LITTLE ROCK
Reading: Practical / Grade 4 / Forces for Weathering Erosion

Name _____

Teacher _____ Period _____

Read the following passage and answer the questions that follow.

Wind and Water:

Forces for Weathering Erosion

One day after a heavy rain you walk along a creek near your house. Suddenly you notice that part of the creek bank seems to be missing. When you bend down to examine it, you see that some of the dirt is gone. It appears to have been washed away. You are seeing weathering and erosion at work.

Weathering is a process in which rock is broken down. Erosion is a process in which the broken-down pieces of rock are carried away and left in a new place. Both weathering and erosion happen every day, all over the world. There are many forces that cause weathering and erosion, but two of the most important are wind and water.

Wind

Wind is a powerful force that constantly reshapes Earth's surface. One way it works is by moving soil. If soil is not held down by the roots of plants, it is likely to blow away. A large amount of soil erosion happens because people clear away plants so they can plant new crops, let animals graze, or construct buildings or roads.

Another way that wind works is by weathering rock. Just the wind pushing against rock is enough to tear away very small pieces of it. Some of those are small enough to be eroded by the wind.

5 Sometimes the wind throws small pieces of rock against a bigger rock. Those small pieces of rock wear away the big rock. You may have seen pictures of oddly shaped desert rocks. These rock formations were <u>sculpted</u> by the wind blowing sand and small rocks against big rocks.

Water

Water is another powerful force that causes weathering and erosion. It changes Earth's surface in several ways. Like wind, water can erode soil. It flows over soil and takes little pieces of the soil with it.

7 Running water can also weather and erode rock. A river will make a riverbed by weathering and eroding rock. The river carries the rock pieces and soil eroded from its banks. When it flows into a large body of water, such as an ocean, it drops the <u>sediment</u> it carries. This forms a delta— a deposit of sediment at the mouth of a river.

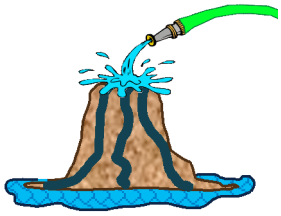
Water can drip into cracks in a rock. The water freezes in winter, and the ice gets bigger, pushing against the rocks. This makes the cracks deeper and wider. Then the ice melts in warmer weather. When it melts and runs off, it carries small pieces of the rock with it. The water will continue to melt and freeze until the rock splits.

It is hard to see erosion and weathering caused by wind and water because the process happens so slowly and with such small amounts of soil or rock. You can do an outdoor experiment, though, to see how erosion works.

Soil Erosion Experiment

Supplies needed:

- soil
- clay
- water
- a garden hose
- *a pair of gardening gloves



Instructions:

*Wear gardening gloves when handling soil.

1. Make a mountain by piling up some soil. Make it at least eight inches tall. Make the sides and top of the mountain flat.
2. Use the garden hose to pour water on the top of the pile. Watch as the water erodes some of the soil.
3. Make another mountain of soil. Put a layer of clay on top. Add a thin layer of soil on top of the clay. Again pour water on the mountain. Observe as the water causes the thin top layer of soil to become a muddy landslide.
4. Wash your hands with soap when you are finished.

