7th Grade Homework – Unit 3 - Ecology - Mt. St. Helens Case Study

Name_____ Class period _____

Completion Grade _____ / 6 = _____% Final Grade (Correctness) _____ / **35** = _____%

During this homework assignment, you will use the eruption of Mount St. Helens in Washington, United States, as a case study to help you understand the various aspects of ecology. As you learned in the previous unit, the volcanic eruption of Mount St. Helens was the largest in the history of the continental United States. Apply what you learn throughout this unit to analyze the eruption, its causes, its effects on the local ecosystems, and the various ways in which the Mount St. Helens region is slowly rebuilding itself through a process called *succession*.

**You CAN use your notes to help you with your homework. You can also use the suggested helpful links located throughout the packet to help you as well. However, you should NOT use Google (or your friends ☺) because this packet is designed to help Mrs. Weimer and Mrs. Langley understand how YOU interpret information.

Please ask Mrs. Weimer or Mrs. Langley for help if you need it!

Homework will be assigned on Tuesday, November 8, 2016 and will be due by **Tuesday, December 6, 2016.** There will be a homework check-in on Tuesday, November 22, 2016. At this point, students will be required to have (any) 3 of the 6 activities completed by that point.

Activities are:

_____ 1. *New York Times* article from May 18, 1980 – read and 4 questions
_____ 2. Mapping the Devastation – color the map and 1 question
_____ 3. Climate Graphs – complete the graph with labels and title and 2 questions
_____ 4. Succession of Mount St. Helens excerpt and survivors chart– read and highlight 3 key details
_____ 5. Mount St. Helens Food Web – label 4 trophic levels and 3 questions
_____ 6. Succession Progression Cartoon – put it all together – must have all 8 boxes filled

****PLEASE READ THE DIRECTIONS FOR EACH ACTIVITY CAREFULLY. ****

At Least 8 Dead as Peak Erupts; Worst Blast Yet

Mount St. Helens Throws Mud and Column of Ash

By Wallace Turner

Special to The New York Times - http://www.nytimes.com/learning/general/onthisday/big/0518.html#article


"All the News That's Fit to Print"

The New York Times

LATE CITY EDITION

NEW YORK, MONDAY, MAY 19, 1980

ALLIES WILL IMPOSE LIMITED SANCTIONS ON IRAN THURSDAY

BAN ON CONTRACTS APPROVED

Pacts Made After Hostage Seizur Are Affected — Step Is Called 'Meaningful' in Washington

At Least 8 Dead As Peak Erupts; Worst Blast Yet

Mount St. Helens Throws Mud and Column of Ash

14 DIE IN MIAMI RIOT; ARSON AND LOOTING PERSIST FOR 2D DAY

TOLL OF INJURED EXCEEDS 200

Violence in Black Neighborhoods Follows Acquittal of 4 Whites Accused in Fatal Beating

New York Bus Shelter Case: Business, Law and Politics

ANGER LONG IN RISING AMONG MIAMI BLACKS

Leaders Cite Other Brutality Cases and the New Influx of Cubans

Public Workers' Pensions Strain Cities and Increase With Inflation

The Pension Tangle

INSIDE

For One Love Canal Family, the Road to Despair

Vancouver, Wash., May 18, 1980 -- Mount St. Helens exploded at 8:39 A.M. today with a thud felt 100 miles away and with a drifting column of steam and pumice that turned day into night. At least eight people lost their lives fleeing flood waters, fires and mudslides that hit the Toutle River valley shortly after the volcano's eruption.

David Hubert, a spokesman for the Washington Department of Emergency Services, said that police officers working from helicopters had found some of the dead. "We have many overturned vehicles in the Toutle River valley," he said, "and our communication with the helicopters is so fragile that all I can tell you is that we have found five bodies." Two of them, found at a Weyerhaeuser Company logging camp near the mountain were flown to Kelso, Wash., by a helicopter of the Air Force reserve.

A helicopter pilot saw three persons in a pickup truck down in floodwaters near the town of Toutle. It was not known where officials had found the eighth body.

A hot ash flowed down the peak; mud and logs flowed down the river. "I could hear it crackling from by house," Tom Huntington said. At 9:30 A.M., he said, the river was "wall-to-wall logs."

