PEBBLES

SAND

AND

SILT

NGSS

2016
DM

1-1

What happens when

stones, earth materials → **rocks** **rub** (touch) **together** } all

red	gray	white
• pieces broke off • looks like sand	• dust little • hard to break	• dust lots • soft

Hint: Rub same color rocks together.

Intro to weathering.

* Save all dust in vial.

I observed that when I rubbed rocks together, dust and pieces of rock broke off. I know this because when I rubbed the red rocks together, I saw and felt tiny pieces of rock on the paper. (sand) When I rubbed the gray rocks, I saw very little dust coming off. When I rubbed the white rocks, lots of dusty powder came off. I wonder what will happen if I rub 2 different rocks together.

1-2

What happens when rocks are placed in wet water?

* one rock at a time

Data: Table with bullets or illustrate rocks wet and dry.

red scoria	white tuff	gray basalt
• bubbles	• patterns	• shiny

* names given

or

	scoria	tuff	basalt
dry	red		
wet	deeper red		

Colored pencils

1-2

I observed many differences when my rocks were placed in water. My data shows that scoria rock makes the most bubbles. Basalt rock turns a dark blackish color. Tuff rock makes the water cloudy. I wonder what would happen if I placed the rocks in salt water.

Videos:

All about Volcanoes.

Home School

Build Volcano and doodlecast it.

Research questions:

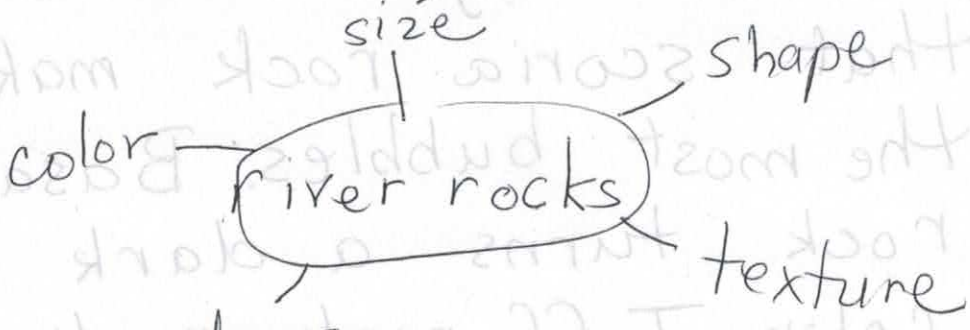
What is a volcano? 11:14

How people use volcanic heat to create energy? 15:50

1-3

How are river rocks the same? alike

Web (whole class)



Collect data in notebook - grouping one property at a time.

COLOR

lt. gray	speckled gray	blackish gray
10	4	4

1-3

I sorted my river rocks using two properties. First, I sorted by color and found 10 light gray, 4 speckled gray, and 4 blackish gray. Second, I sorted by patterns and found 6 striped, 7 dotted, and 5 zigzags.

I wonder how the properties will change if I put the rocks in water.

1-4

describe rocks

What are the properties of schoolyard rocks?

Students find rocks outside, wash them, share properties, and set up display in classroom

Reading Research Session:

Exploring Rocks

F.Q.: What are the properties of rocks?
(Purpose)

5

How many ways can rocks be sorted?

Whole class activities

Use sorting mats

Use multimedia sorting technology

Research Reading Sessions:

Color! Rocks

Purpose: What gives a rock color?

1- Check 1

1-5

How many ways can rocks be sorted?

Whole class activities.

