

**Glaciers – Practice Questions and Answers**  
*Revised November 2008*

1. A glacier moves under the influence of its own weight and \_\_\_\_\_.
2. Glaciers store how much of the worlds freshwater supply?
3. Glaciers cover how much of the land surface of the Earth?
4. If all the global supply of land ice stored in glaciers melted, then how far would sea level rise?
5. Glaciers that are confined to valleys are called \_\_\_\_\_ or \_\_\_\_\_ glaciers.
6. Glaciers that cover more than 50,000 square kilometers are called
  - a. Alpine
  - b. Valley
  - c. Ice sheets
  - d. Ice caps
7. Glaciers that are not confined to valleys and cover less than 50,000 square kilometers are called
  - a. Non-valley
  - b. Valley
  - c. Ice sheets
  - d. Ice caps.
8. Can you name two continents that contain continental glaciers?
9. A continental glacier is distinguished from an alpine or valley glacier by (choose all that apply)
  - a. Size – they exceed 50,000 square kilometers
  - b. Location – they are confined to valleys
  - c. Location – they are not confined to valleys
  - d. They are perennial, i.e., they are long lasting
  - e. None of the above
10. A snowpack is defined as the results of multiple \_\_\_\_\_ over a \_\_\_\_\_  
\_\_\_\_\_.
11. Snowflakes are \_\_\_\_ crystals.
12. Powder is composed of ice crystals and \_\_\_\_ filled with air.

13. In the following illustration you can still recognize some aspects of an ice crystal, but much of the elegant crystal outlines have been destroyed. What is the name of the feature shown in the illustration?



14. A line marking the highest point at which a glacier's winter snow cover is lost during a given season is called the

- a. Ablation line
- b. Line of retreat
- c. Snowline
- d. End of forest line
- e. None of the above.

15. In the following illustration what does the area shown in blue and labeled “Upper part of glacier that is covered with snow year round” represent?

*Upper part of glacier that is covered with snow year round.*



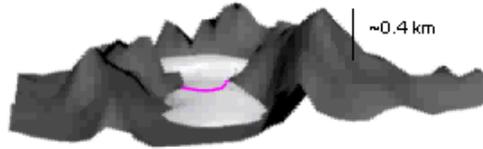
16. In the following illustration what does the area shown in blue and labeled “Lower part of glacier where calving, melting, and evaporation occur” represent?

*Lower part of glacier where calving, melting, and evaporation occur.*



17. In the following illustration what does the purple line labeled “The boundary between the zones of accumulation and wastage” represent?

*The boundary between the zones of accumulation and wastage.*



18. The terminus marks the farthest \_\_\_\_\_ extent of a glacier.

19. If the amount of water and ice a glacier loses is greater than the amount of snow it gains, then it will

- a. Advance
- b. Retreat
- c. Remain unchanged
- d. Retreat and then advance
- e. None of the above

20. Basal sliding refers to the movement of the \_\_\_\_\_ over bedrock.

21. Plastic flow occurs in

- a. The upper part of the glacier where crevasse are common
- b. At the interface between the underlying bedrock and the glacier
- c. In the lower part of the glacier between the interface with the bedrock and the overlying zone of rigidity

22. Relative to the zone of plastic flow where does the rigid zone occur?

23. A crevasse is an open void or crack that occurs in the zone of \_\_\_\_\_.

24. Glacial plucking is produced by the movement of the glacier away from areas where \_\_\_\_\_ has seeped into cracks and frozen.

25. The grooves in the bedrock illustrated in the photograph below are produced by the grinding of rocks caught up in the flowing glacier against the solid bedrock. What are the grooves in the polished glacial surface called?