Earlier Eruptions Dwarfed

The earlier ash and steam eruptions this year were dwarfed today, but it is not clear whether lava was being expelled in the absence of a lava eruption, the major worries were drifting ash, which is hazardous to crops, water supplies and health; forest fires, and flash floods resulting from melting glaciers.

Minutes before the top of the 9,677-foot peak exploded with a shower of ash, two earthquakes registering about 5.0 on the Richter scale were recorded. Their impact was felt as far away as Port Angeles at the entrance to Puget Sound.

Within hours after the pillar of ash rose to a height measured by radar at 60,000 feet, wind had pushed it 160 miles east to Walla Walla, Wash., where automatic equipment turned on street lights as if dusk had come.

Elsewhere in Washington, the low visibility resulting from the snowstorm of gritty ash

may have led to the death of a crop-dusting plane's pilot. His plane crashed into a power line near Teanaway, according to Kittitas County Sheriff Bob Barret.

The eruption came from the old summit crater and a vent on a north side of the peak. It made a roar "like a truck," according to Greg Meyer, who was fishing at Mosquito Lakes about 40 miles east of Mount St. Helens.

The black cloud, carried by the highlevel winds that blow from west to east at this time of year, was carried over the lake with pumice falling from it, he said. His visibility was cut to between six and 10 feet. Mr. Meyer abandoned his fishing equipment and canoe.

Almost all residents of the sparsely settled area high on the mountain have been evacuated in recent weeks. About two thousand others from lower areas, such as the Toutle region, were leaving today.

Some other people were unaccounted for. One of these is Harry Truman, 84 years old, who has steadfastly refused to leave the collection of cabins that he rents to fishermen at Spirit Lake, Wash., in the most dangerous area.

The dense cloud of dust, ash and steam prevented any surface examination of the northeast shoulder, where a bulge has grown over the last several weeks at a rate that caused scientists to believe that a lava eruption was possible.

Scientists who have monitored steam from vents on the peak found no increase in sulfur dioxide, one measure of build-up that would lead to lava eruption. They said today that they could not confirm that any lava had appeared.

Answer the following questions about this article:

1. (Cause/Effect) List THREE events that happened AFTER (because of) the eruption.

   1.

   2.

   3.

2. (Recalling Facts) What hints did scientists have that an eruption of Mt. St. Helens was coming?

   1.

   2.

   3.

3. (Recalling Facts) What steps did local authorities take to insure the safety of the people in the area?

4. (Making Inferences) Based on what you've read in this article, what do you think would be one major impact that this eruption had on the ecosystem surrounding Mt. St. Helens? _____

