Washington State Parks and Recreation Commission

Mount St. Helen's Visitor Center: Teacher Resources 2016

Visiting a Volcano:

Grades 3-5 building activity sheet

Time Commitment: 35-40 minutes
Location: Mount St. Helens Visitor Center
Site: Exhibit

The purpose of this worksheet is so that students will be able to follow the displays inside of the visitor center. Students will be able to understand the formation of Mt. St. Helens and understand the impacts of the May 18th 1980 eruption. The students will be best served by looking at the exhibits and film to get a better grasp on the information regarding the eruption of Mount St. Helens.

Goal: the student will be able to understand how plate tectonics form stratovolcanoes like Mount St. Helens and the impacts it has on the surrounding environment.

Objectives:

1) Students will be able to use the scientific method to draw a reasonable conclusion
2) Students will be able to compare and contrast information.
3) Students will be able to read informational text and find the main ideas and infer relationships between what they see around them and the text.

Next Generation Science Standards:

3-LS4-3: Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

- Describe how certain adaptations can benefit an organism in a volcanic environment.

3-LS4-4: Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

- Explain why certain organisms were able to survive in a volcanic eruption.

4-ESS1-1: Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

- Describe the formation of a stratovolcano and its characteristics.
- Detail the various eruptions of the volcano and the changes to it over time.
- Describe the changes to the mountain during, before and after the eruption and the impacts that those changes had on the surrounding environment.

5-LS2-1: Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

- Explain the differences between soil and eruption layers and how the soil is a better substrate for plant growth.

Common Core Standards:

CCSS.ELA-Literacy.RI.3.1
Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

CCSS.ELA-Literacy.RI.3.2
Determine the main idea of a text; recount the key details and explain how they support the main idea.

CCSS.ELA-Literacy.RI.3.3
Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

CCSS.ELA-Literacy.RI.4.1
Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

CCSS.ELA-Literacy.RI.4.2
Determine the main idea of a text and explain how it is supported by key details; summarize the text.

CCSS.ELA-Literacy.RI.4.3
Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

CCSS.ELA-Literacy.RI.5.1
Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

CCSS.ELA-Literacy.RI.5.2
Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.

CCSS.ELA-Literacy.RI.5.3
Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.

– Answer Key –

Visiting a Volcano:

Welcome to the Mount St. Helens Visitor Center, use the displays in the center to help you find the answers and solve the case about the volcano.

Mission: using the case clues to find out how and why Mount St. Helens erupted.

Clues:

1. Mount St. Helens is a stratovolcano, which means it is made in layers where each eruption sits on top of the previous. It is like a layered cake where the frosting and cake are stacked on top of each other.

2. The magma chamber underneath the mountain is filled with molten Dacite rocks which have a huge amount of gas bubbles floating around inside of it. That gas makes very explosive eruptions.

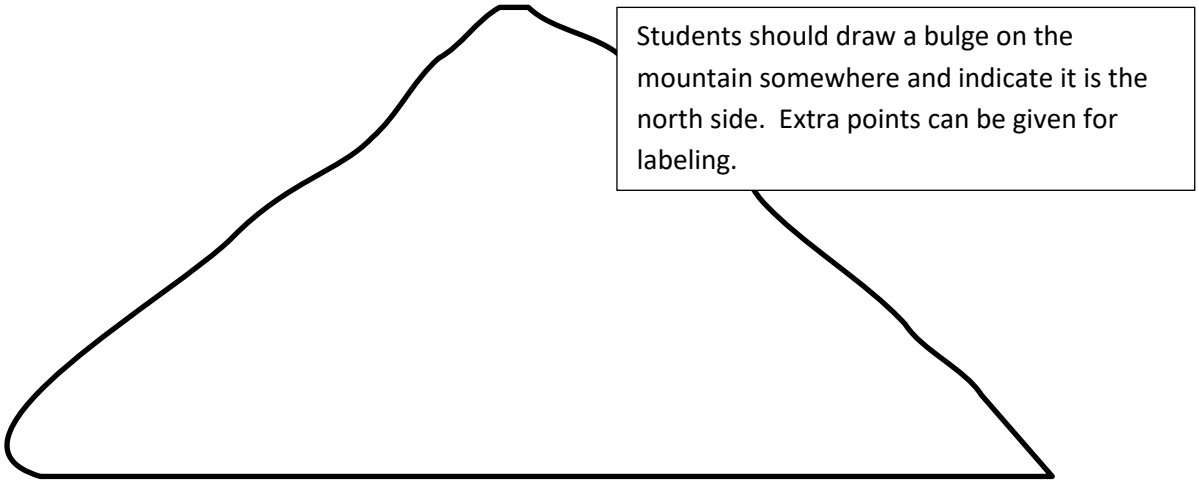
3. Mount St. Helens is the youngest/smallest but most active of the volcanoes in the Cascade Range. The cascade range of volcanoes stretches from northern California to southern Canada.