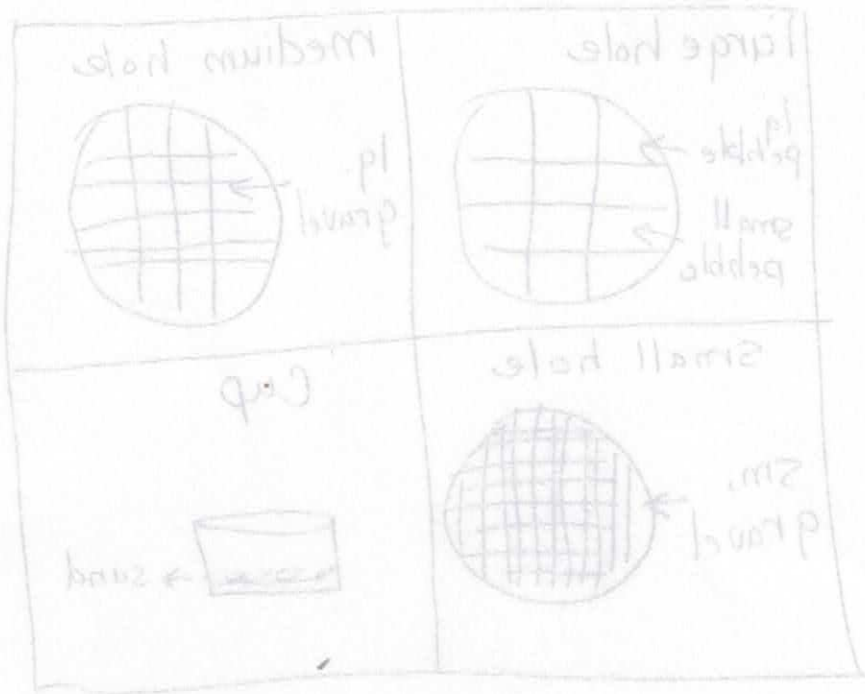
Use sorting mats
Use multimedia sorting technology.

Research Reading Session:

Colorful Rocks

Purpose: What gives a rock color?

1- Check 1


Large hole
Medium hole
Small hole
Cup

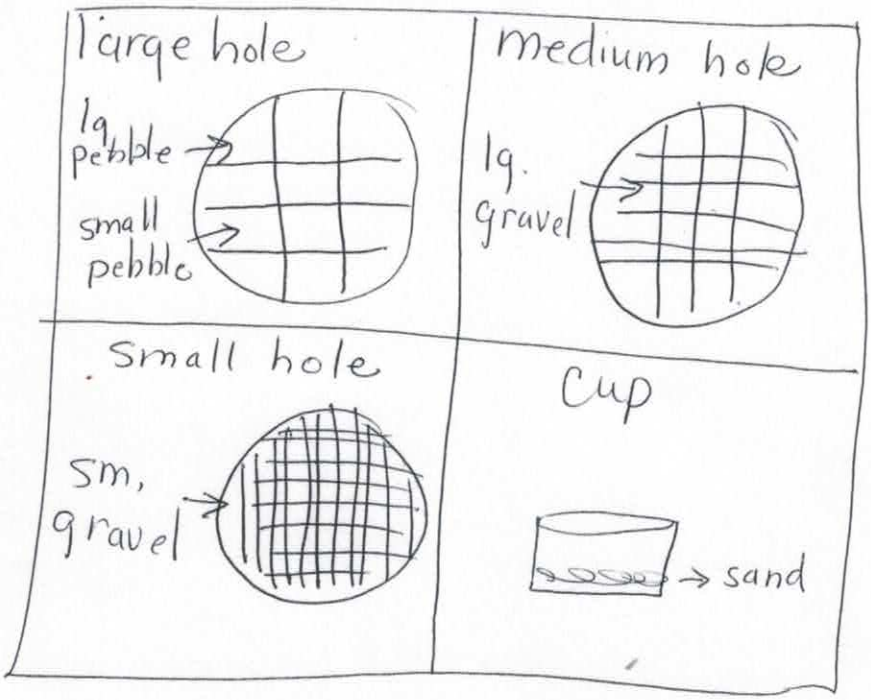
2-1

How can rocks be separated by size?

take apart

how big

Can do lesson open-ended
or
follow steps in manuel



Teacher introduces rock size labels after 1st screening.

I separated my rocks using screens with different size holes. First, I observed that the large and small pebbles stay on top of the large hole screen. Second, I noticed that the large gravel stays on top of the medium hole screen. Next I noticed that the small gravel stays on top of the small hole screen. Last, I observed that the sand went through all the screens and stayed in the cup. It reminds me of playing with sand at the beach and building castles.