_____

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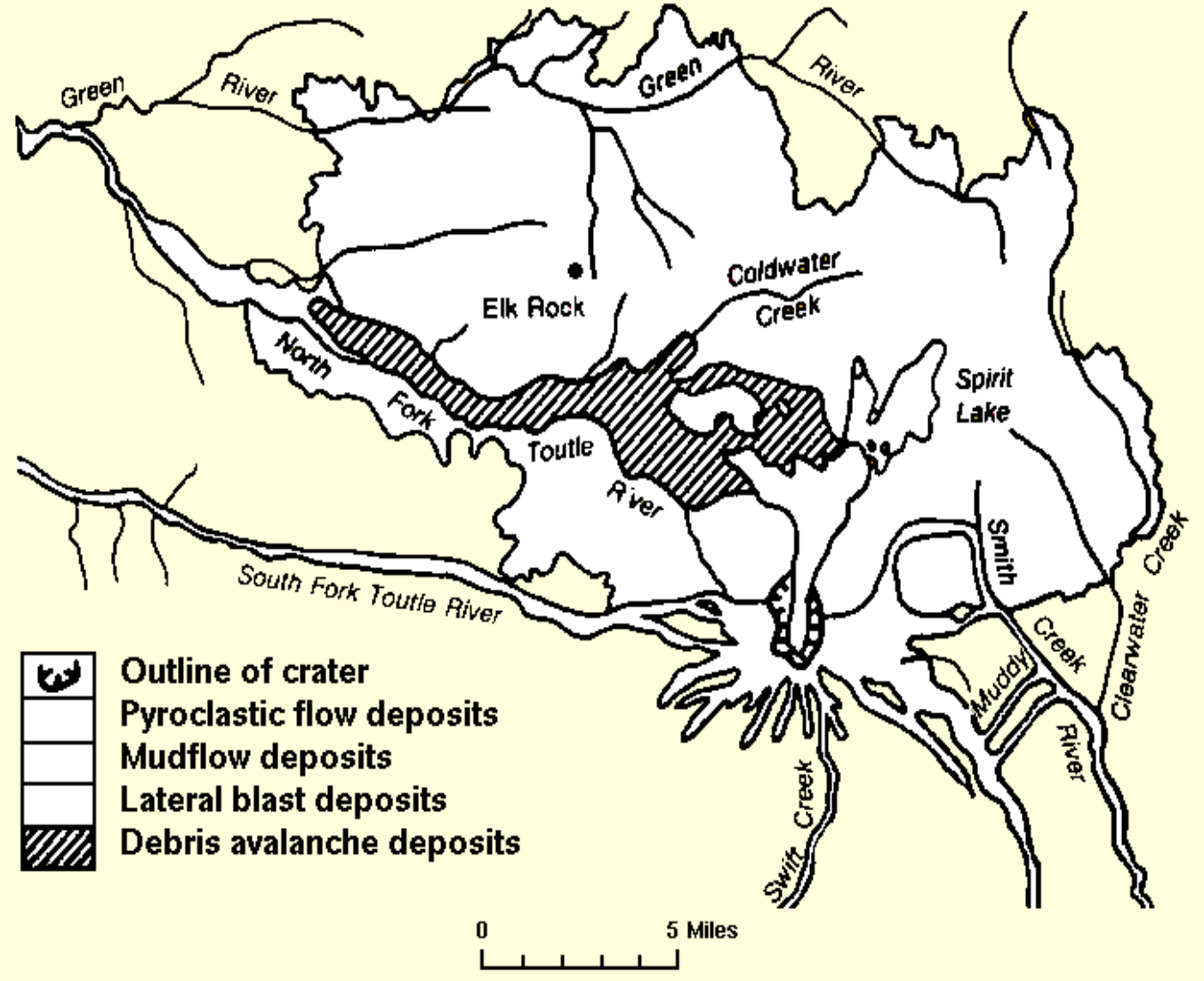
✓_____ Grade _____/ 4

Mapping the Devastation

Look at the map of the area near Mount St. Helens. Color the areas (by number) based on the key at the bottom of the map. Then, answer the question.



**If you are struggling with this, ask Mrs. Weimer and/or Mrs. Langley during Homework Check-in time OR check out this handy, dandy resource as a guide: http://www.fs.fed.us/pnw/mtsthelens/maps/