1. While looking at the displays about plate tectonics and how volcanoes form, finish the sentences by filling in the blanks with the correct word(s) using the information that you learned.
   a. Approximately 200 million years ago, this great Continent split into Pieces/plates and shifted to their present locations.
   b. These plates move anywhere from 1/2-7 inches each year.
   c. When plates move apart volcanoes fill the separating edges.
   d. More than 90% of the earth's volcanoes on landform above areas where one plate dives beneath another. These areas are known as Subduction Zones.
   e. About 75 miles beneath your feet, rocks along the subduction zone Partially Melt forming Magma.
   f. As a mixture of Liquid rock, tiny Crystals, and dissolved gas, magma Rises because it is Lighter than surrounding rock.
   g. The Juan De Fuca plate plunges about 1 inch per year beneath the North American Plate.
2. List some of the activities and places that were common for visitors to do/see around Mount St. Helens and Spirit Lake prior to 1980
   a. Answers can include: Hiking, swimming, fishing, camping, skiing, mining, logging, climbing, wildlife watching, & use by Native Americans.
   b. _____
   c. _____

3. Based on what you know about volcanic eruptions, assess how a volcano erupting might effect one of the activities or places you listed above.

   Answers can include: destroyed the area, or changed the landscape, and that some areas are not yet recovered enough to do those activities again.

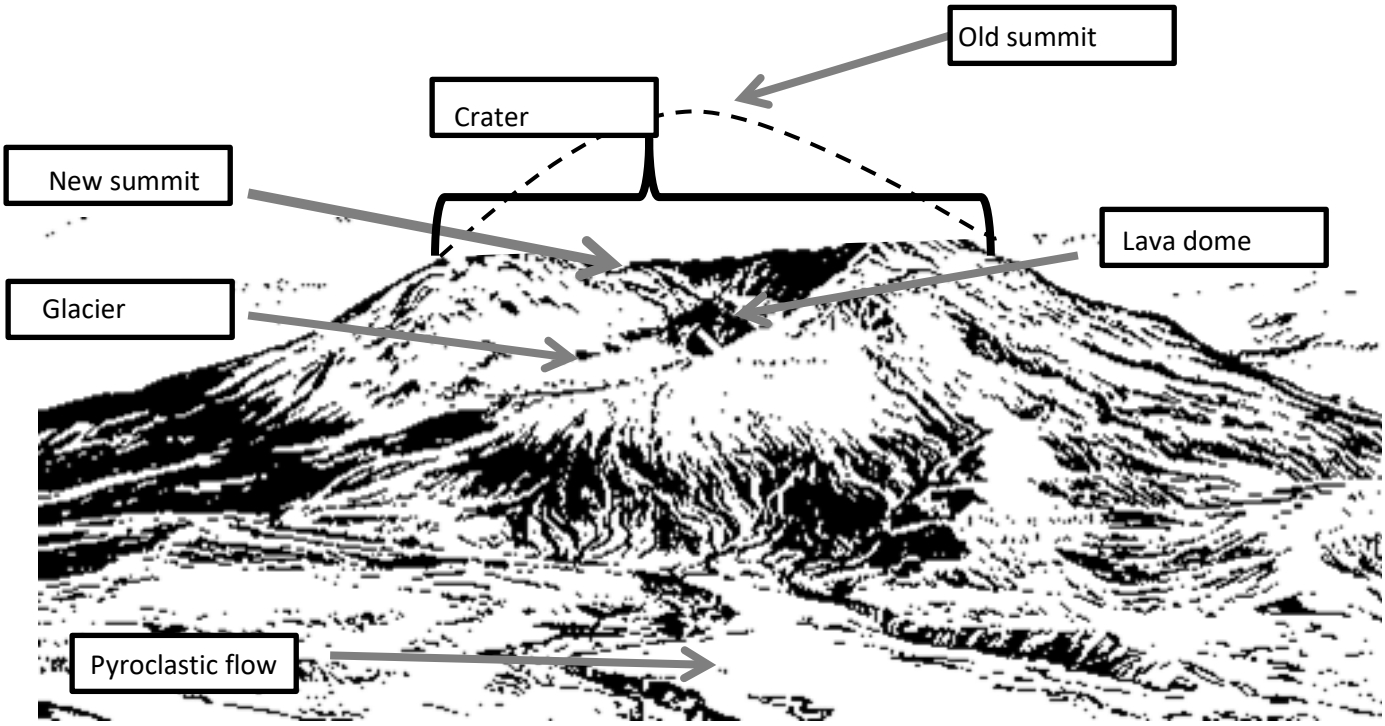
4. Below, draw the changes seen on Mount St. Helens during April 30th to May 17th and describe why that may have caused the eruption of 1980 to be so destructive.



