

## #18: Volcanism and Ash

name:

### VOLCANIC ASH

Go to <http://formontana.net> and then click on picture # 6.

1. This photo was taken along the road to York (near Helena). What is the distinct white layer made of?
2. How do scientists know where it came from?
3. When did Mt. Mazama last erupt, and how did the volume of its ash compare to the 1980 eruption of Mt. St. Helens?
4. What was the ash before Mt. Mazama erupted?
5. What does the term “prevailing winds” mean?
6. Explain how a caldera forms?
7. **Click on “More about Mt. Mazama”.** The painting shows what Mazama might have looked like as it was erupting 7,700 years ago. Look at the series of 4 diagrams at the bottom of this web page. Explain why the eruption(s) led to the collapse of Mazama. HINT: The crater was not caused by the explosion, but rather by something that happened soon after the eruption.

Go to <http://formontana.net> and then click on picture # 80.

8. What is the connection between the fossil rhinos in Nebraska and future geysers in Billings?

9. Explain what killed the rhinos and other animals at this location in Nebraska 12.5 million years ago?
  
10. Why were so many animals found in such a small area?
  
11. What are the two reasons that geologists think the ash came from a volcano in southwest Idaho?
  
12. Explain what a “hot spot” is.
  
13. Why is the hot spot that caused the eruption that buried the rhinos now located beneath Yellowstone Park?
  
14. How big is its magma chamber?
  
15. Why don't “supervolcanoes” have nice cone-shaped peaks?
  
16. Look at the map near the bottom of the web page. What do the numbers mean?
  
17. Toward which direction has the plate been moving over the past 12.5 million years?
  
18. What is/was Bruneau-Jarbridge?

19. Click on the Hot link titled “more about the Yellowstone Hot Spot”. Scroll down to the third image (map of Yellowstone area). Use the scale to estimate the width of the Yellowstone Caldera.
20. Scroll down to the graphic titled “Big Yellowstone Eruptions”. What is the point of this graphic? (What does it help you understand?)
21. Click on this web site: <http://formontana.net/ashfall.html>  
Look at all the pictures and read the captions. What is given as proof that the place where the rhinos died was some sort of pond or lake?
22. Click on “Learn more” on the last page of the virtual tour through the Ashfall Site. Click on “Ashfall Fossil Beds Home Page,” and then “Ashfall Geology”. Look at the photo of the ash (magnified 525 times). What does it look like, or what does it remind you of?
23. How long ago were there giant beavers in Nebraska?
24. What was the environment like in Nebraska during the time that giant salamanders lived there?
25. Click on the “Ashfall Animals” link. What time period, and what part of the USA is depicted in the painting (when and where)?
26. How many different types of mammals have been found at the Ashfall Fossil site?
27. Of these, how many were species of horses?

28. Which of the 10 animals pictured on this web page do you think is the most unusual? Explain the reason for your choice.

### **BENTONITE**

**Go back to <http://formontana.net> and then click on picture # 40.**

29. That's Mr. Benson standing just northwest of his hometown (Harlem). Find Harlem on your highway map. What reservation is the butte in the background located on?

30. What does the big rock have to do with volcanism?

31. Where did the rock come from, and how did it get into north central Montana?

32. What is the gray material that I am standing on, and what did it used to be?

33. What is unusual about the river valley in the background?

34. How did the butte in the background form?