

36. How the Ice Age Helped Shape Montana

Go to the following web site: <http://formontana.net/base.html>

name: _____

A. Select the link titled MISSOURI RIVER.

1. On the map shown on the web site, what does the **solid** (not dashed) red line mark the location of?

2. What is unusual about the Milk River Valley from Havre to Nashua? (This unusual feature suggests that the valley was not formed by the Milk River.)

3. The Missouri used to flow northeast toward Canada's Hudson Bay. Now it flows through the Dakotas, emptying into the Mississippi River near St. Louis. What caused the change?

4. Click on the Hot Link titled “*Compare the Map to an image that shows topography”. Which valley is wider? Circle one.

a. The pre-ice age Missouri Valley from Big Sandy to Havre

b. The present valley of the Missouri southeast of Big Sandy

B. Click on RETURN TO BASE CAMP. Then select the link titled HI-LINE.

5. How do geologists know that the rock in the photo was not formed in north-central Montana?

6. Rocks like this one from Canada can be seen scattered throughout north-central Montana. Why aren't rocks from Canada found south of the Missouri River?

7. What river's valley is marked #4 on the photo?

C. Click on RETURN TO BASE CAMP. Then select the link titled STRIATIONS.

8. Explain how a glacier caused the striations shown in this photo.

9. What do the scratches help geologists figure out?

10. Besides striations, what two other types of evidence help geologists figure out how far south the ice advanced during the last ice age?

D. Select the link titled ICE AGE AMERICA.

11. In which part of the United States did the ice sheet extend the farthest south?

12. This map depicts the continent as it appeared _____ years ago.

13. Was Alaska covered with ice during the ice age depicted on the map?

E. Go back to the base camp at <http://formontana.net/base.html>. Select LAKE GREAT FALLS.

14. How often has Earth experienced an ice age over the past several hundred thousand years?

15. What two factors combined to form Glacial Lake Great Falls?

16. How do geologists know how deep the lake was where the city of Great Falls sits today?

17. Scroll down to the map at the bottom of the screen. List three other glacial lakes that existed in Montana at times during the last ice age.

18. Click on the link titled **VARVES** beneath the map. Between which two larger Montana cities were the photos on this page taken?

19. What kind of sediment are the light-colored layers made of, and how did they form?

20. What kind of sediment makes up the darker layers, and why did they form in the winter?

21. How are these layers (called “varves”) like tree rings?

F. Go back to the web page titled BASE CAMP. Then select LAKE MISSOULA.

22. What caused the unusual parallel lines highlighted by snow on this Missoula mountainside?

23. Explain how a glacier caused prehistoric Glacial Lake Missoula to form.

24. What caused the waters of the lake to rush across Eastern Washington in a cataclysmic flood?

25. It is believed that the waters of Lake Missoula flooded eastern Washington many times. How long ago did these floods happen?

26. Scroll down to the map at the bottom of the screen. Where was the location of the ice dam that blocked the Clark Fork River?

G. Click on RETURN TO BASE CAMP and select the link titled FLATHEAD LAKE.

27. When the glacier reached the Mission Range it split, with one lobe flowing into the Swan Valley and the other moving toward present-day Polson. Why did the lobe that extended into the Swan Valley reach farther south?

28. What is the Polson Moraine, and how did it form?

29. Why didn't the area where Flathead Lake sits today fill with sediments as the ice age came to a close?

30. Why are moraine-dammed lakes usually short-lived?

31. Why didn't the lake drain itself as it overflowed the Polson Moraine?

H. Click on RETURN TO BASE CAMP. Then select the link titled MORaine.

32. This photo, taken 30 miles north of Missoula, shows a "lateral moraine". Where did the rock material that makes up the moraine originate?

33. Why did the glacier deposit this rock material (till) here?

34. One aspect of "till" that helps geologists identify it is that it is unsorted. What does "unsorted" sediment consist of?

35. Was this moraine formed by a continental glacier, or by a valley glacier?

I. Click on RETURN TO BASE CAMP. Then select the link titled TROUGH.

36. How can geologists tell that a glacier once flowed through this valley?

37. Why do alpine glaciers eventually stop advancing?

38. What must be true of the climate in order to an especially large "end moraine" to form?