1. From the experiment, the reader can tell that the layer of clay on top of the second mountain

A. is there to make the second mountain look different.

B. is nothing like what happens on a real mountain.

C. causes the soil to become a muddy landslide.

D. allows safer handling of soil.

2. What does <u>sediment</u> mean as it is used in paragraph 7?

A. the roots of plants that hold soil in place

B. the dirt and rock carried away by a river

C. the ice formed in the tiny cracks in a rock

D. the weathering of rock by the force of wind

3. Some words in the passage are written in bold print because they are

A. supplies.

B. subheadings.

C. names of books.

D. types of deposits.

4. What is the main idea of the experiment?

A. Clay holds soil in place.

B. Making a model of erosion is easy.

C. Wear gardening gloves when handling soil.

D. Piles of soil should always be at least eight inches tall.

5. What is the **best** synonym for <u>sculpted</u> in paragraph 5?

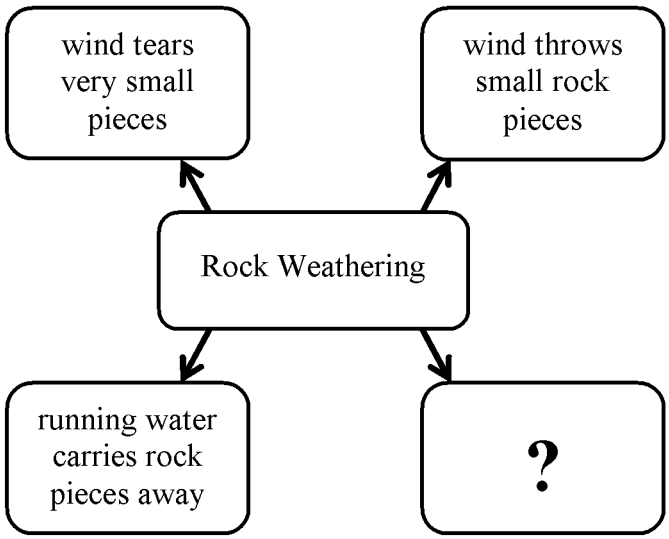
A. carved

B. flowed

C. stopped

D. watched

6. Which **best** completes the graphic organizer?



A. roads and buildings constructed

B. water freezes in rock cracks

C. people clear away plants

D. animals graze

7. Which sequence **best** explains freezing water weathering?

A. ice pushes against rock, water freezes, cracks get deeper, water drips into cracks in a rock

B. water freezes, ice pushes against rock, cracks get deeper, water drips into cracks in a rock

C. cracks get deeper, water drips into cracks in a rock, ice pushes against rock, water freezes

D. water drips into cracks in a rock, water freezes, ice pushes against rock, cracks get deeper

8. According to the passage, sediment

A. sculpts rock formations.

B. constructs buildings or roads.

C. is dropped at the mouth of a river.

D. happens every day, all over the world.

9. Wind and water are alike because they can both

A. blow small rocks against big ones.

B. move dirt and rocks.

C. cause freezing.

D. form deltas.

10. The first page of the passage is written to

A. summarize the experiment.

B. help the reader complete a task.

C. compare and contrast fiction and nonfiction.

D. compare and contrast wind and water as forces of erosion.

11. The experiment includes

A. ways to protect your hands.

B. three different ways to observe erosion.

C. ideas that must be observed over several weeks.

D. materials that can only be used in a science classroom.

READING OPEN-RESPONSE ITEM A

A. 1. Tell one way that the forces of wind and water are alike. Use information from the passage to support it.

2. Tell one way the two forces are different. Use information from the passage to support your response.

BE SURE TO LABEL YOUR RESPONSES 1 AND 2.

A

RUBRIC FOR READING OPEN-RESPONSE ITEM A (NO STANDARD)

A.

1. Tell one way that the forces of wind and water are alike. Use information from the passage to support it.
2. Tell one way the two forces are different. Use information from the passage to support your response.

BE SURE TO LABEL YOUR RESPONSES 1 AND 2.

Score	Description
4	The response tells one way the forces of wind and water are alike and one way they are different. Details from the passage are used as support for the similarity and for the difference.
3	The response tells one way the forces of wind and water are alike and one way they are different. Information from the passage is used as support for one of the ideas. OR The response tells one way the forces of wind and water are alike or different. Information from the passage is included for support of both the similarity and the difference.
2	The response tells one way the forces of wind and water are alike. It includes information from the passage for support. OR The response tells one way the forces are different. It includes support. OR The response includes details from the passage as support for a similarity and a difference.
1	The response tells one way the forces of wind and water are alike or one way they are different. There are no details from the passage for support. OR The response includes information from the passage for support of an explanation or shows minimal understanding.
0	The response is totally incorrect or irrelevant. There is no evidence that the student understands the task, or the response may be off-topic.
B	Blank—No Response. (No attempt to answer the item. Score of "0" assigned for the item.)

Possible Response Information:

Note: Some details from the passage could support either similarities or differences.

Similarities:

- powerful forces
- move dirt and rocks
- can push rocks

Support:

- responsible for creating geologic features such as sculpted rock formations and riverbeds
- wind pushes against rock from the outside, water pushes from inside cracks in the rock by freezing

- wind blows dirt away
- water carries rock pieces away

Differences:

- wind blows stuff around; water flows away with it
- wind blows small rocks against big ones
- water freezes in rock cracks, pushes against it, breaks off small pieces, and runs off with them

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Answer Key and Alignment

Answer		Source	Core Reading Skill	SLE	CC-Standard
1.	C	TLI	Inference	R.9.4.9	RI.4.3(B)
2.	B	TLI	Vocabulary	R.11.4.1	RI.4.4
3.	B	TLI	Text Features	R.10.4.8	RI.4.7(A)
4.	B	TLI	Main Idea	R.9.4.12	RI.4.2(A)
5.	A	TLI	Vocabulary	R.11.4.1	RI.4.4
6.	B	TLI	Graphic Organizers	R.10.4.6	RI.4.2(B)
7.	D	TLI	Sequencing	R.9.4.1	RI.4.3(C)
8.	C	TLI	Article Details	R.9.4.5	RI.4.1(A)
9.	B	TLI	Comparison/Contrast	R.10.4.8	RI.4.8
10.	D	TLI	Text Features	R.10.4.9	RI.4.8
11.	A	TLI	Article Details	R.10.4.19	RI.4.3(A)