

Pebbles, Sand, and Silt

Pebbles, Sand, and Silt > Investigation 1: *First Rocks* >

Part 2: *Washing Three Rocks*, page 13

Washing Rocks Outdoors

When to Go Out

Following Part 2, take students out to collect their own rocks in the schoolyard and repeat the washing activity outdoors.

Outdoor Objective

Students discover that if they look carefully, rocks can be found everywhere.

Materials

For Each Student 1 Plastic cup

1 Hand lens

For the Class

1 Pitcher of water

Getting Ready

Time: 10–25 min. Flexible—depending on how much time you want to devote to it. You could combine this lesson and the next outdoor lesson if you do not have time for both.

Safety Note: Remind students to avoid broken glass or other dangerous items.

Conservation: Pour any remaining water on plants to reinforce the fact that plants need water to live, and to remind students to conserve water whenever possible.

Guiding the Investigation

1. Take students outside, set the boundaries, and ask each student to find three to five rocks.
2. You might ask students to search for rocks that are similar or dissimilar: in size, color, texture, or hardness.
3. Pour water into the students' cups after they have found their rocks.
4. Have students wash their rocks and observe what happens. Discuss where the dirt in the cup of water comes from. If time allows, they can find more rocks to wash.

Outdoor Activities At a Glance

Investigation 1

Washing Rocks Outdoors

Collecting Rocks in the Schoolyard

Investigation 2

Screening Schoolyard Earth Materials

Looking for Sand and Silt in the Schoolyard

Visit a Quarry (FOSS® Extension)

Look for Clay Soils (FOSS® Extension)

Investigation 3

Rocks in Use

Making Bricks

Investigation 4

Searching for Soil in the Schoolyard

Priority activities appear in **green**.



“My students found so many different rocks. I have no idea how they did it. I was so surprised!”

Teresa Strong
Science Specialist

“The excitement increased around the pebbles with each trip outside. Students regularly came in for the day with observations of a rock or stone.”

Rose Reeves Harris
Grade 2 Classroom Teacher



5. You may decide to take some rocks indoors to begin the class collection (see below). Or you may choose to begin an Outdoor Rock Collection. Have students replace all other rocks. Some may wish to keep theirs.
6. Display the rocks in the classroom. Some teachers have used egg cartons to organize the display.

Pebbles, Sand, and Silt > Investigation 1: *First Rocks* >
Part 5: *Start a Rock Collection*, page 26

Collecting Rocks in the Schoolyard

When to Go Out

Start a rock collection as early in the module as you can to help build excitement and to have more time for students to develop and use their collection. Take students outside following Part 3 (pages 18–21) or after Part 5 (pages 26–29).

Outdoor Objective

Students search for rocks and build a rock collection. Students see that rocks have a number of different properties and discover the great variety of rocks in the schoolyard (and the world at large).

Getting Ready

Time: 10–25 min. Flexible—depending on how much time you want to devote to it.

Safety Note: Remind students to avoid broken glass or other dangerous items.

Site: Begin an outdoor rock collection in a special location away from recess traffic.

Guiding the Investigation

1. Distribute containers, bags, or egg cartons to students to carry their rocks.
2. Gather your students outside to discuss good places to search for rocks and to remind them of the expectations for appropriate rocks (not too big). Review where Peter of *Peter and the Rocks* looked for rocks.

3. Set the amount of time students will be searching, call out time warnings periodically.
4. You may want to allow students to wash their rocks using the water you brought out.
5. Complete student sheet no. 2 *Rock Record* for at least one rock.

Pebbles, Sand, and Silt > Investigation 2: *River Rocks* >

Part 1: *Screening River Rocks*, page 8

Screening Schoolyard Earth Materials

When to Go Out

Following Part 1, repeat screening activity outdoors with earth materials found in the schoolyard.

Outdoor Objective

Students will repeat the screening rocks activity outside to see that most earth material comes in various sizes that can be separated for specific uses.

Materials

For Each Pair 1 Bag filled with the screens, plates, and containers from Part 1

Spoons

For the Class Extra containers and plates for additional sifting

Getting Ready

Time: 20–45 min. (Depending on how well your students have grasped the sifting process).

What You Might Find:

Students will enthusiastically engage in this activity and want to collect a number of rocks. Decide how many you can fit in your classroom, where they will be stored, and whether or not students can add to this collection over time. Students will become very attached to their rocks!

“The rocks they find themselves are so much more important to them!”

Teresa Strong
Science Specialist

“By the end of the lesson, there were pairs of kids just going back and forth and sifting. It was definitely way beyond my expectations of what was going to be done.”

Eric Meuse
Science Specialist



What You Might Find:

Students will develop ownership of this process by repeating it outside. Most students LOVE the opportunity to dig in the dirt.

Students may need help remembering the steps to this complicated lesson. You may need to meet in your designated discussion spot to review directions again. Students may also need help gathering a cup of the earth materials.

You may find that some students have not dug in the dirt before and some may not like getting dirty. Let them know they can scrub their hands as soon as they get inside.

