

**Awww Yeah**  
**Mnstrviola's Dynamic Planet Practice Test: GLACIERS!**



**Team Name:** \_\_\_\_\_

**Participants:**

\_\_\_\_\_

**Favorite Ice-Type Pokemon:**

\_\_\_\_\_

**Instructions~**

This test consists of 6 sections: A, B, C, D, E, and F. Your responses to sections A through D will be mostly written responses. The score for sections A - D will be multiplied by 2 for a total of 128 points. Section E is multiple choice, and will be worth 40 points. Ties will be broken by your response to the tiebreaker question in section F.

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**Total Score:** \_\_\_\_\_

**Tiebreaker Score, if necessary:** \_\_\_\_\_

## Section A: General Glacier Knowledge.

Here's a hard one- what exactly is a glacier? Be as specific as possible. [6 points]

Glaciers are ice masses made of fallen snow [2] that has compressed over many years into ice [2]. They have at one point flowed [2].

About how many glaciers are there currently on Earth? (Answer in a power of 10). On what continent[s] are glaciers found? [3 Points]

100,000 glaciers [1], All of them! [2]

Why are glaciers studied? [3 points]

They are indicators of past and present climate change. [3, 1 point for anything reasonable]

How do glaciers affect their environment? Give an example [6 points]

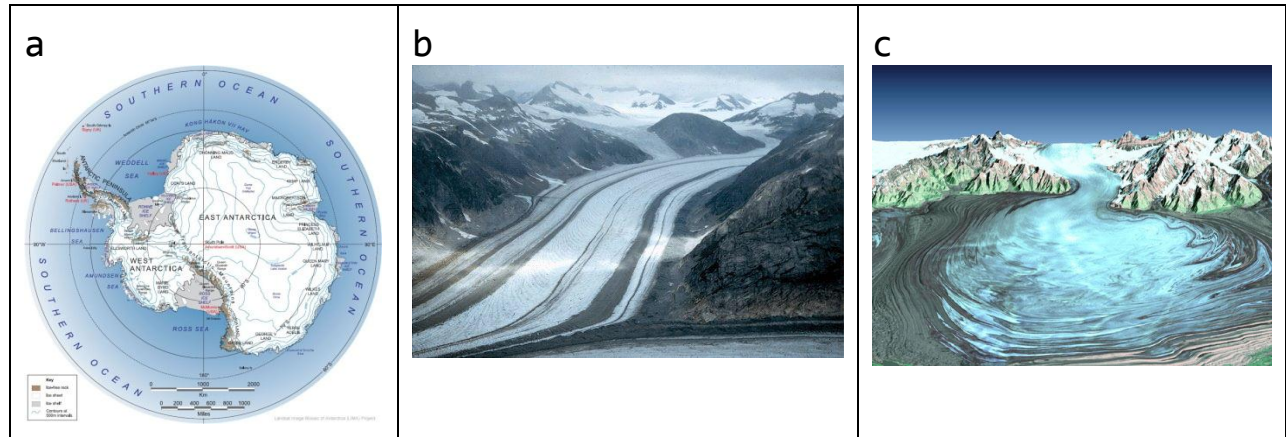
They can weather the landscape [2] and deposit sediment [2]. Glaciers also affect the temperature of the surrounding environment [1]. (Example is [1] point)



Score for this page  
\_\_\_\_\_ out of 18

## Section B: Glacier Type Identification

Identify these glacier types [9 Points].



a. Continental / Ice sheet [3]

b. Valley / Alpine [3]

c. Piedmont [3]

What are the lines in glacier B called? [2 Points]

Moraines

Which of these is the largest? [1 Point]

Glacier A (Continental / Ice Sheet) [1]

Which glacier demonstrates linear flow the best? [1 Point]

Glacier B

How is glacier C formed? [2 Points]

When a valley glacier empties out into a plain, where it spreads out.



Score for this page:

\_\_\_\_\_ out of 15

## Section C: How do Glaciers Move?

Identify and Describe two **factors** affecting the speed Alpine Glaciers move. [8 points]

Alpine Glaciers move through two important processes: Gravity (Mass/Weight) [3] and Basal Sliding [3]. The heavier a glacier, the more powerful the force of gravity will be, so the glacier will be pulled down the mountain [1]. Water at the bottom of the glacier reduces friction, making it easier to slide [1].

What is Plastic Flow, and where does it occur within a glacier? [5 points]

Plastic Flow is when the molecules of ice form sheets and slide on top of another [3]. The ice moves internally, almost like a plastic. Plastic Flow occurs in the lower middle region of a glacier, where there is enough pressure for the molecules to form sheets [2].

When a glacier moves fast, it is called surging [1 point]. This can lead to large cracks on the surface of the glacier when it passes over a bump; these cracks are called crevasses [1 point].