26. How would you define till?

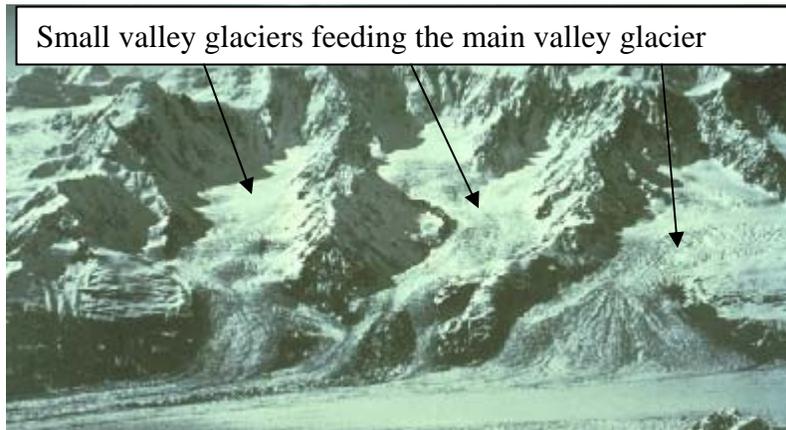
27. A valley that once was occupied by a glacier is typically described as \_\_\_\_\_.

28. In the following illustration, the main valley glacier is fed by three smaller glaciers. What do you call the main valley glacier?

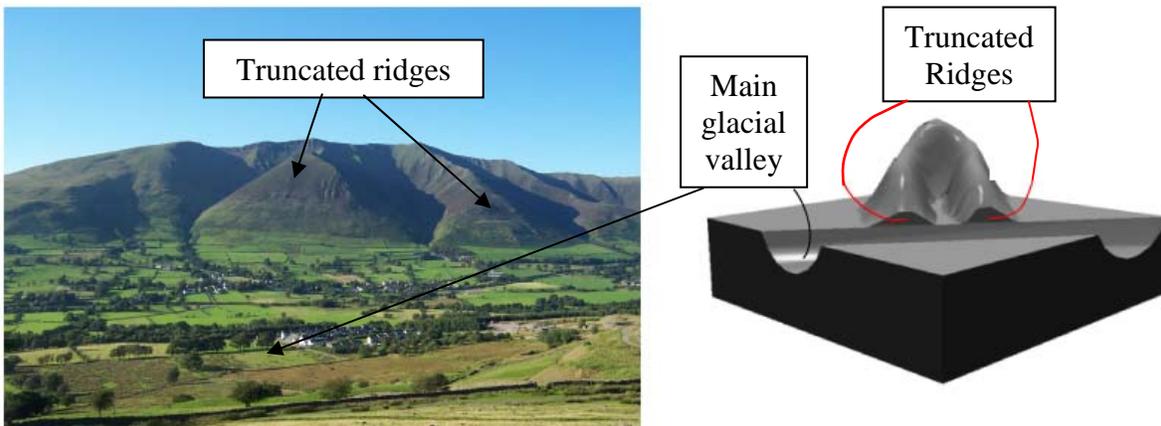


Main valley glacier

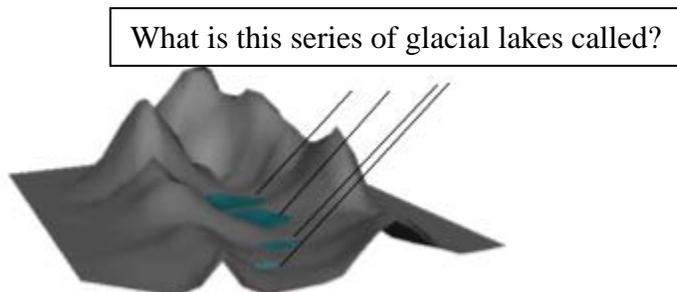
29. In the illustration below three small valley glaciers feed the main valley glacier. What are these smaller glaciers called?



30. In the following photograph and illustration the ridges extending down into the main glacial valley have been truncated by the large glacier once occupying the valley. What are these truncated ridges called?



31. In the following illustration, what is the series of glacial lakes called that occupy a valley once occupied by a glacier?.

