Erosion and Weathering

Teach 1	Names of student(s) teaching:
Teach date: Teach time: Teach length: 45 minutes	Title of lesson: Erosion and Weathering Source (Kit, Lesson, Page #):

Concept statement/Main idea:
Erosion and weather, what processes affect the rocks and how they are changed based on these changes.

Standards for the lesson:
National Science Teachers Association (NSTA) standards for this lesson. PS3.B Conservation of Energy and Energy Transfer and Engineering Design. <u>ESS2.A: Earth Materials and Systems</u> Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather.

Objectives	Evaluation
Write objectives in SWBAT form	Write at least one question to match the objective you listed or describe what you will look at to be sure that students can do this.
SWBAT **identify** what erosion is.	What is erosion?
SWBAT **determine** the difference between types of weathering.	What happens during chemical weathering? What happens during physical weathering?
SWBAT **describe** what deposition is.	What occurs during deposition?

Engagement

Estimated time: 5 minutes

Description of activity: Teacher will ask the students what they think their school looked like years ago.

What the teacher does	What the student does	Possible questions to ask students — think like a student and consider possible student responses
The teacher will ask the students about what they learned on Tuesday and will then ask what they think the school looked like in years passed.	Students will answer questions.	Do you think the school and the school grounds look the same now as they looked right after the school was built in (state the year)? Why or why not? What do you think caused any of the changes you described? Would weathering and/or erosion have anything to do with the changes

Resources needed:

Safety considerations:

Exploration

Estimated time: 15 minutes

Description of activity: Students will have different samples of rocks on their desk and they will look at each of the three rocks in a jar to see the differences in the rock due to weathering.

What the teacher does	What the student does	Possible questions to ask students — think like a student

		and consider possible student responses
Facilitates the activity and guides students along.	Students will form groups and compare the shaken jars to the unshaken ones and look for the differences.	How do the piles of stones differ? Which pile acted as a control group? Can you explain why? How do the jars of water differ? How does this show what happens to rocks and stones through the water erosion process?

Resources needed:

Rocks and water in a jar.

Safety considerations:

Make sure not to open the jar.

Explanation

Estimated time: 10 minutes

Description of activity: The students will complete a card sort.

What the teacher does	What the student does	Possible questions to ask students — think like a student and consider possible student responses
The teacher will go over the definitions with the class of erosion, weathering and the necessary components to forming sedimentary rocks because these processes occur.	Students will complete a card sort.	

Resources needed:

Card Sort

Safety considerations:

Elaboration

Estimated time: 10 minutes

Description of activity: The students will reflect on their time at the playground and determine if any changes will occur after recess, rain, or wind. The students will each come up with one example of physical weathering, chemical weathering, erosion, and deposition. They will draw the example and present it to the class.

What the teacher does	What the student does	Possible questions to ask students — think like a student and consider possible student responses
	Students will form into groups of 2 and describe to the class their rock.	Do you see anything important in the different grains? Are there different minerals in the rock?

Resources needed:

Poster paper

Safety considerations:

Evaluation

Estimated time: 5 minutes

Description of activity: Students will have a worksheet where they will answer the evaluation questions.

What the teacher does	What the student does	Possible questions to ask students — think like a student and consider possible student responses
Administers an evaluation quiz that students will complete on their own.	Complete the evaluation quiz on their own.	W&E Quiz

Resources needed:

Safety considerations:

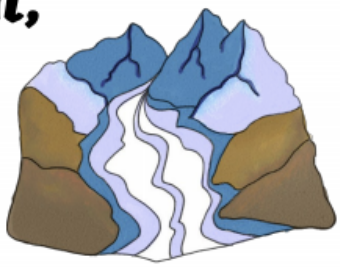
Name: _____ Date: _____

Jar Descriptions

Directions: For each of the jars in front of you indicate what sample rock you are looking at and write a detailed description of what the rocks looks like (pictures are welcome). After this identify what happened to cause these changes.

Sample Number:	Jar Shaken Description:	Jar Unshaken Description:	Possible Process:

Weathering, Erosion, or Deposition?



Group Size: Pairs or Teams

Materials:

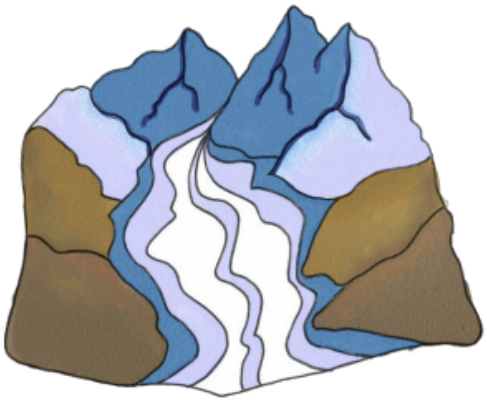
Weathering, Erosion, and Deposition definitions
Weathering, Erosion, and Deposition cards
Heading Cards and Answer Key

Directions

1. Review and discuss the meanings of weathering, erosion, and deposition. How are they alike and different?
2. Cut apart the 3 Weathering, Erosion, and Deposition heading cards with the arrows and the Answer Key. Turn the Answer Key face down and spread the heading cards out on a table in the middle of the team.
3. Cut apart the 16 the example cards. Shuffle the cards and place them face down in a pile.
4. One person flips over an example card and reads it aloud. He or she identifies the card as an example of weathering, erosion, or deposition. If everyone agrees, the card is placed face up on the appropriate heading card, right under the arrow. If some team members don't agree, review the meanings of these three terms and think about which term best describes the example on the card.
5. The next person flips over another example card and follows the directions in Step 3. Continue taking turns until all example cards are placed below a heading card.
6. Turn over the answer key and check your answers.

Weathering

The breaking down or disintegration of substances such as rocks and minerals by physical, chemical, or biological processes

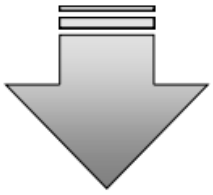
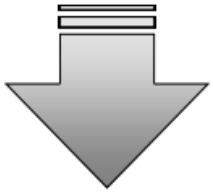
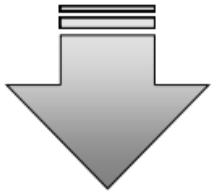


Erosion

The movement of sediment or soil from one location to another by means of water, ice, or wind

Deposition

When particles carried by water, ice, or wind are deposited (dropped) in another location

Weathering 	**Erosion** 
Deposition 	**Answer Key** Weathering 1, 7, 9, 11, 12, 14 Erosion 2, 4, 10, 13, 16 Deposition 3, 5, 6, 8, 15

Weathering, Erosion, or Deposition?

1 Flood water pounding against a canyon wall and wearing it down	2 Rain washing away soil from a hillside
3 Layers of sediment forming at the bottom of the ocean	4 A mudslide flowing down a steep hill
5 Glaciers dropping rock and sand to form terminal moraines	6 Waves dropping sand on the beach
7 Caves being formed by acid rain dissolving underground limestone	8 Deltas forming at the mouths of rivers

Weathering, Erosion, or Deposition?

9 Water getting into cracks, freezing, and breaking the rocks or pavement apart	10 Wind blowing sand from one location to another
11 Wind blasting sand at rock and carving out arches	12 Glaciers scraping rocks across the earth's surface
13 Muddy water being carried away by a fast-moving river	14 Rocks being made smooth by tumbling across a streambed
15 Ponds filling up with sediment and becoming marshes	16 Flood waters moving soil from one location to another

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