their sand slide.

For older students: Ask, "What might the size of the sand grains tell you about the kind of place your sand sample is from?" [If their grains are very small, they were probably from an area with slow moving water such as a protected bay beach or a pool in a slowly moving stream. Tiny particles can stay put only where the water is moving slowly and gently. Large waves (or fast water) pick up small grains and carry them away down the river or off the beach and out to the ocean. If their sand grains are mainly large, they were probably from a wave-tossed beach where the rough water carried all the smaller grains away. Only the larger grains remained because they were not picked up by the waves.]

#9—*Which sand in your group has the biggest grains? Which has the smallest grains? Put them in order from smallest to biggest.* Have students pass their slides around the group again, this time observing grain size. Next, have each group sequence their sand cards, this time from the smallest grains to the largest grains and record their answers.

For older students: Ask the class to imagine they are a very tiny sand grain, about the size of the smallest grain in their group's samples. What might happen to them if they were hit by a wave or caught in a current? Do they think they would be able to stay in one place? [Small grains are kept moving by even very slowly moving water.] What about if they were one of the larger grains? [Because they are heavier they might stay put until a bigger wave or faster moving current came along.]

2. Have each group take a few minutes to compare their answers on the student sheets. Why might some people have gotten different answers? What do the differences tell you about the different types of sand?

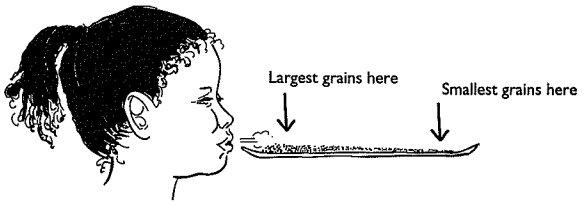
Sand in the Wind

1. Explain that sand is almost always in constant motion, and that the sand grains on a beach one day might be entirely replaced by others in a few weeks. One way that sand moves is by the wind.

2. Hand out the trays of sand to each group and give each student a chance to **gently** blow on it for five seconds or so. What happens? At a real beach, the wind blows almost all the time. What effect does this have on beach and dune sand? [The "wind" separates or sorts the grains by size—the smaller ones are blown the farthest.]

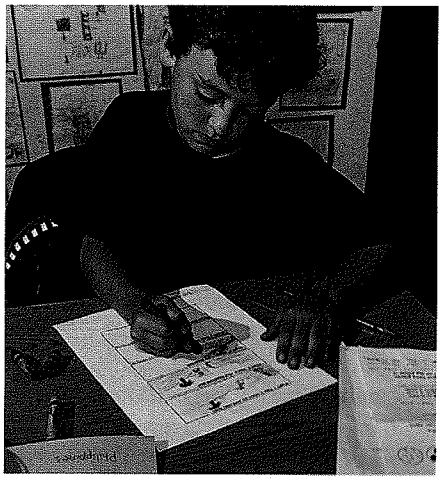
3. Have students look at their own sand slide now. If all the grains are roughly the same size, they may have come from a windy beach. If the sample is "mixed" in size, then it may have been from a beach with very little wind. Can they make a guess about whether or not their sand came from a windy place?

4. When they are finished, groups should clean up the materials at their tables. Tell them they will need their Sand on Stage student sheet, sand slide, and small bag of sand for the next session.



Blowing lightly on a pile of sand

If you don't want to prepare separate trays for each group, you can do this as a whole group demonstration using one tray.



Session 4: The Experts Meet

1. Ask students from each group with the same type of sand to meet together in "expert groups." Have them compare their answers on their Sand on Stage student sheets and discuss any discrepancies.

2. Ask them to think about where their sand may have come from before it showed up on the beach. A coral reef? A mountain? A lava flow? Clam and mussel shells? Is the sand very old or very young? What evidence do they have for each inference? (Note: Younger students may benefit more from an informal discussion such as this, rather than completing the Expert Group student sheet.)

3. Have each student complete an Expert Group student sheet, working together in their groups. As they consider the questions, especially #3 and #4, you may need to focus the students' thinking by having them recall their responses to the Sand on Stage student sheets, as well as previous discussions about how rocks, shells, etc., become grains of sand.

Some teachers have suggested completing the Expert Group sheets after doing Activity 3: The Sights that Sand has Seen. In that activity, students listen to a story of how a grain of sand is formed and makes its way to a sandy beach. Other teachers feel that the Expert Group sheet better prepares students to understand the story, so recommend that it be done as shown here, as part of Activity 2. Either order will work.