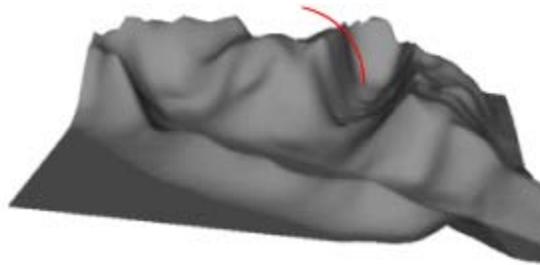


32. In the following photography what do you call the blocks of granite resting on the polished glacial surface at Ohmsted Point, Yosemite National Park? Note that they are totally unlike the plutonic rock that they rest on.



33. The featured illustrated below is an example of a valley once occupied by a tributary glacier. Bridalveil Creek in Yosemite National Park is another example. What do you call such valleys?

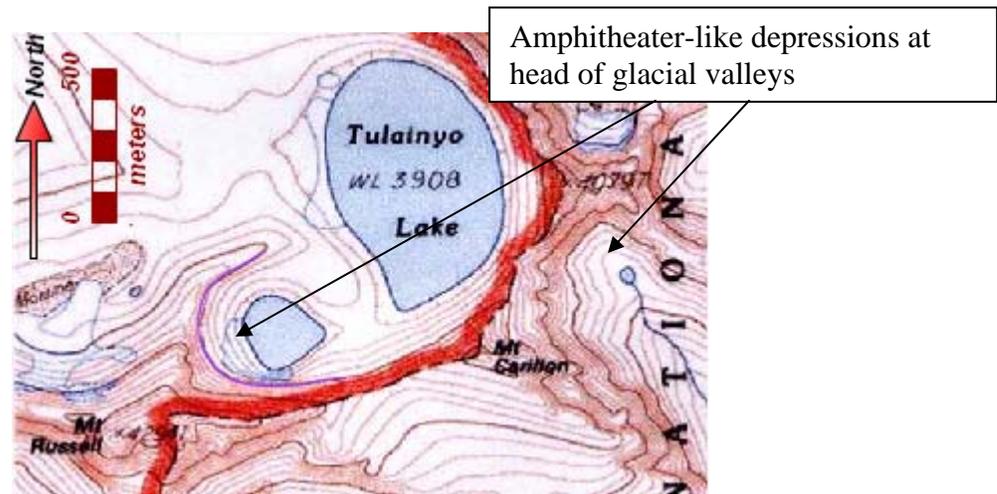
What do you call this feature?



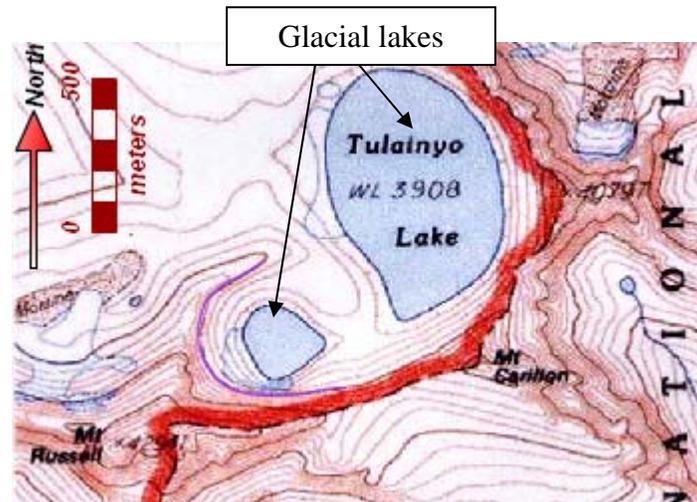
34. In the following illustration what is the smoothed streamlined hill cut into the bedrock called? Note that the glacier flowed from right to left.