At the bottom of a glacier, ice can dislodge and pick up chunks of rocks; this process is called plucking [1 point]. When a lot of plucking occurs over a small hill, the hill can be transformed into a rochee mountonee [1 point].



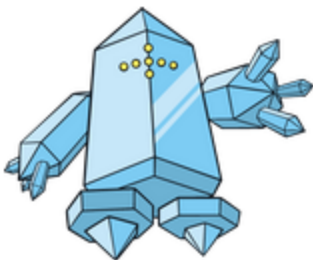
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## Section D: Weathering, Erosion, and Deposition

What is the difference between Erosion, Deposition, and Weathering? [3 points, all or none!]

Circle the correct phrase. [1 point each]

- Ice is a {powerful / not-so-powerful} agent of erosion.
- Material deposited by glaciers is usually {well / poorly} sorted.
- Abrasion is an example of {weathering / deposition}.
- Moraines are formed by {erosion / deposition}.
- Meltwater from glaciers deposit sorted till called {till / outwash}.
- Valley glaciers occupy mountain basins called {drainage basins / cirques}
- Concerning glaciers, ice itself is the primary erosional substrate: {true / false}
- Drumlins point {toward / away} from their glacial source.
- Recessional Moraines are located {behind / in front of} the terminus of a glacier.
- Entrainment is a(n) {erosional / depositional} process.
- Kettle lakes are primarily formed by {erosion / deposition}



Score for this page:

\_\_\_\_\_ out of 14

Score Calculation

\_\_\_\_\_ score for A

\_\_\_\_\_ score for B

\_\_\_\_\_ and for C

\_\_\_\_\_ finally, for D

+ \_\_\_\_\_ ... add `em all!

\_\_\_\_\_ total, out of 64

x \_\_\_\_\_ ... multiply by 2

\_\_\_\_\_ TOTAL SCORE FOR SECTIONS A through D out of 128

\_\_\_\_\_ score for section E

+ \_\_\_\_\_ add `em up

\_\_\_\_\_ TOTAL SCORE FOR WHOLE TEST: A, B, C, D, and E

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### Section E: Multiple Choice

Choose **all** correct choices by writing the correct letter(s) in the answer boxes below. (There may be more than one, or there may be none! If there are no answers, leave it blank or put N). 1 point for each completely correct answer.

1. B, C	2. B, C, D	3. A, B	4. D
5. C	6. A, B, C, D	7. C	8. no answer
9. B, D	10. A, B	11. no answer	12. A
13. C	14. C, D	15. C	16. A, C
17. D	18. A, B	19. A	20. C
21. C	22. D	23. B	24. A
25. A	26. B	27. A	28. C
29. A	30. A	31. D	32. B
33. D	34. A, C	35. B, C	36. A, C
37. B, D	38. A, B, C, D	39. A	40. B

1. Which of these are NOT part of the Milankovitch Cycles?
  - A. The change in the tilt of Earth's axis
  - B. The change in the speed of Earth's rotation
  - C. The change in the amount of CO<sub>2</sub> in Earth's atmosphere
  - D. The change in the shape of Earth's orbit
  
2. We are currently in the/a...
  - A. Pleistocene Epoch
  - B. Holocene Epoch
  - C. Quaternary Period
  - D. Interglacial Period
  
3. Continental Ice Sheets...
  - A. are a type of glacier
  - B. subsidise the land underneath them
  - C. reflect sunlight back into space, an example of negative feedback
  - D. are the same thing as ice fields
  
4. Which of these does not belong?
  - A. Bergschrund
  - B. Ravine
  - C. Crevasse
  - D. Icefall
  
5. Which of these are least associated with the word "periglacial"?
  - A. frost action
  - B. shattering
  - C. abrasion
  - D. frost push
  
6. Which of these factors affect the extent of periglaciation in a certain area?
  - A. Latitude
  - B. Altitude
  - C. Ocean Currents
  - D. Continentality
  
7. Which of these contribute the most H<sub>2</sub>O to glaciers?
  - A. Human Impact
  - B. Rain that freezes on the ground
  - C. Snow
  - D. Ocean Water that freezes to icebergs

8. Which of these are not a form of precipitation?
- A. Rain
  - B. Snow
  - C. Sleet
  - D. Hail
9. Icebergs...
- A. Combine to form glaciers
  - B. Are made from glaciers
  - C. Are considered mini glaciers
  - D. Are made of freshwater
10. Ice Cores...
- A. are used to determine the atmosphere from previous times
  - B. are used to determine the climate from previous times
  - C. are relatively sturdy and can withstand temperatures above freezing
  - D. consist primarily of glacially eroded sediment
11. What is true of a typical ice age?
- A. The earth was completely covered in ice
  - B. It was wet and snowed and rained a lot
  - C. It was caused by an asteroid impact
  - D. All animals on earth become extinct
12. How does basal melting affect abrasion?
- A. Higher melting results in more abrasion
  - B. Higher melting results in less abrasion
  - C. It doesn't affect it at all
  - D. Basal melting is never present during abrasion
13. If a glacier's ablation is  $384\text{m}^3$  and accumulation is  $176\text{m}^3$ , what is its mass balance?
- A.  $208\text{m}^3$
  - B.  $560\text{m}^3$
  - C.  $-208\text{m}^3$
  - D.  $71424\text{m}^3$