For younger students who may have difficulty making guesses or inferences from the evidence they've collected, drawing and discussing an imaginary beach is fine. Notice whether they include descriptions of color, the types of material that became their sand, and the age of the sand as identified by being sharp or smooth. These characteristics are the most visible and therefore the most concrete, and this helps students in deriving simple cause-and-effect statements about them. For example, a student might describe their beach this way: "My beach has white and pink sand from clam shells. The sand is young sand because the sand grains are sharp and pointy. My beach has a lot of people swimming because the waves are small."

For older students, provide some clues to draw their beach such as: if they think they have coral sand, the water will probably be clear and blue, and the animals living around the coral reef will be brightly colored. If they think there is lava in their sand, there must be a volcano nearby. If the grains are very large, the waves are probably big, and maybe it would be a good beach for surfing. If the grains are small, the water is probably calm, and it may be a good beach for swimming and snorkeling. They could also label the drawings to point out features that they think contributed to the type of sand they have.

Inferring roughness and calmness of the water from the sand grain size is a difficult "leap" to make, even for adults! To help students, ask them to think about what size grains could calm, gentle waves push onto a beach? What about big, strong waves?

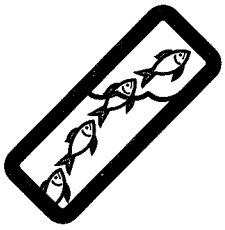
4. Now ask them to imagine the beach where their sand may have come from. What does it look like? Is it a sunny warm place with tropical animals or a cold place? Have each student draw a picture of what they think this beach may look like.

5. Students can present their drawings and evidence to the class. Collect the student sheets, artwork, sand slides, and bags of sand. Post the student art around the room next to the sand sample it illustrates.

6. Discuss with students why sand is important to people. [It creates fun and beautiful places for us to walk and play. It is an important home to many, many plants and animals. Many things that we use are made from sand.] Ask, "What are some items made from sand?" [It is important for oil and cement production. Glass is made from melted and reformed sand. Sand is used for sand painting, sand-blasting, sandpaper, in hourglasses, and of course, in playgrounds and sandboxes. In fact, if it wasn't for sand, we might not have paved streets, tall buildings, concrete sidewalks, or glass windows.]

7. Hold up the Key Concepts for this activity one at a time, and have one or more students read them aloud. Post them near your sand table or Sand Display for students to refer to later.

- **Sand grains can be made of animals, plants, rocks, or minerals.**
- **Sand grains come in many different shapes, sizes, and colors.**
- **Differences between sand grains can be clues about where the sand came from and how it got to the beach.**



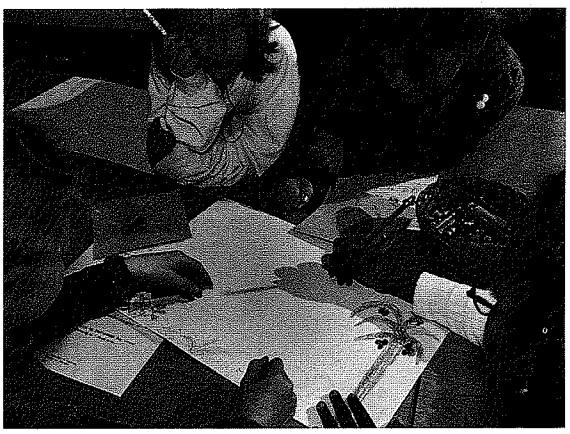
Going Further

1. Encourage younger students to "get a feel for sand." Set up a sand table or tub for free exploration, and encourage students to explore it individually or in small groups when they have free time. You might put out water, funnels, sieves, spoons, or cups. Have them look at the sand closely, run it through their fingers, make sand sculptures, or look for evidence of life. Put out drawing paper and pens for students to spontane-

ously write descriptions or illustrate sand-related images. Every day or so, add a new item: a shell, feather, rock, or piece of litter. As mentioned in the "Getting Ready Tips" (see page 11) this would make a nice pre-teaching exploration station before presenting the activities in this guide.

2. Students can compare their individual sand samples to the sand in the Beach Buckets from Activity 1.

3. Bring in old stuff to make sand, such as rocks, shells, bones, plastic, and pencils. Wrap them in pillowcases or towels and have a few students take turns breaking them up outside with hammers. (Use old towels or pillowcases—they may end up with holes and rips!) Make sure you keep a secret list of all your "ingredients," and see if students can discover what they are by examining the new sand. Make exhibits in class to display the new sand samples next to a list or picture of the ingredients.