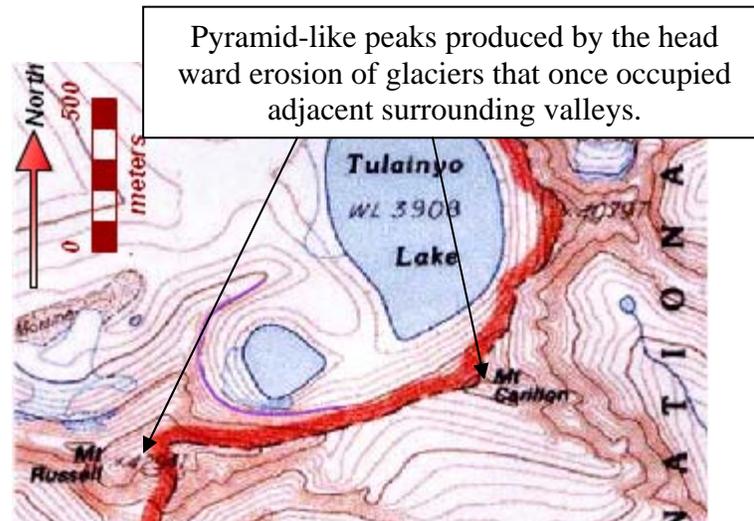
35. What are the amphitheater-like depressions occurring at the heads of the glacial valleys in the following illustration called?



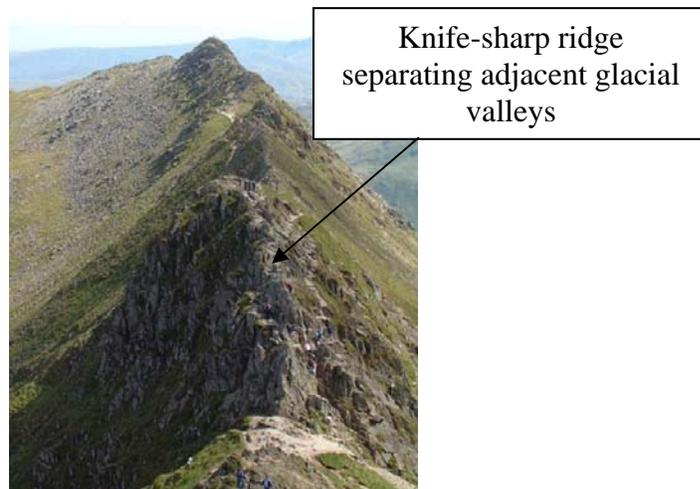
36. What are glacial lakes called?



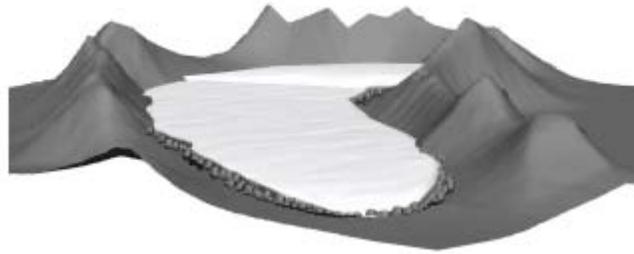
37. In the following illustration Mt. Russell and Mt. Carillon are pyramid-like in form. They were produced by the head ward erosion of glaciers that once occupied the valleys that now surround them. What are Mt. Russell and Mt. Carillon?



38. In the following illustration what is the knife-sharp ridge separating adjacent glacial valleys called?



39. In the following illustration what is the name of the ridge of till that lies along the terminus of the valley glacier?

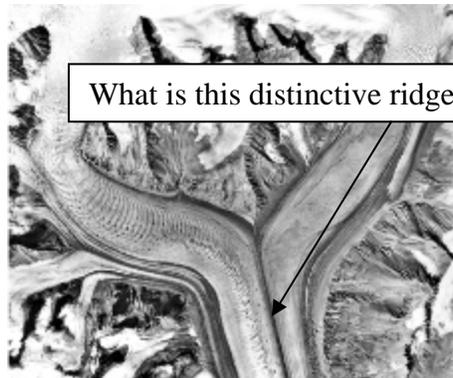


40. What would you call the ridge of material shown in the illustration for question 39 if it was produced by a glacier that was retreating?
41. What would you call the ridge of material shown in the illustration for question 39 if it was produced by a glacier that had reached its most down valley extent?
42. In the following illustration two valley glaciers merge to form one. What are the ridge-like accumulations of till located along the margins of each valley glacier called?

