Instructional Sequence

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What processes change Earth's surface?

Students will perform experiments with a variety of materials that will show them how different processes work, including plate tectonics, and physical and chemical weathering.
Students will compare and contrast chemical and physical weathering.
Students will observe, analyze and classify rocks.
Students will describe processes that build earth's surface up (like converging plates and the rock cycle) and processes that break earth's surface down (like earthquakes and erosion).

#	Est. Date	Activity Label	Activity Description	Activity Functions
1	Day 1 2/14/12	KWL Chart	What do they already know about the main question of the unit: What processes change earth's surface – briefly because we already covered it in the pre-assessment. We will focus more on what they want to learn so that I know what to focus on more with my lessons in order to keep it interesting. Students will share responses by raising their hands and I will write ideas on chart paper. We will post this on the sound bulletin board the whole unit to refer back to as we add/change ideas to answer the central question.	Elicit students' initial ideas
2	Day 1 2/14/12	Vocabulary	I will make a list of the vocabulary words on a giant post-it that I will go back to from time to time to ask about. I will also add more vocabulary words as students think of some to add to the sheet. This will give them an outline of some of the things that we will be talking about throughout the unit.	Introduce scientific ideas Elicit student's initial ideas
3	Day 1 2/14/12	Making a model of earth's surface	Students will mix cornstarch and water to make a model of the material found in earth. The mixture will appear to flow like a liquid in the outstretched palm of the hand. The mixture will seem to harden and feel like a solid when the hand is squeezed. We will discuss the properties of a solid and a liquid.	Explore ideas about patterns

4	Day 1 2/14/12	Concept web	We will make a concept web, as a class, of the forces that change earth's surface, which we will fill in throughout the unit.	Explore ideas about patterns
5	Day 2 2/15/12	Hardboiled Egg	I will hold up a hardboiled egg and ask the class how's it's like the earth. Then I will cut it in half and show them how thing the shell (crust) is.	Establish a question
6	Day 2 2/15/12	The Crust and the Core	Students will look on page 263-5 of their books for a description of the different types of crusts, the mantle, and the core of the earth.	Introduce scientific ideas
7	Day 2 2/15/12	Dynamic Earth	Students will do an activity to create a model of a wedge of earth's interior to scale. Then we will put all the wedges together to make a large earth. Finally we will fill out a chart comparing the different layers of the earth's interior.	Explore phenomena for patterns
8	Day 3 2/16/12	What is it?	I will have students pair up, push their 2 books together so they are touching and put two pencils on top of them. As they move the books apart and together, and side to side, I will ask them what they think that represents on the earth's surface.	Explore phenomena for patterns
9	Day 3 2/16/12	Earthquake Distribution	I will put a map of the world on the board and add a dot each time of earthquakes from 2011. Students will add dots on their own papers along with me. Then they will answer questions about the distribution of the earthquakes and why they think they occur where they do.	Establish a question
10	Day 3 2/16/12	Modeling Plate Movements	Students will represent the movements of plates on earth with boxes, tubes, and paper. They will demonstrate divergent, convergent, and transform boundaries.	Explore phenomena for patterns
11	Day 3 2/16	Earthquake ppt	I will show a collection of pictures of real results of different types of plate movements so it's more concrete and relatable.	Introduce scientific ideas
12	Day 3 2/16/12	Check for Understanding	Students will do a quick write, answering the comprehension questions that I ask them about earthquakes.	Apply to near and distant contexts with support
13	Day 4 2/21/12	Dirt and Rocks	Students will get a rock and a piece of dirt to crush in their fists. They will note which one is easier to crush and why. Then we will share with the whole class.	Students explain patterns