14. What landforms can be identified in this picture?
- A. Horn
  - B. Arête
  - C. Serac
  - D. Crevasse





15. What landform can be identified in this picture?

- A. Serac
- B. Roche Moutonnee
- C. Drumlin
- D. Horn



16. What landform can be identified in this picture?

- A. Roche Moutonnee
- B. Drumlin
- C. Sheepback
- D. Terminal Moraine

17. What letter can describe the shape of a glacially-eroded valley?

- A. Q
- B. V
- C. I
- D. U

18. What is an ice wedge?

- A. An erosional agent
- B. A depression in the ground filled with ice
- C. A tool used to break ice
- D. A weapon carved of glacial ice

19. Which of these do not belong, based on shape?

- A. Suncup
- B. Ribbon Lake
- C. Esker
- D. They all are shaped the same

20. Which of these lakes are not formed by glaciers?

- A. Ribbon Lake
- B. Kettle Lake
- C. Oxbow Lake
- D. The Great Lakes

21. What is stoss and lee, respectively?

- A. Erosional landforms and depositional landforms
- B. Depositional landforms and erosional landforms
- C. Upstream side and downstream side
- D. When a glacier is moving, and when it is in equilibrium



22. Identify this landform.

- A. Cyroconite
- B. Moulin
- C. Penitent
- D. Erratic



23. Identify this body of water, an inlet formed by glacial erosion.

- A. Nunatak
- B. Fjord
- C. Estuary
- D. Aquifer



24. Identify this mountain landform, a circular depression.

- A. Cirque
- B. Nunatak
- C. Arête
- D. Sheepback



25. Identify this landform, a glacially-carved peak

- A. Horn
- B. Arête
- C. Acmete
- D. Mountop

26. River : Waterfall :: Glacier : ? (Rivers are to waterfalls as glaciers are to ?)

- A. Glacierfall
- B. Icefall
- C. Serac
- D. Avalanches

27. Which of these are the most potentially harmful (pick 1)?

- A. Jokulhlaup
- B. Kettle
- C. Kame
- D. Glacierfall



28. Identify these small lakes formed

by melting of glacier ice chunks

- A. Moulin
- B. Cyroconite
- C. Kettle
- D. Kame



29. Identify this type of glacier.

- A. Rock glacier
- B. Sedimented glacier
- B. Dirty glacier
- D. Outspill glacier

30. A higher concentration of O18 to O16 in an ice core mainly correlates to...

- A. Higher temperatures
- B. Lower temperatures
- C. More compact ice
- D. More oxygenated ice

31. Fluvially-sorted sediment tends to be...

- A. more mixed, more sharp
- B. better sorted, more sharp
- C. more mixed, more rounded
- D. better sorted, more rounded

32. Which of these tend to be bigger?

- A. cyroconites
- B. bergschrund
- C. they are the same size
- D. they can not be measured in size

33. What is currently the largest glacier in the world?

- A. Agassiz Glacier
- B. Laurentide Glacier
- C. Malaspina Glacier
- D. Lambert Glacier

34. What is true of the Laurentide Ice Sheet?

- A. It was/is located in North America
- B. It is still present today
- C. It left behind glacially-scoured valleys and glacial till
- D. It was present during most of the Pliocene Epoch

35. What is true of isostatic rebound?
- A. It causes a relative rise in sea levels (relative to the landmass that is rebounding)
  - B. It causes a relative fall in sea levels (relative to the landmass that is rebounding)
  - C. It can be caused when a glacier melts
  - D. It can be caused when a glacier grows
36. What is true of the Younger Dryas event?
- A. Humans were alive during the time
  - D. It was a warm interglacial period
  - C. There are many theories as to how it began
  - D. It lasted over 3000 years
37. What is true of a moulin?
- A. They are depositional landforms
  - B. They can be very deep, and lead to caves
  - C. They make good temporary shelters for glaciologists
  - D. They can carry meltwater internally
38. Which is true about ice and water?
- A. They are of the same element
  - B. Water is more dense
  - C. Ice is part of the water cycle
  - D. Ice floats in water
39. What is the process where water goes from a gaseous to solid state?
- A. Sublimation
  - B. Immediatation
  - C. Solufication
  - D. Precipitation
40. Where is most of Earth's fresh water stored? (pick one)
- A. In the oceans
  - B. In glaciers
  - C. In aquifers, underground
  - D. In man-made water storages

### **Section F: Tiebreaker**

What methods do we have for measuring a glacier's mass-balance? How can a change in a glacier's mass-balance affect the area around it?