Part 5 Ice Ages, Glaciers, Landforms

Name:

Part 5 Lesson 1 Glaciers

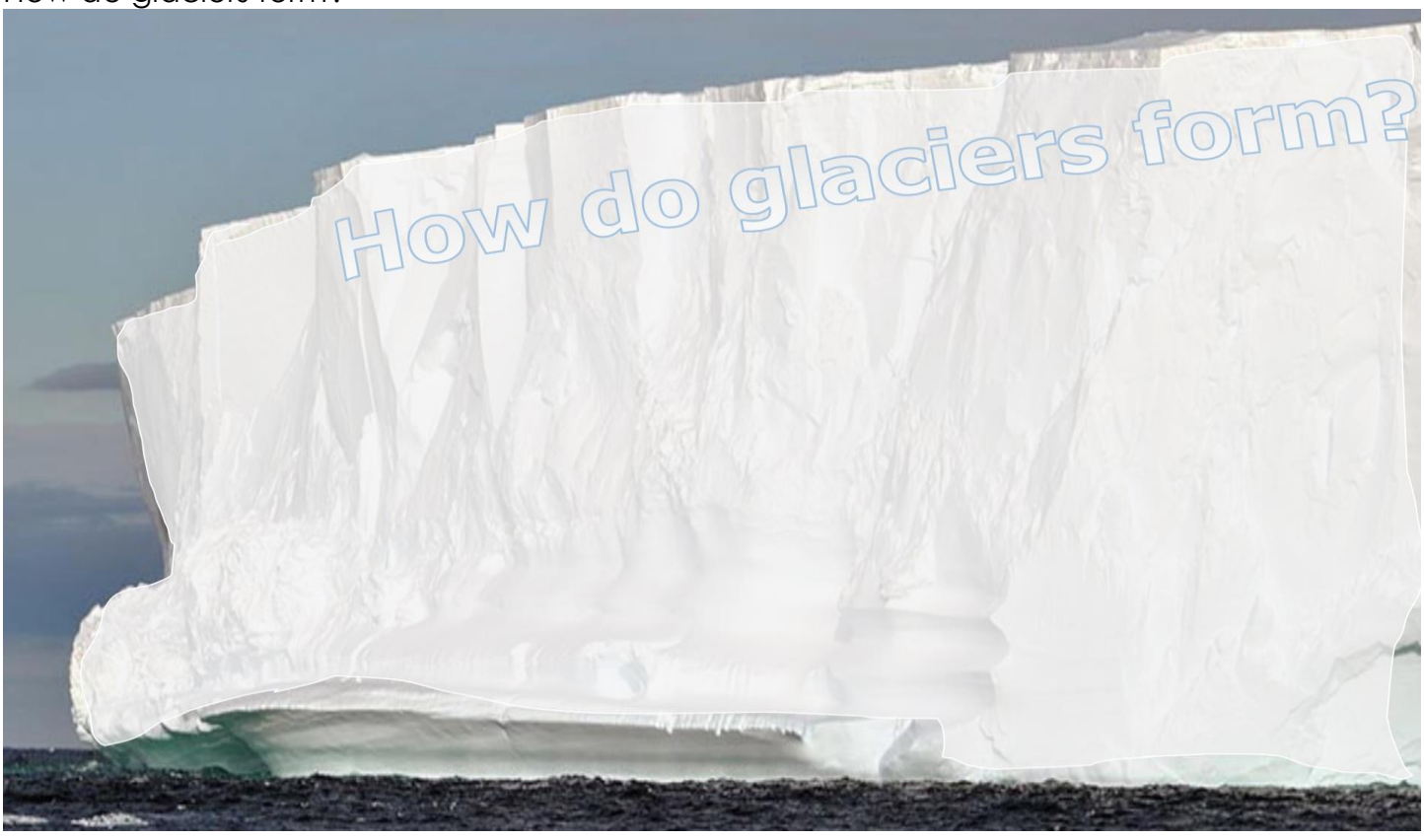
Please discuss how this rock arrived at this position. Why is it shaped the way it is?

Glacier- A moving mass of snow and ice that moves _____.

Glaciers form when more snow and ice a_____ than melt. It takes many years and the snowfall compacts into ice.

Crevasse: A _____ in an ice sheet or glacier.

How do glaciers form?