4. Have students explore some geography related to their sand samples. Use wall maps, globes, atlases, and encyclopedias to locate the places from which the sand came. Measure with string and latitude lines to determine how far each place is from where you live. Is there anything special that anyone knows or can find out about each location? Are there mountains or volcanoes nearby? What languages do the people living there speak? Is the ocean there cold or warm?

5. Have students continue to collect sand samples. Find a class in another region of the state, country, or world to be pen pals with, and send each other sand samples. Create a sand exhibit or museum, with descriptions of each sample.

You can communicate with other LHS MARE schools via e-mail. Call or write MARE, Lawrence Hall of Science, U.C. Berkeley, Berkeley, CA 94720-5200, (510) 642-5008, mare_lhs@uclink4.berkeley.edu

6. Students can go to the library and find books about sand and sandy beaches. After they have read a few, they can classify them into groups: fiction, non-fiction, about people, about other animals.

7. Take a field trip to a sandy place. Students can act as detectives to determine if the sand has a source which is close by or far away. Sometimes sand is brought in by people from other places to "make" a sandy beach. What evidence can they find about its origin and evolution? What clues are observable [rocks, cliffs, shells, streams, etc.] Is the beach "cleaned?" By who or what? [people, birds, currents, high tides]

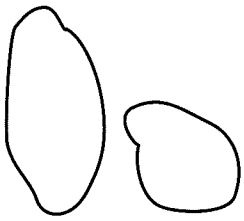
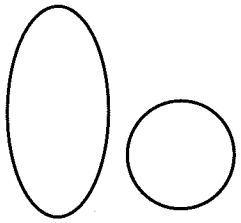
Name _____

SAND ON STAGE!

1. Look closely at your sand with a magnifier. List or use crayons to show all the different colors you see.

2. Draw a picture of some of your sand grains. Draw them BIG!

3. Circle the pictures that have shapes like your sand.

not rounded	a little rounded	very rounded
		

4. Gently rub a magnet on the outside of your bag of sand. Are any of the grains in your sand attracted to the magnet?

If so, what color are the magnetic sand grains?

5. Which of the following things can you find in your sand?

- O small rocks
- O pieces of glass
- O pieces of plants
- O other things. They are:
- O pieces of shells
- O pieces of wood
- O pieces of plastic

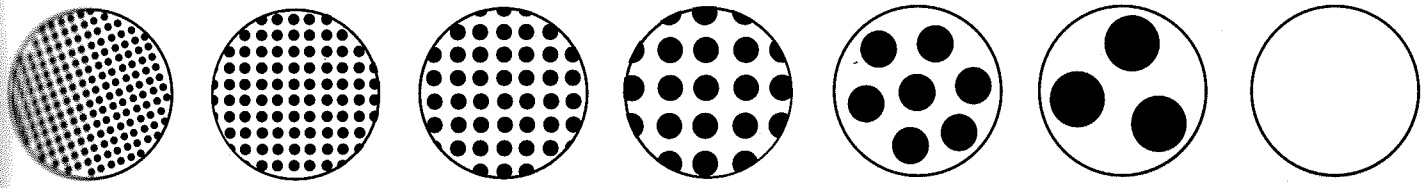
6. Look at the rock kit. Does your sand have pieces of rock that match some in the kit? List the kinds of rocks that may be in your sand.

7. Which sand in your cooperative group is the lightest in color?

Which is the darkest?

Put them in order from lightest to darkest.

8. Compare your sand slide to the size chart below. Imagine that the black dots are grains of sands. Color the group of dots that are about the size of your sand grains. If your sand is not like any of these use the empty circle to draw how yours looks.



Are your grains all about the same size or many different sizes?

9. Which sand in your cooperative group has the biggest grains?

Which has the smallest grains?

Put them in order from smallest to biggest.

Name _____

EXPERT GROUP STUDENT SHEET

Location where your sand was collected_____.

1. What do you think the beach environment and ocean waves were like in the area where your sand was collected?

2. What do you think your sand is made of?

3. How do you think your sand got to the beach?

4. On the back of this sheet, draw a series of pictures to show the story of how your sand became sand. Be sure to include crashing waves, freezing mountain tops, rushing rivers, or exploding volcanoes, or anything else you think helped to form your sand.

• **Part 1:** Draw a picture of where your sand came from (a clam, a mountain, a coral reef, or ?...) before it arrived on the beach.

• **Part 2:** Here's what happened next.

• **Part 3:** Look what happened next!

• My grain of sand now looks like this.