Answers should include information about the "Bulge" forming and how it could form a landslide /avalanche. Students should also conclude that the movement of the "bulge" caused the directed/lateral blast.

5. On the picture label each part of the volcano using the word bank below.

Crater **Current Summit** **Lava Dome** **Pyroclastic Flow** **Glacier** **Old Summit**



6. Looking at the ash plume display, list the eruptions by size and write the amount of ejecta for each eruption below:

1. Mount Mazama – 150 km^3 (4850 BC)
2. Tamboura – 80 km^3 (1815)
3. Mt. Katmai – 30 km^3 (1912)
4. Krakatoa – 20 km^3 (1883)
5. Vesuvius – 9 km^3 (79 AD)
6. Mt. St. Helens – 4 km^3 (1900)
7. Mt. St. Helens – 1 km^3 (1500/1980)
8. Mt. St. Helens – 1 km^3 (1500/1980)

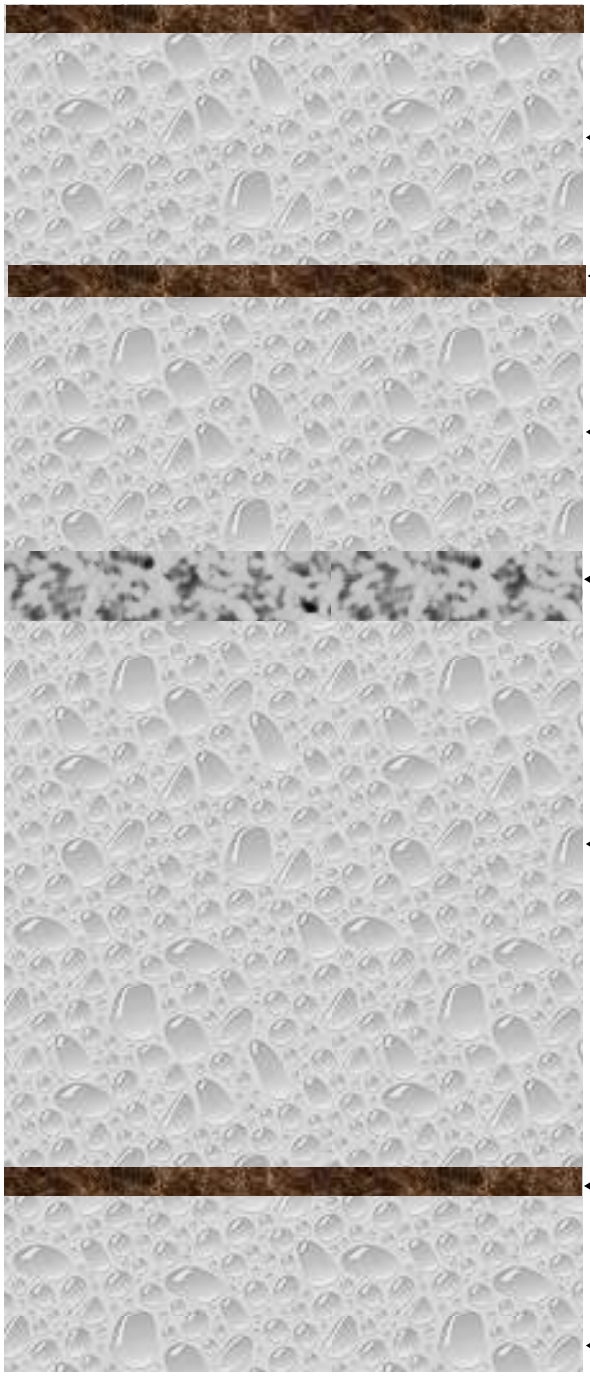
7. Using the information from above, compare the size of the eruption of Mount St. Helens in 1980 to the eruption of other volcanoes by the amount of ejecta produced.