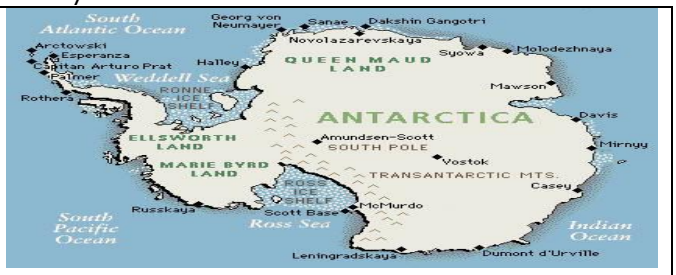
Two types of glaciers

-_____ Glaciers: A Giant ice sheet that spreads out from a center of accumulation.

-_____ Glaciers: A glacier that starts in a mountain and moves into a valley.

Which is an alpine and which is a continental glacier. Why?

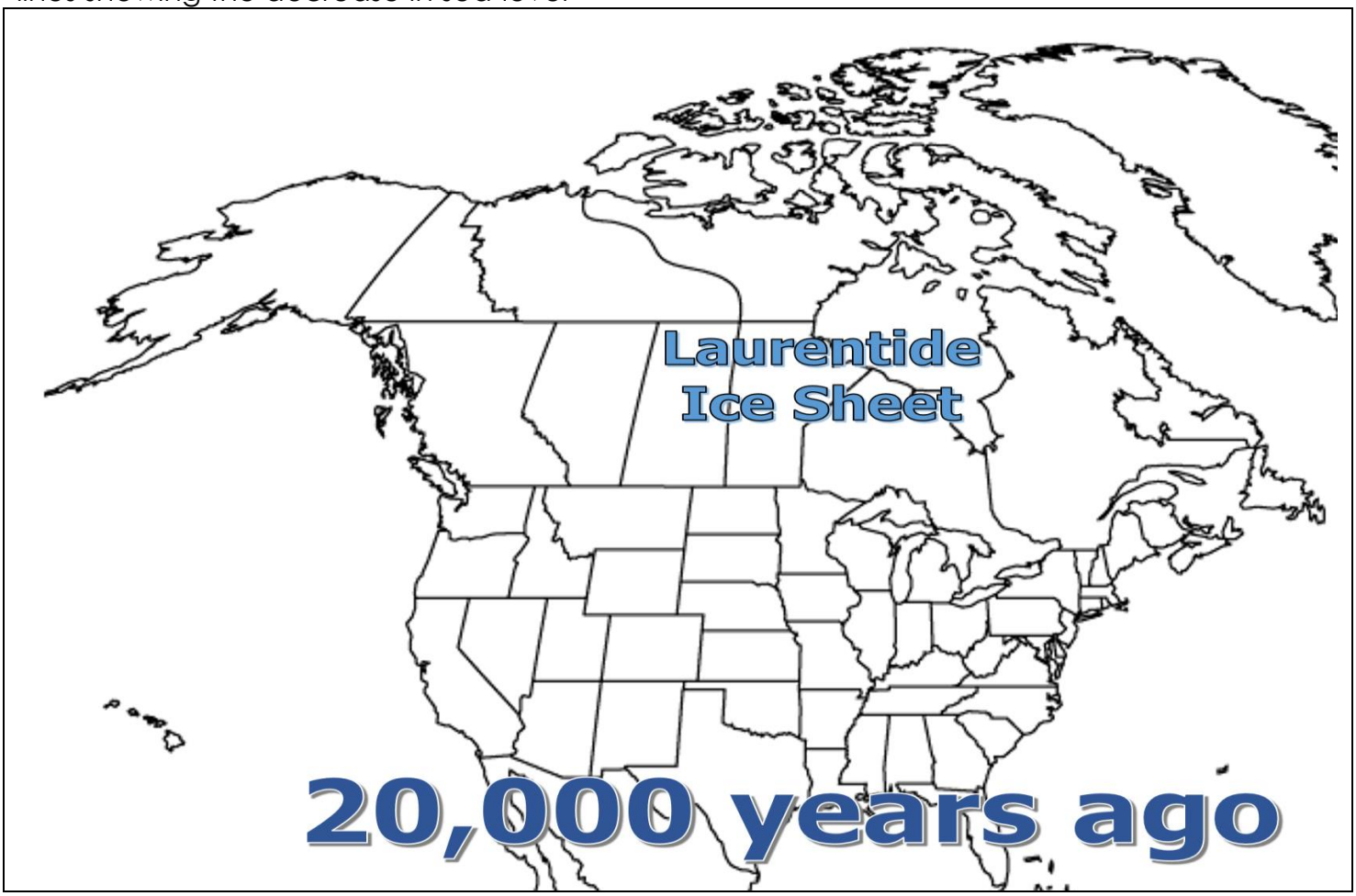
Answer=



Answer=

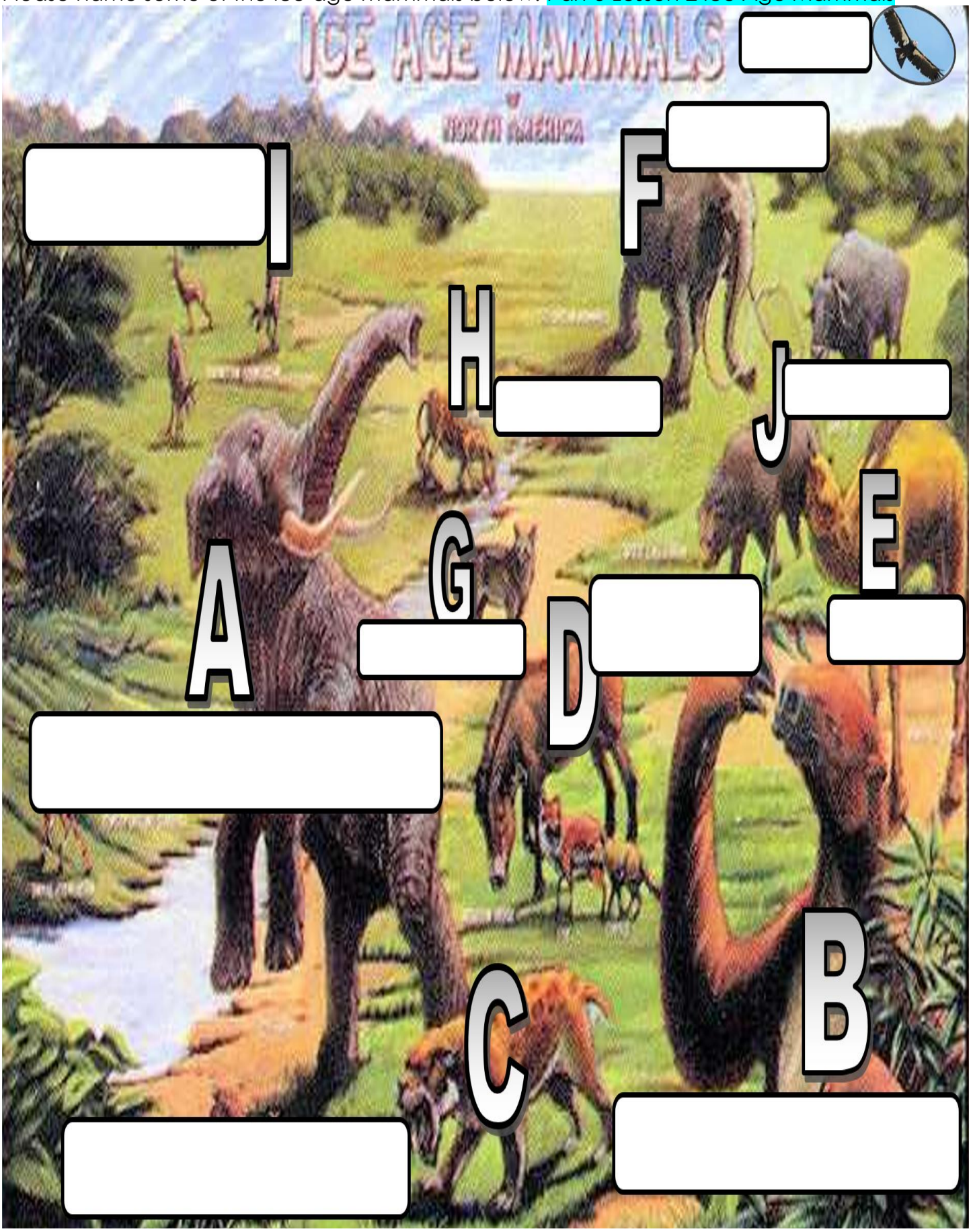
_____ – A giant piece of freshwater ice that broke off of a glacier or ice shelf.