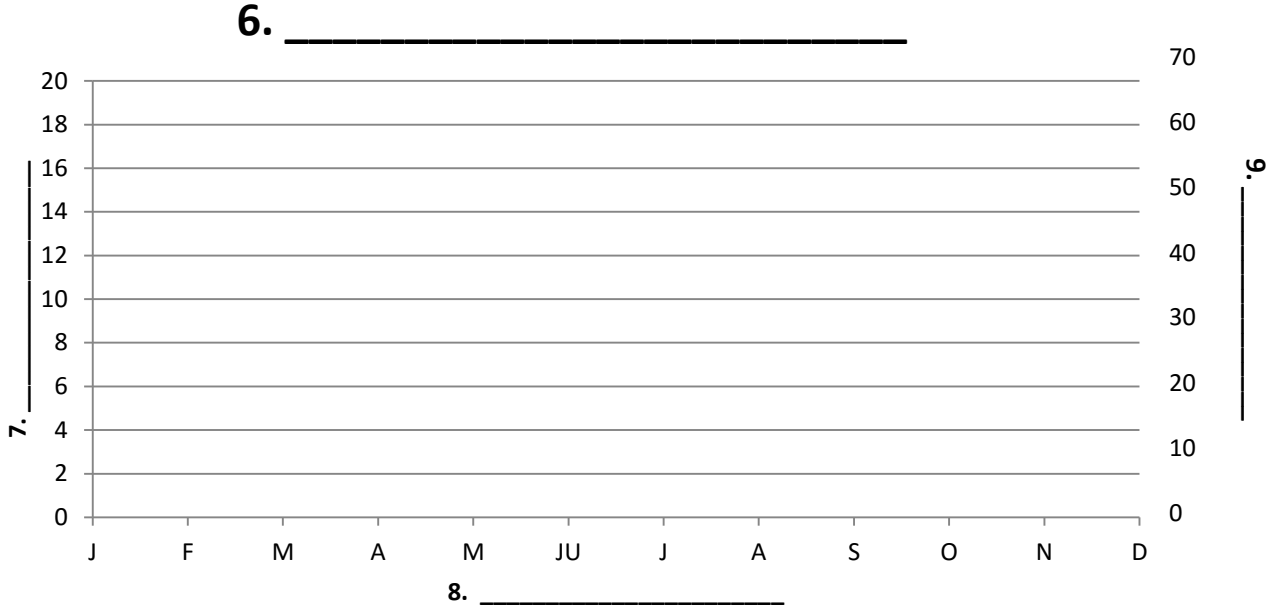
5. (Interpretation) What types of ecosystems were affected by the volcanic eruption? How were each affected?

✓_____ Grade _____/ 6

Climate Graphs (a.k.a. Climographs or Climatographs)

Below is climate data from the Mount St. Helens region. Transfer the data from the table into the climate graph. Then, answer the questions below.

	J	F	M	A	M	JU	J	A	S	O	N	D
Average Precipitation (in inches)	**17**	**15**	**12**	**9**	**5**	**4**	**2**	**2**	**4**	**8**	**18**	**19**
Average Temperature (in degrees Fahrenheit)	**38**	**41**	**44**	**49**	**55**	**60**	**66**	**66**	**62**	**53**	**44**	**38**



**If you are struggling with this, ask Mrs. Weimer and/or Mrs. Langley during Homework Check-in time OR watch this super-helpful video: https://www.youtube.com/watch?v=Wv6yHl0LpgM

10. (Data Analysis) Based on the data in the climate graph, what months are considered the wet season? Which are considered the dry season?

11. (Making Predictions) How might the climate in this region during the time of the eruption potentially help or hurt the local ecosystem after a volcanic eruption?

✓_____ Grade _____/ 7

Succession of Mount St. Helens

Excerpt modified from "Mount St. Helens – A Story of Succession" by Project Learning Tree and the American Forest Foundation

https://www.plt.org/stuff/contentmgr/files/1/47089543432aae6ee76a2c1d9fd698cf/files/focus_on_forests_activity_2_sp_1_mount_st_helens.pdf

As you read this excerpt and the table of survivors on the next page, highlight 3 SPECIFIC details you think were important to the succession of the Mount St. Helens region. These details will be used for questions later and for your comic strip at the end.

Mount St. Helens before (left) and after (right) the eruption of May 18, 1980. Picture taken from: http://www.pbs.org/newshour/rundown/lessons-learned-35-years-since-1980-eruption-mount-st-helens/

What is Succession? Succession is the process by which plants or animals in a community (ecosystem) begin to re-establish an area after a disaster of some sort (i.e. volcanic eruption, forest fire, etc.) or a time of limited growth.

On May 18, 1990, the Mount St. Helens volcano, located in North-east portion of the United States in the state of Washington, violently erupted after a series of earthquakes and weaker eruptions that had lasted for approximately two months. The eruption caused a 300 mile-per-hour lateral (from the side) blast of hot air and debris (including pyroclastic material) that leveled 230 square miles of nearby forest, lakes, streams, and meadows. The ash cloud reached 80,000 feet in the first fifteen minutes following the eruption. The ash cloud was then noted to affect areas around the globe for the next fifteen days.