Safety Note: Remind students not to pick up broken glass or other dangerous items. Students should wash their hands after this activity as soon as you return to the school.

Guiding the Investigation

1. Repeat directions to students for sifting while inside.
2. Bring students to the pre-selected best location for sifting the widest variety of earth materials.
3. Demonstrate how to scrape the ground with spoons to collect a cup of earth material.
4. Have pairs of students begin working together to sift one cup.
5. Help students make the connection between what they are doing and the rock sorting in quarries, gardening, or even archaeological digs.
6. When students are done, they should dump their results back on the ground and begin again in a different location if time allows.
7. You may want to end the lesson inside by looking at pictures of rock sorting at quarries.



Pebbles, Sand, and Silt > Investigation 2: *River Rocks* >

Part 3: *Sand and Silt*, page 18

Looking for Sand and Silt in the Schoolyard

When to Go Out

Following Part 3 (pages 18–23), take students outside to look for silt and sand.

Outdoor Objective

Students will discover that sand and silt occur naturally in the schoolyard.

Materials

For Each Pair	1 Vial with a lid
	2 Spoons
For the Class	1 Pitcher of water
	Extra vials and lids

Guiding the Investigation

1. Students will collect the sand (a puddle on the pavement after a rainstorm is ideal).
2. Have students fill their vials with water, shake the vials, and then return the vials to the room to let them settle overnight.
3. The next day students should observe their vials. Remind students that the layer on top of the sand is silt. Students should touch the silt as they did in Part 3. Students should notice the slightly rough texture of the silt (not grainy like sand or smooth like clay).

What You Might Find:

Students may have a hard time finding clay in soil—but the search itself is worth the effort. Students will think about the make up of the soil and all the things that go into it.

“We went outside and dug, sifted, and collected. It was a big hit with the students!”

Nancy Mullane
Science Specialist



Pebbles, Sand, and Silt > Investigation 2: *River Rocks*

Visit a Quarry

FOSS® Extension, page 31

Outdoor Objective

Students will see various earth materials being sorted by size and the equipment that does the heavy work.

Guiding the Investigation

If you are lucky enough to be in a school near a quarry—visit it!

Pebbles, Sand, and Silt > Investigation 2: *River Rocks*

Look for Clay Soils

FOSS® Extension, page 32

When to Go Out

Following Part 4 (pages 24–29), go outside and look for soil containing clay—it is sticky like the clay students worked with inside.

Outdoor Objective

Students will discover that clay soil occurs naturally in some schoolyards, and where it doesn't, the process of searching for it helps students learn to distinguish different earth materials.

Materials

For Each Student	1 Craft stick
	1 Vial

Getting Ready

Time: 15–20 min.

Guiding the Investigation

1. Ask students where they think they might find clay in the schoolyard, and why.
2. Have students spread out and collect samples using their craft sticks to scrape soil into their vial.



3. If a student thinks they have found clay, gather together to have a look and discuss the evidence for whether or not it is clay.
4. Have students bring in their samples to compare with the clay they used in class. *Ask, How do they compare?*

Pebbles, Sand, and Silt > Investigation 3: *Using Rocks* >

Part 1: *Rocks in Use*, page 8

Rocks in Use

When to Go Out

Part 1 is conducted outdoors. Refer to the FOSS Teacher Guide for complete instructions.

Outdoor Objective

Students search for rocks in use and expand upon their understanding of how earth materials can be used.

Materials

For Each Student	1 Hand lens
	Science notebook
	1 Clipboard
	1 Pencil

Guiding the Investigation

If possible, have students record their observations in their notebooks while they are outdoors and looking directly at the examples they find of earth materials in use.

Pebbles, Sand, and Silt > Investigation 3: *Using Rocks* >

Part 5: *Making Bricks*, page 24

Making Bricks

When to Go Out

Steps 2–7 (pages 27–28) can be done outdoors (as suggested in Getting Ready, Step 8). It’s messy! Don’t forget to look at some bricks while you are out.

Where You Might Find Rocks in Use:

Concrete, cement, asphalt, bricks, and mortar; the school building; sidewalk; steps; playground; adjacent buildings; nearby statues.

Students may be surprised that the mortar between bricks has tiny pebbles in it, that the asphalt actually has quite big pebbles in it, and that the bricks themselves contain little pebbles. You will need to encourage them to look very, very closely.

“My students used magnifying glasses to see the crystals. It was also important to them to touch the various rocks in different forms.”

Nancy Mullane
Science Specialist



“Students in the city see science as a classroom activity, not as something they are actually living within. Teaching outside is so enlightening for them.”

Rose Reeves Harris
Grade 2 Classroom Teacher

Pebbles, Sand, and Silt > Investigation 4: *Soil Explorations* >
Part 2: *Soil Search*, page 15

Searching for Soil in the Schoolyard

When to Go Out

Part 2 is conducted outdoors. Refer to the FOSS Teacher Guide for complete instructions.

Getting Ready

Site: Try looking in planted garden beds, under bark mulch, at the base of trees, under bushes, in the compacted ground near play areas, or at dirt that has accumulated on the asphalt. How do the soils compare?