Use the map below to describe the Laurentide Ice Sheet in North America between 95,000 and 20,000 years ago. Please draw the extent of the massive ice sheet. Can you include lines showing the decrease in sea-level



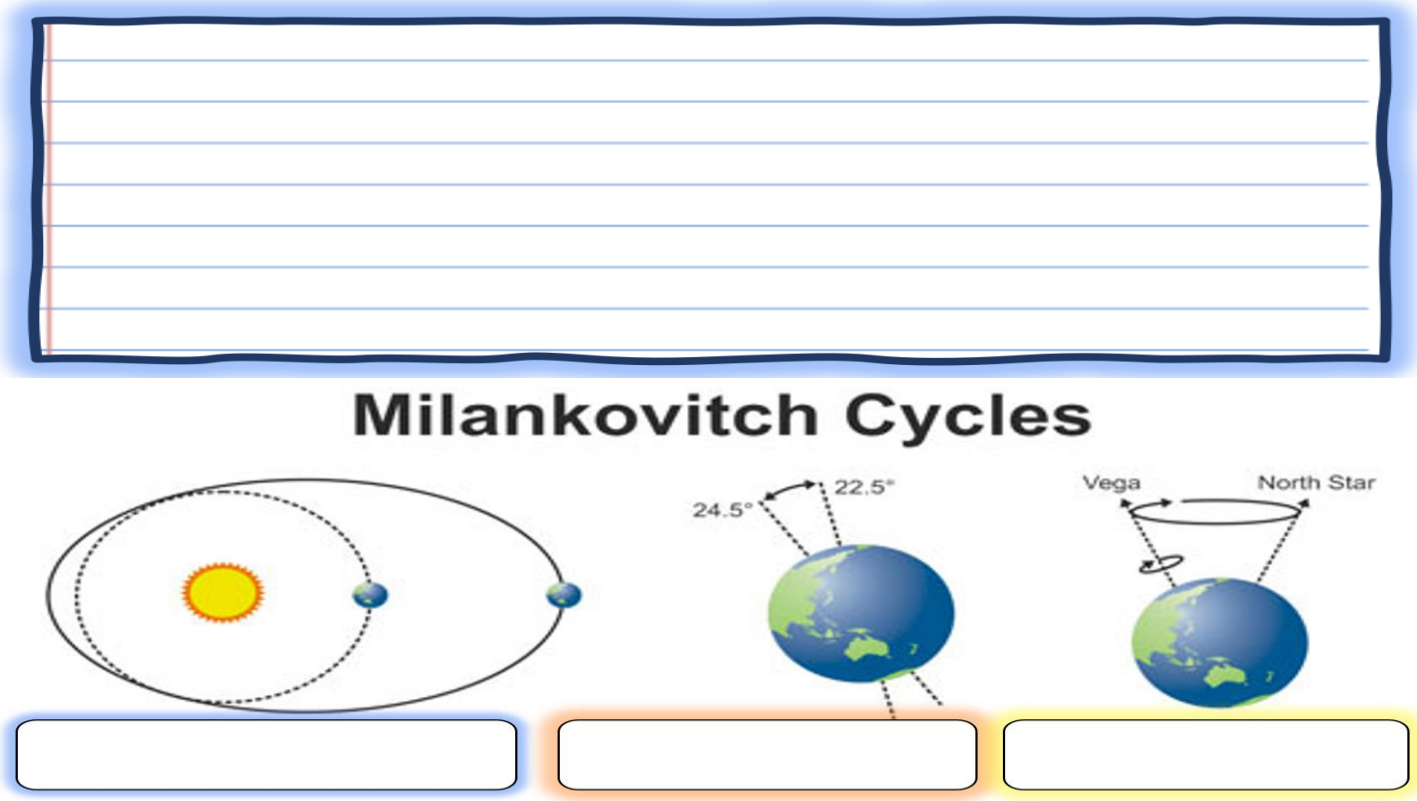
Ice Age: A _____ period marked by episodes of extensive glaciation alternating with episodes of relative_____.

Please name some of the ice age mammals below. Part 5 Lesson 2 Ice Age Mammals



Part 5 Lesson 3 Milankovitch Cycles

Why do ice ages occur? Think Milankovitch! Use the visuals below to help you for a response.



- Milankovitch Cycles
  - Eccentricity (_____year cycle)
  - Axial Tilt (_____year cycle)
  - Precession (_____ year cycle)

_____ _____: A period roughly spanning 1645 to 1715 when sunspots became exceedingly rare, as noted by solar observers of the time.

- Fewer sun spots = less solar radiation.
- This led to a cooler period on Earth / Little Ice Age. (Theory)

Part 5 Lesson 4 Glacial Landforms I

Glacial _____**:** A piece of rock carried by glacial ice some distance from the rock outcrop from which it came.

_____ Piles of weathered glacial _____.

_____: Manmade pile of stones, usually conical, and often marks the path of an alpine trail.

Glacial _____: Multiple, straight _____ lines which represent the movement of the sediment loaded base of a glacier.