Despite this mass destruction, some parts of the local ecosystem surrounding Mount St. Helens survived. However, scientist who have been studying the succession of plants and animals in this region believe it will take several hundred years before the area is similar to what it was before the eruption, which can also be known as reclamation (the act of returning land to a former state – this can happen naturally or with human intervention). The table below shows the growth rate of plants in the area:

Years After the Eruption	Percentage of Regrowth/Plant Coverage
3 years	1%
14 years	38%
20 years	66%

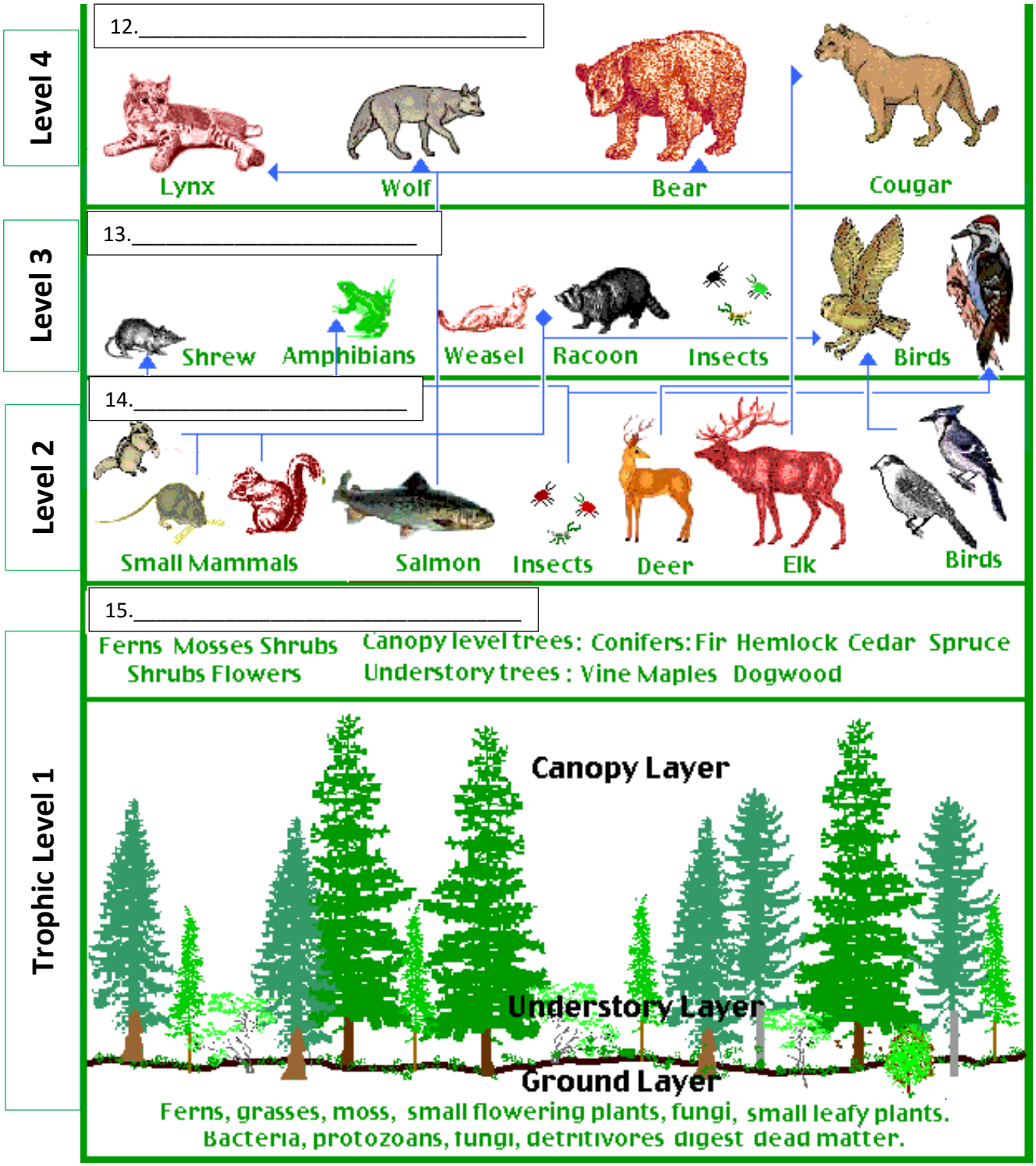
How did they do it? Tales of Survival

Survivor	Picture	Method of Survival
Animal - Pocket Gophers		Pocket Gophers live in underground burrows and eat mostly roots and tubers, which are also found underground.
Animal – Fish (various species)	 Trout	At the time of the eruption, most of the nearby lakes were still frozen from the winter. Many species of fish survived the head from the blast and were not affected by poor water quality for some weeks.
Animal - Salamanders	 Redback Salamander	Salamanders hibernate underground and many species of salamanders were still in a state of hibernation during the eruption.
Plant – Lupines**		Some patches of lupines were not badly damaged by the eruption. When the process of succession started, lupines (whose seeds are spread by the wind) were one of the first species of plants to begin to grow back. Same for Fireweed and Pearly Everlasting – also flowers – whose seeds were blown from surrounding areas.
Plant – Pacific Silver Fir		In some areas, these trees (including others like the Mountain Hemlock and lower trees like the willow and vine maple) had roots that were snow-covered at the time of the eruption. Therefore, when the snow thawed, these trees were able to regrow from their undamaged roots.