Answers should include evidence from the list and that it is smallest or second smallest

8. How does the 1980 eruption compare to the other eruptions listed for Mount St. Helens on the ash plume display?

Answers should be: smallest or second smallest eruption by size.

9. As you look at the “Layers of the Mountain” you can see the history of Mount St. Helens, as a land constantly changing. Looking at the display correctly label the drawing below with the dates and a short description of what that the layer represents.



May 18, 1980: Grey Dacite erupted first then frothy pumice covered creating a double layer look.

AD 1800-1980: forest flourished.

AD 1800: Explosive event, same amount of pumice as 1980

AD 1489-1566: Small explosive events

AD 1480: Largest eruption in last 3,000 years, ash spread 250 miles or more.

AD 950-1480: forests thrived.

AD 750-950: charcoal=trees destroyed, lateral blast

10. Look at the “Survivors of the Blast” display and in the table below provide an example of a survivor of the blast and the feature that allowed them to survive.

Type of Survivor	**Feature that helped them survive**	**How they survived the blast**
Pocket gopher	Burrowing	Being in burrow
Ant	Underground living	Being home
Salamander	Hibernating	Hibernating in winter
Plant	Living underground/double roots	Not having sprouted yet/one set of roots survive
Fish	Under ice	Ponds/lakes under ice
Tree roots	Double roots	Covered by soil and snow

– End Answer Key –

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5. While looking at the displays about plate tectonics and how volcanoes form, finish the sentences by filling in the blanks with the correct word(s) using the information that you learned.
   h. Approximately 200 million years ago, this great _____ split into _____ and shifted to their present locations.
   i. These plates move anywhere from _____each year.
   j. When plates move _____ volcanoes fill the separating edges.
   k. More than _____ of the earth's volcanoes on landform above areas where one plate dives beneath another. These areas are known as _____.
   l. About _____beneath your feet, rocks along the subduction zone _____ forming _____.
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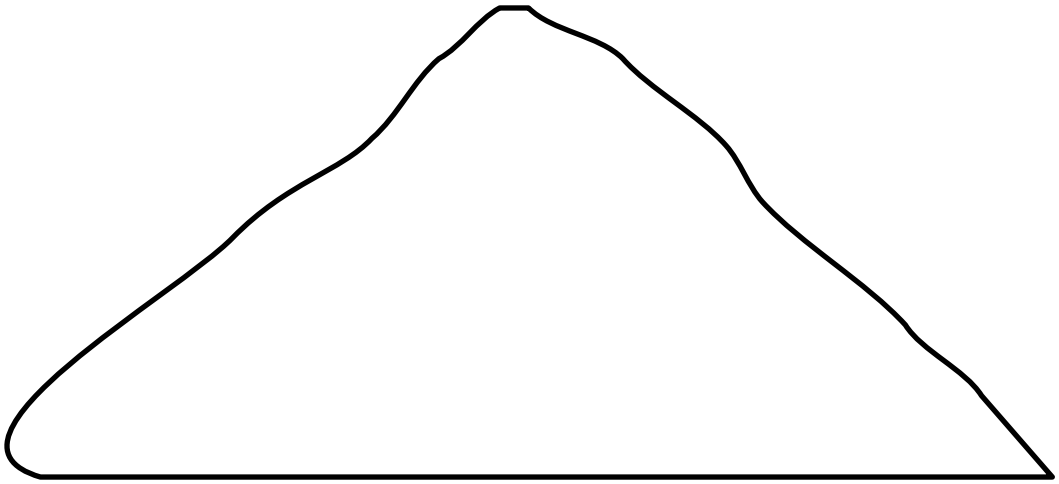