2-2

How else can rocks be sorted by size?

Use Sand, Gravel, + Pebbles Mat
(glue or draw)

Research Reading

The Story of Sand

Purpose: What is the story of sand

Add {boulders / cobbles} to Vocab. list

Q-3

Date:

Q. Is there any Earth Material smaller than sand?

Data:

Day 1
after shaking

Day 2
after sitting overnight

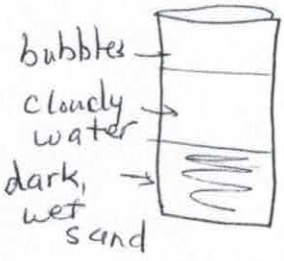
2-3

Date:

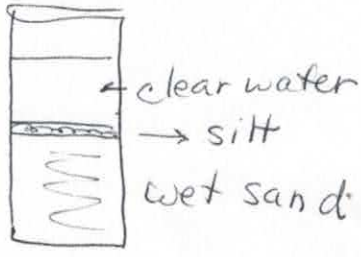
FQ: Is there an earth material smaller than sand?

Data:

Day 1
after shaking



Day 2
after sitting overnight

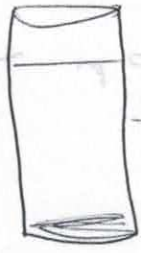


2-3

I observed an earth material smaller than sand in my vial the second day. After the vial settled, I saw a layer of silt on top of the sand. I wonder what is smaller than silt.

2-4

What earth material is smaller than silt?

	Day 1	Day 2
Cup	 soft wet clay	 hard dry clay
Vial	shaking  cloudy water, clay ball	 cloudy H_2O, clay

Formative Assessment

Step 20

① Reading Research:

Rocks Moved

Purpose: According to the words and illustrations, what can move rocks of all sizes?

② Video Research:

All About Land Formations

I observed that there was dust on my hand after I worked with clay. Clay is an earth material smaller than silt. I observed that the ball of clay in the open cup got hard and dry overnight. I observed that the clay in the vial with water got mushy and cloudy water. I wonder what would happen if I added water to the hard ball in the cup. I think it would get soft like the clay in the vial.

③ Reading Research

Landforms

I - check

Video 4.4
What are the forces that wear away at land? 15:59-16:18
What landforms are cut by weathering 16:18-17:00
How does ice create landforms? 17:33-19:35

3-1

How do people use earth materials?

Outdoors

Notebook Master 12 on clipboard for gathering data.

Glue sheet in notebook after.

Review vocabulary #8

Research reading

Making Things w/ Rocks

Purpose: Why do people use certain rocks for different purposes (reasons/things)?

3-1

I observed that people used earth materials in many ways. First, I observed clay and sand in the brick wall. Next, I observed pebbles and gravel in the playground. Last, I observed cobbles in the sidewalk by the street. It surprised me that . . . because . . .

3-2

What does sand do for sandpaper?

Data: Sand rubbings to glue in notebook. (fine, medium, coarse

Compare sanding results with craft stick. #10

* Lots of talk with evidence!

3-3

How can we make a sand sculpture?

Engineering Challenge to create sculpture w/sand mixture

Performance Assessment

Drawing of sculpture

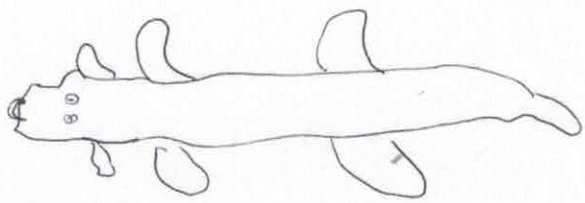
3-3

How can we make a sand sculpture?

Engineering Challenge to create sculpture w/ sand mixture.

Performance assessment

Drawing of sculpture



I made my sand sculpture in the shape of an alligator. It took me a while to figure out how much matrix and sand to mix. I used 4 spoons of sand to make my sculpture. When I make a sand castle at the beach, I have to mix water with sand to make it stand up.