Plant – Red Alder**	 Western hemlock in a stand of red alder	Much like the Pacific Silver Fir and other trees, the Red Alder was able to reestablish itself from its roots. However, unlike other trees, red alders are very fast-growing, so the red alder has become the predominant (most seen) tree in the area around Mount St. Helens.

✓_____ Grade _____/ 3

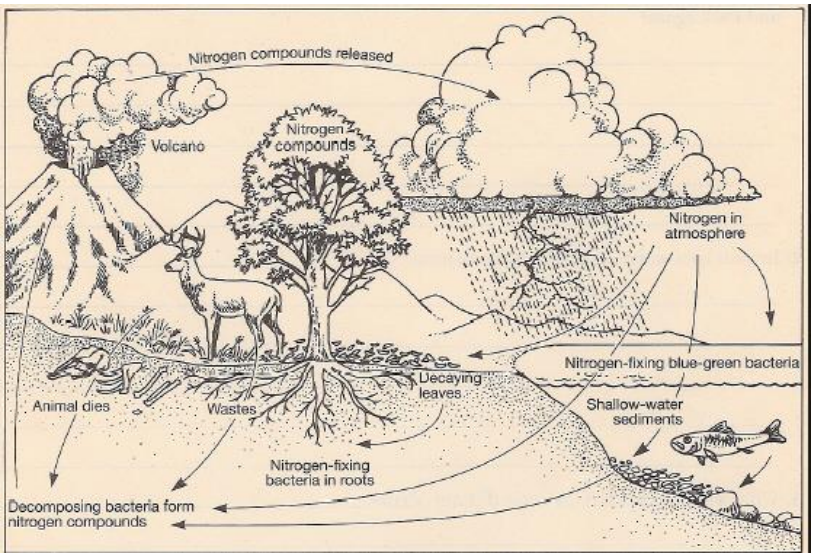
Mt. St. Helens Region Food Web

Label each layer of the food web. Then, answer the questions on the next page using the map and the food web to help you.



16. (Analysis) The eruption of Mount St. Helens leveled the majority of the canopy layer trees. How would a loss of canopy layer trees in trophic level 1 affect the understory and ground layer plants? (Hint: Think about what the plants DO for each other and why they grow how/where they do.)

17. (Analysis) In the aftermath of the eruption, acres of canopy layer trees that had been blown down were carried by mudslides to the rivers. These rivers then carried the logs downstream. Think about the Nitrogen Cycle and explain how both the volcanic eruption and its damage (including the logs) could have helped with succession. Look at this graphic to help with your answer:



18. (Inferences) Based on what you've learned or what you can infer from the information in this unit, list at least three other factors that could have contributed to the succession of the Mount St. Helens region.

✓_____ Grade _____/ 7

Succession Progression Cartoon

In each box, draw a picture, color it, and write a brief description of the process of succession in the Mount St. Helens region. Begin with the eruption of the volcano in box 1. Include information from your reading, the charts, tables, maps, and graphics (as well as your ideas).

1	**2**
3	**4**
5	**6**
7	**8**

✓_____ Grade _____/ 8