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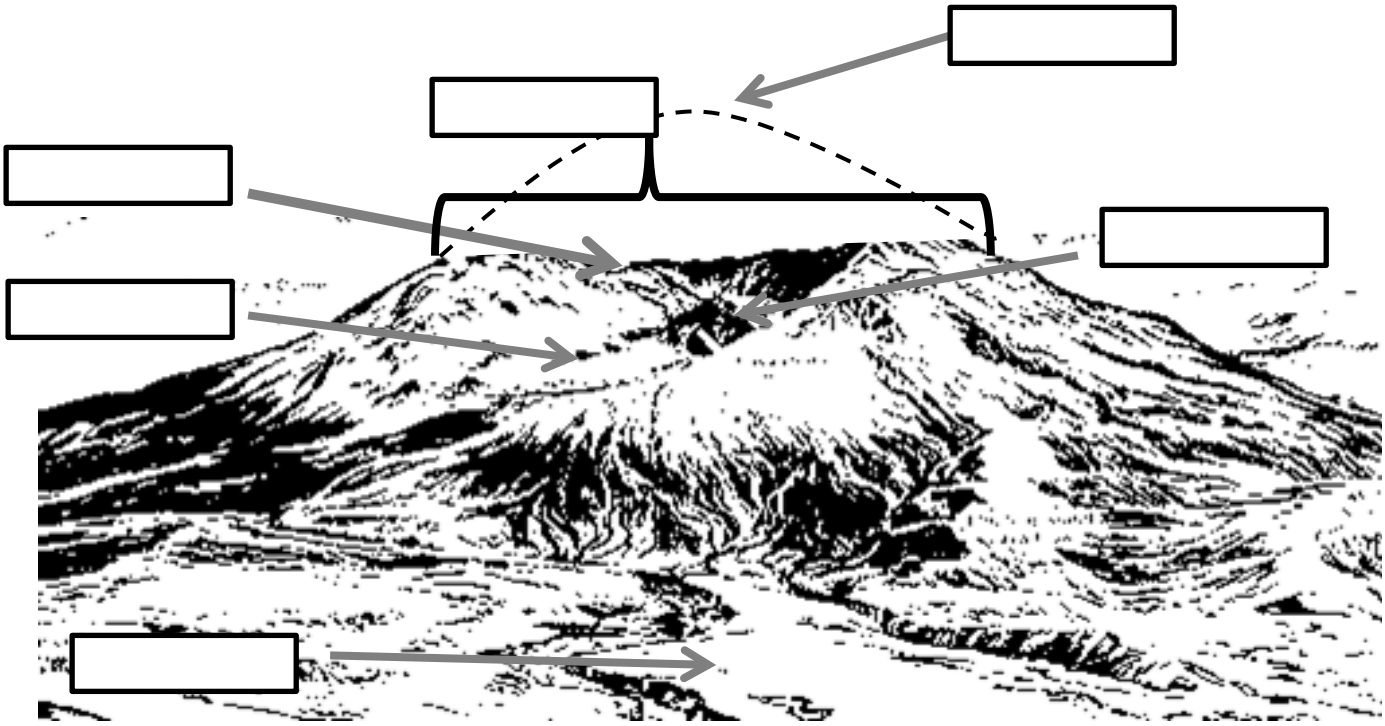

8. Looking at the ash plume display, list the eruptions by size and write the amount of ejecta for each eruption below:

1. _____ 5. _____
2. _____ 6. _____
3. _____ 7. _____
4. _____ 8. _____

7. Using the information from above, compare the size of the eruption of Mount St. Helens in 1980 to the eruption of other volcanoes by the amount of ejecta produced.