14	Day 4 2/21/12	Chemical Weathering exp. #1	Students will put vinegar, water, or lemon juice on chalk and observe what happens, comparing the results to rocks.	Explore phenomena for patterns
15	Day 4 2/21/12	Physical Weathering exp. #1	Students will concentrate on the physical weathering of abrasion. They will shake larger rocks in a container full of gravel and observe what happens to the larger rocks.	Explore phenomena for patterns
16	Day 5 2/22/12	Chemical Weathering exp. #2	Students will do an experiment using vinegar, salt, vinegar and salt, vinegar and salt and hydrogen peroxide, or air. Over time they will observe what happens to the pennies using magnifying glasses. They will then place a nail in the salt and vinegar and observe.	Explore phenomena for patterns
17*	Day 5 2/22/12	Chemical weathering exp. #3	Students will place steel wool into bowls of water, water and salt, and air. Over 5 days they will observe the changes of the steel wool and record their results.	Explore phenomena for patterns
18	Day 5 2/22/12	Venn Diagram	As a class we will compare chemical weathering and physical weathering, noting their similarities and differences.	Explore ideas about patterns
19	Day 5 2/22/12	Chemical and Physical Weather Wkst	Students will read through examples of weathering and decide whether it's chemical or physical weathering	Apply with fading support
20	Day 6 2/23/12	Erosion Comic Book	I will do a read-aloud of a book about erosion written as a comic story.	Introduce scientific ideas
21	Day 6 2/23/12	Erosion List	We will make a list of things that can cause erosion.	Students explain patterns
22*	Day 6 2/23/12	Frozen Rocks	We will take a mini vacation to the teachers lounge to show how strong water is. #1: we will place a plate with a rock on it over a completely full cup of water. We will come back and check tomorrow to see the results. #2: we will make balls of clay which we will spray with water and warp in saran wrap. Then we will place those in the freezer and also check again tomorrow to see what happens. *Also we must check and record what we see on our steel wool – Day 1	Explore phenomena for patterns
23	Day 7	Legos	An element is one type of atom (1 green lego piece). *If a molecule includes all oxygen atoms. A mineral is a molecule made of different types of atoms (oxygen and hydrogen – green and white legos –	Share ideas

	2/27/12		but they have to all be the same shape). A rock is a mixture of different molecules. *A rock could include some minerals and some elements. (Some pieces green and white in a certain shape, some pieces red of a different shape.	about patterns
24	Day 7 2/27/12	Comprehend Check	We will think-pair-share about the comprehension questions.	Apply to near and distant contexts with support
25	Day 7 2/27/12	Mineral Game	Students will pair up and try to identify minerals based on color, texture, smell, luster, hardness, shape, and streak. *Also we must check and record what we see on our steel wool – Day 2 *And we need to check the results of our frozen rocks in the freezer.	Apply with fading support
26	Day 8 2/28/12	Observe a Rock	Students will pair up and find 3 small rocks to observe. They will record what they see on their sheet.	Explore phenomena for patterns
27	Day 8 2/28/12	Classifying Rocks	Each student will have a chart to fill out about classifying rocks: sedimentary, igneous, metamorphic. It will include how each rock is formed and what common rocks are each type. Then we will make a diagram of how each type of rock becomes the next and what process it must go through.	Apply to near and distant contexts with support Students explain patterns
28	Day 8 2/28/12	Rock Project	Students will be broken up into groups of three. Each group member will receive a rock type and will be required to do research on that type of rock to find real world examples about where it comes from. Then the groups will come back together and formulate a way through a project of demonstrating or symbolize the rock cycle and how each rock turns into the others.	Compare student and scientific ideas
29	Day 8 2/28/12	Steel Wool	Day 3 of observing and recording the soaking steel wool.	Explore phenomena for patterns
30	Day 9 2/29/12	Steel Wool	Day 4 of observing and recording the soaking steel wool.	Explore phenomena for patterns
31	Day 9	Rock Project	Students will have time to work on their rock projects.	Explore phenomena for

	2/29/12			patterns
30	Day 10 3/1/12	Steel Wool	Day 5 of observing and recording the soaking steel wool.	Students explain patterns
31	Day 10 3/1/12	Rock project	Students will have time to work on their rock projects.	Students explain patterns
32	Day 11 3/6/12	Rock Project	Students will have 10 minutes to prepare with their groups. Then they will present their findings.	Apply with fading support
33	Day 12 3/7/12	Rock Project	If there were some groups who couldn't present, they can finish today.	Apply with fading support
34	Day 12 3/8/12	Review	We will play a review game to prepare for the final test.	Apply with fading support
35	Day 13 3/9/12	Written Assessment	Students will take the written part of their test – it will consist of one long essay response.	Compare student and scientific ideas
36	Day 14 3/10/12	Test part 2	Students will take the second part of their test. It will consist of multiple choice, fill in the blank, short response, and identify the rock.	Apply with fading support