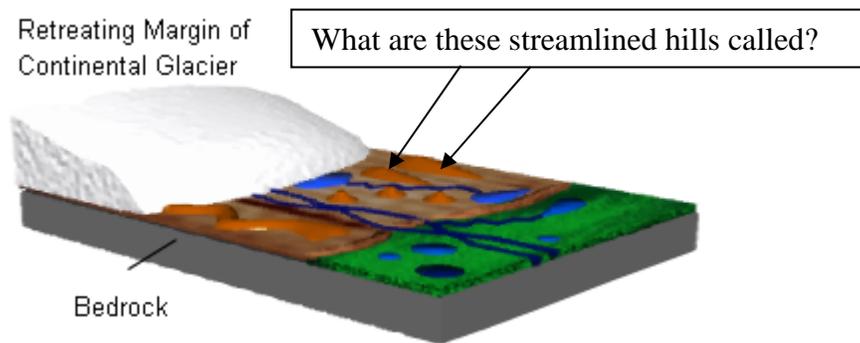


What are these glacial features called?

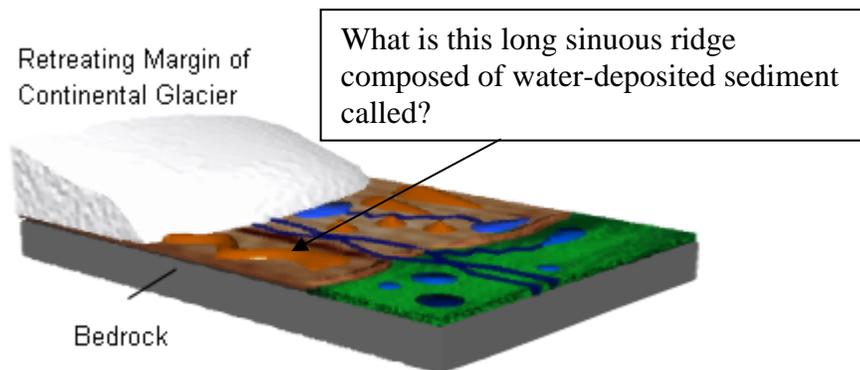
43. When two valley glaciers merge till accumulating along their interiors also merge to form a single distinctive ridge lying between the two glaciers. What is this distinctive single ridge composed of till called?



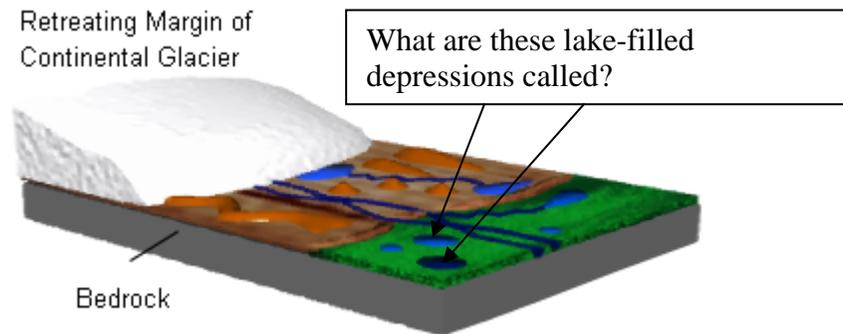
44. In the following illustration what are the streamlined hills of sediment called?