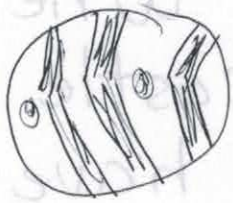
3-4

What makes clay the best earth material for making beads?

Art connection.

Paint when dry.

Illustrate bead.



* Clay sticks together well, hardens when dry.

Date

FQ: How are bricks made?

Date: list ingredients + illustrate

- clay
- soil
- grass
- straw
- weeds
- water

* Brick for demonstration

Reading: What are Natural Resources?

Purpose: locate the natural resources in the illustrations.

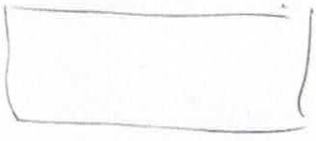
I-check 3

3-5

Date:

FQ: How are bricks made?

Data: list ingredients + illustrate



- clay
- soil
- grass
- straw
- weeds
- water

* Brick for demonstration

Reading: What are Natural Resources?

Purpose: Locate the natural resources in the illustrations.

I-check 3

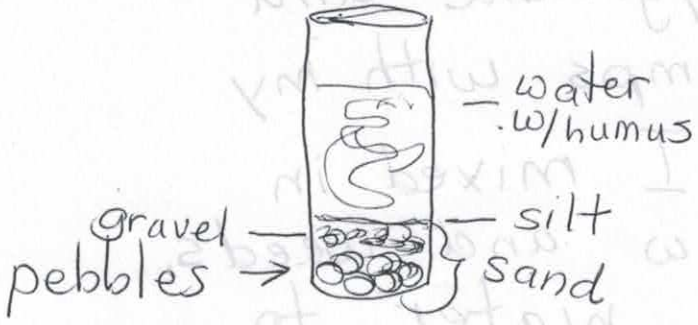
I made my brick by mixing a lot of ingredients together. First, I dug up some clay soil in the playground and broke up the lumps with my fingers. Second, I mixed in some grass, straw and weeds. Last, I added water to blend it all together. I know that clay mixes with water and it is easy to mold because I did that with my clay bead. I know it hardens when it dries like a brick.

4-1

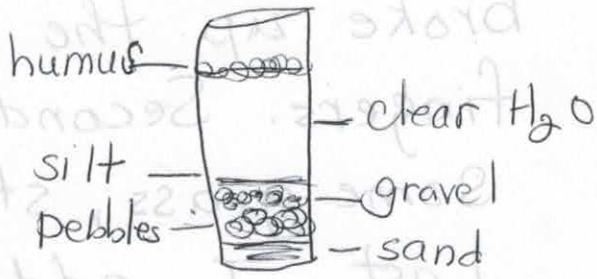
What is soil?

mixture of earth materials

Day 1



Day 2



Whole class: #26

To deeper understanding.

Claim: Soil does not change

Evidence For	Evidence against
same ingredients- different %	weathering of rocks
	decaying of animals + plants
	amt. of moisture + air

Soil is a mixture of different earth materials. It has pebbles, gravel, sand, clay and humus in it. But different soils can have different amounts of each. I used the vials to see the layers in our soil mixture. I wonder what the soil in my yard looks like.

4-2

How do soils differ?

sidewalk soil

homemade soil

Research Readings:

What is in Soil?

Purpose: Why are worms good for soil?

Testing Soils

Purpose: Do seeds grow better in soil or sand?

The homemade soil and the soil I found near the sidewalk have some of the same materials. But they are very different in color and the way they feel. I feel the outside soil is real scratchy and the homemade soil is smooth. I wonder how the soil in my yard feels and looks.

It surprised me that . . .

What is soil? Video
What is layering?
7:23-9:00
What are soil properties?
10:15-11:09
What do farmers do to protect soil?
18:55

4-3

FQ- Where is water found in our community?

Research reading (Where is water found?)
Purpose: Where can we find natural sources of water
Sources of water Cards

Research reading (States of water)
Purpose: What are the 3 states of water?

4-4 How can soil erosion (washes away) be reduced? (less)

Research reading (Erosion)

Research Reading (Ways to Represent Land + Water)

T-check 4