<table>
<thead>
<tr>
<th>NGSS</th>
<th>SAND AND SILT</th>
<th>PEBBLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hunt</td>
<td>Leap</td>
<td>2016</td>
</tr>
<tr>
<td>Keep</td>
<td>Same</td>
<td></td>
</tr>
<tr>
<td>you</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
What happens when rocks rub together?

<table>
<thead>
<tr>
<th>red</th>
<th>gray</th>
<th>white</th>
</tr>
</thead>
<tbody>
<tr>
<td>pieces broke off</td>
<td>dust little</td>
<td>dust lots</td>
</tr>
<tr>
<td>looks like sand</td>
<td>hard to break</td>
<td>soft</td>
</tr>
</tbody>
</table>

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 different rocks together.
What happens when rocks are placed in water?

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

<table>
<thead>
<tr>
<th>red scoria</th>
<th>white tuff</th>
<th>gray basalt</th>
</tr>
</thead>
<tbody>
<tr>
<td>bubbles</td>
<td>patterns</td>
<td>shiny</td>
</tr>
</tbody>
</table>

*names given

or

<table>
<thead>
<tr>
<th>scoria</th>
<th>tuff</th>
<th>basalt</th>
</tr>
</thead>
<tbody>
<tr>
<td>dry red</td>
<td></td>
<td></td>
</tr>
<tr>
<td>wet deeper red</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Colored pencils
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.
How are river rocks the same? What are the properties?

Web (Whole class):
- size
- shape
- color
- texture
- edges

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

COLOR

<table>
<thead>
<tr>
<th>Lt. gray</th>
<th>speckled gray</th>
<th>blackish gray</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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.
What are the properties of schoolyard rocks?

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

Reading Research Session: Exploring Rocks

FQ: What are the properties of rocks?
How many colors can rocks be sorted into?

White class activities:

Use sorting more sophisticated
Use multiple logodons

Research reading session:

Colorful Rocks

Purpose: Imitate given a lock color

1

Check 1
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
How can rocks be separated by size?

Can we describe an open-ended follow-up steps in manner?

Teacher introduces lock 2 size table after list ascending
How can rocks be separated by size?

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.
How else can rocks be sorted by size?

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

Second, I notice that the holes were made on the edge of the force pole's scree. It will dry down steps on top of the scree's crumb. I will bring up scree.

Research Reading

The Story of Sand
Purpose: What is the story of sand?

Add boulders to vocab. list.
For: Top soil on Earth materials
smaller than sand.

Data:

Day 5
after sitting overnight
water makeup
- sit
one side

Day 1
after spraying

- sprout
- water
- grow
Date:

Fq: Is there an earth material smaller than sand?

Data:

Day 1
after shaking

Day 2
after sitting overnight

bubble
cloudy water
dark, wet sand

clear water
silt
wet sand
I observed an earth material smaller than sand in my vial, the second clay. After the vial settled, I saw a layer of silt on top of the sand. I wonder what is smaller than silt.
What earth material is smaller than silt?

<table>
<thead>
<tr>
<th></th>
<th>Day 1</th>
<th>Day 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cup</strong></td>
<td>soft wet clay</td>
<td>hard dry clay</td>
</tr>
<tr>
<td><strong>Vial</strong></td>
<td>shaking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>cloudy water, clay ball</td>
<td>cloudy H₂O, clay</td>
</tr>
</tbody>
</table>

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: 94
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
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)?
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...
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!
How can we make a sand sculpture?

Engineering Challenge: Create a sculpture with a sand mixture.

Performance Assessment:

Diagram of sculpture:
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.
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?

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.
What is soil?

Day 1

- gravel
- pebbles
- silt
- sand
- water with humus

Day 2

- humus
- silt
- pebbles
- gravel
- clear H₂O

Whole class: #26

To deepen understanding.

Claim: Soil does not change

Evidence for:
- same ingredients
- different %

Evidence against:
- weathering of rocks
- decaying of animals + plants
- amount of moisture + air

I mixed my plaster with water a lot of ingredients together. I know that clay mixes with water and it is easy to mold. I added it all together. I pressed the plaster.
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.
How do soils differ?

Soils are mixtures of different materials. Different soils contain different amounts of sand, silt, and clay. Plants grow better in soils that contain the right amount of water and easy-to-digest nutrients. People draw samples of soil to see what they have. They mix different soils and add water to see if the soil is easy to dig. They look for worms. Worms are good for 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
F. Q.: Where is water found in our community?

Research reading (Where is water found?)

Purpose: Where can we find natural sources of water?

4-4

How can soil erosion be reduced?

Research reading (Erosion)

Research reading (Ways to represent land + water)

1-check 4