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9. How does the 1980 eruption compare to the other eruptions listed for Mount St. Helens on the ash plume display?

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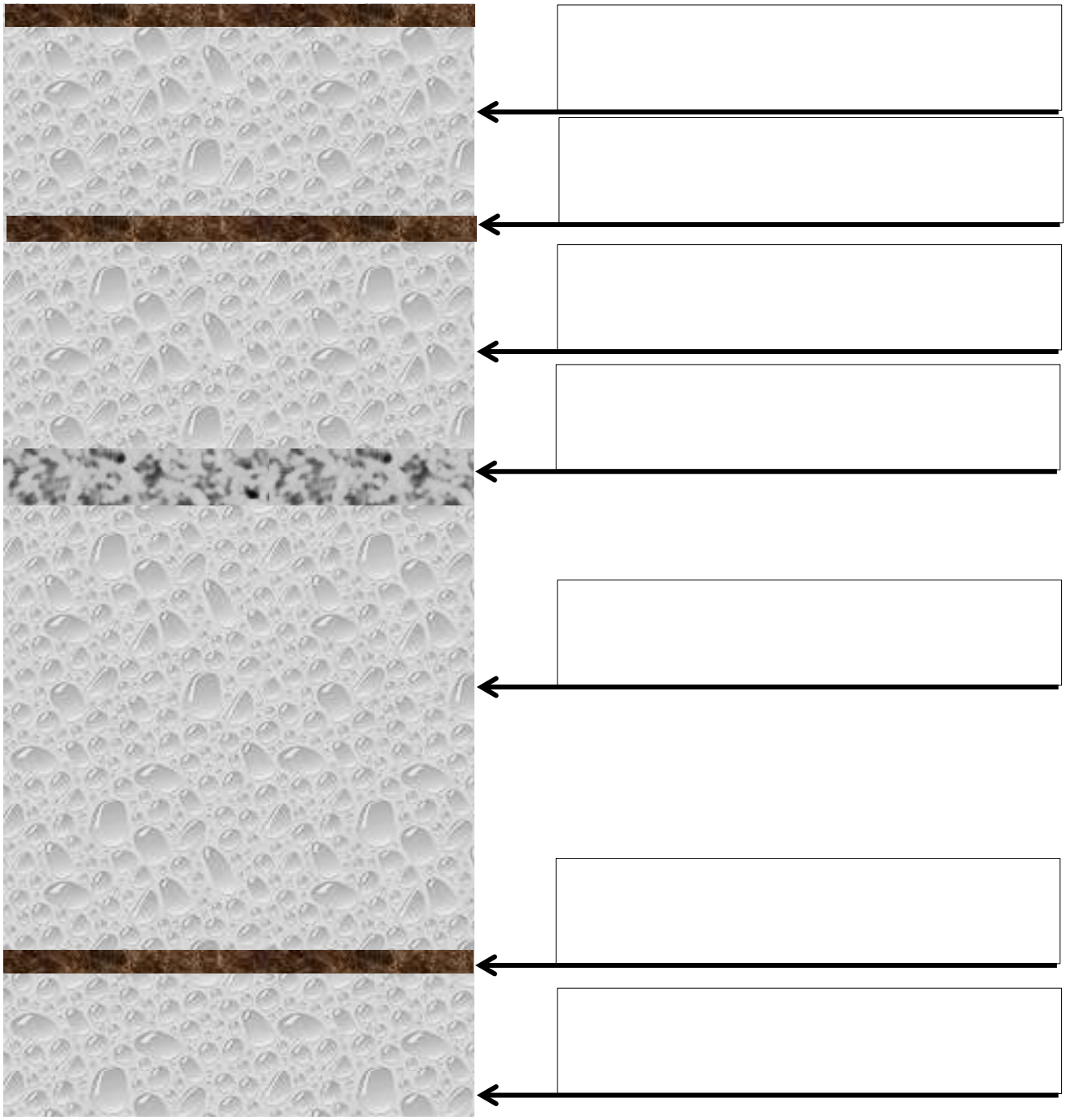

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