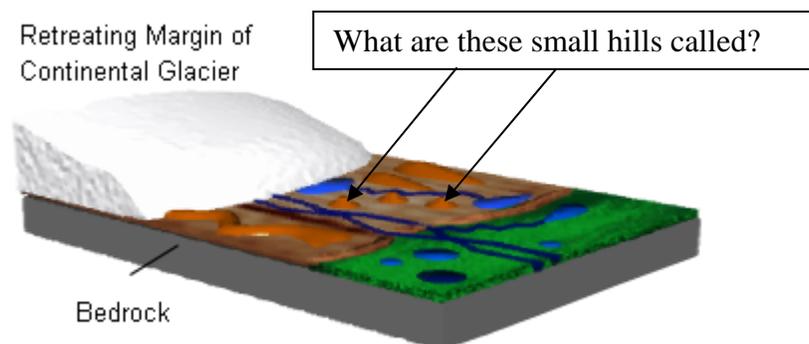
45. In the following illustration what is the long sinuous ridge composed of water-deposited sediment called?



46. When blocks of ice buried by sediment along the retreating margin of a continental glacier melt a depressions forms. In the following illustration what are these lake-filled depressions called?

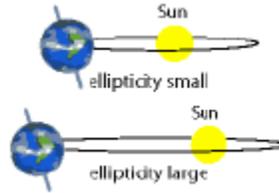


47. If sediment is washed into openings and depressions at the terminus of a wasting continental glacier, then a small hill is left behind. What is this small hill called?

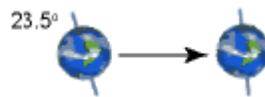


48. The Ice Age occurred 1.6 (or 1.8) million to 10,000 years ago during the \_\_\_\_\_.
49. Glacial and inter-glacial periods are likely caused by variations in the Earth's position and orientation relative to the Sun. This hypothesis is called the \_\_\_\_\_.

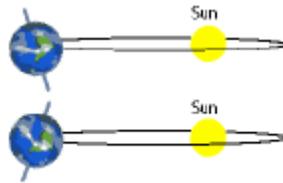
50. The following illustration schematically depicts the orbital path of the Earth around the Sun as varying from nearly circular to highly elliptical. It takes the Earth ~100,000 year to complete this cycle. What is the term used to describe this cyclical variation in the shape of the Earth's orbit?



51. The following illustration schematically depicts the tilt of the Earth's axis either toward or away from the sun as varying over the range of  $22.5^\circ$  to  $24.5^\circ$ . Currently, the tilt is  $23.5^\circ$ . It takes the Earth about ~43,000 years to complete one cycle of this variation in tilt. What is the term used to describe this cyclical variation?



52. As shown in the following illustration the Earth's axis wobbles like a top slowing down as it orbits the Sun. The Earth complete one cycle of this wobble every 20,000 years. What is the term used to describe this cyclical variation?



## Answers

1. gravity
2. 75 percent
3. 10 percent
4. approximately 70 meters
5. alpine, valley
6. ice sheets
7. ice caps
8. Antarctica and Greenland
9. a and c
10. snowfalls, single winter (season)
11. ice
12. voids
13. granule
14. snowline
15. Zone of accumulation
16. Zone of wastage
17. snowline
18. down valley
19. retreat
20. whole glacier
21. c
22. above the zone of plastic flow
23. zone of rigidity
24. melt water
25. Glacial striations
26. Till is poorly sorted and unlayered debris composed of gravel, sand, and clay that was deposited by a glacier
27. U-shaped
28. trunk glacier
29. tributary glacier
30. truncated spurs
31. paternoster lakes
32. exotic blocks
33. hanging valleys
34. ruche moutonnée
35. cirques
36. tarns
37. horns
38. arête
39. end moraine
40. recessional moraine
41. terminal moraine
42. lateral moraine
43. medial moraine

44. drumlin
45. esker
46. kettles or kettle lakes
47. kames
48. Pleistocene epoch
49. Milankovitch hypothesis
50. eccentricity
51. obliquity
52. precession