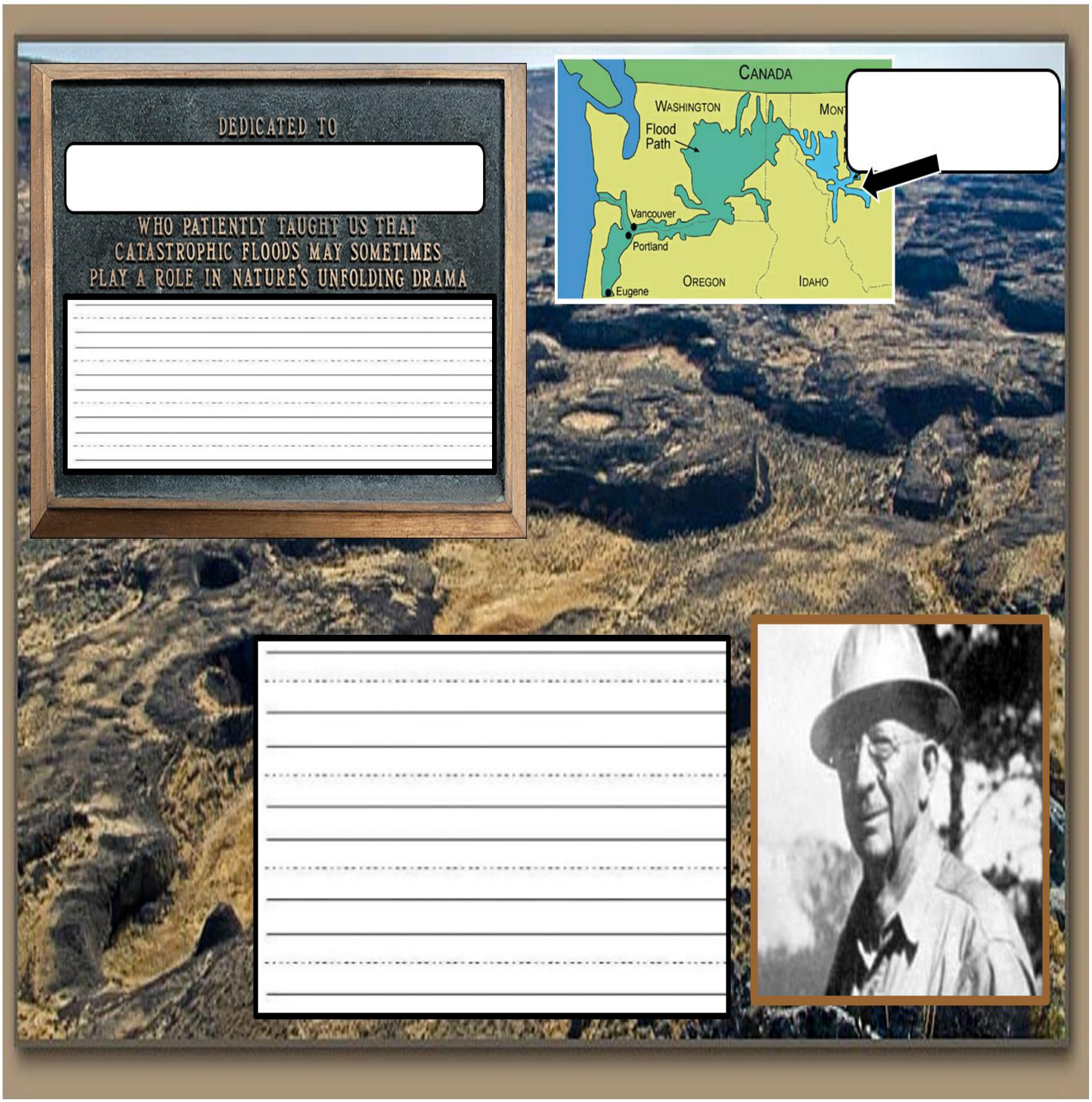
____-Shaped Valley: Glaciers carve valleys into a U shape.

_____: U-Shaped valley near the _____

_____ Lake: A body of water with origins from glacier activity.
They are formed when the glacier erodes the land and then melts, filling the depression.

_____ : A depression filled with water left by a glacier.

Part 5 Lesson 5 Glacial Landforms II



_____: A glacial _____ produced by scouring. These are often found in cirques.

_____: A sharp peak on a mountain cut by glaciers.

_____: A steep-sided carve into a mountain by a glacier.

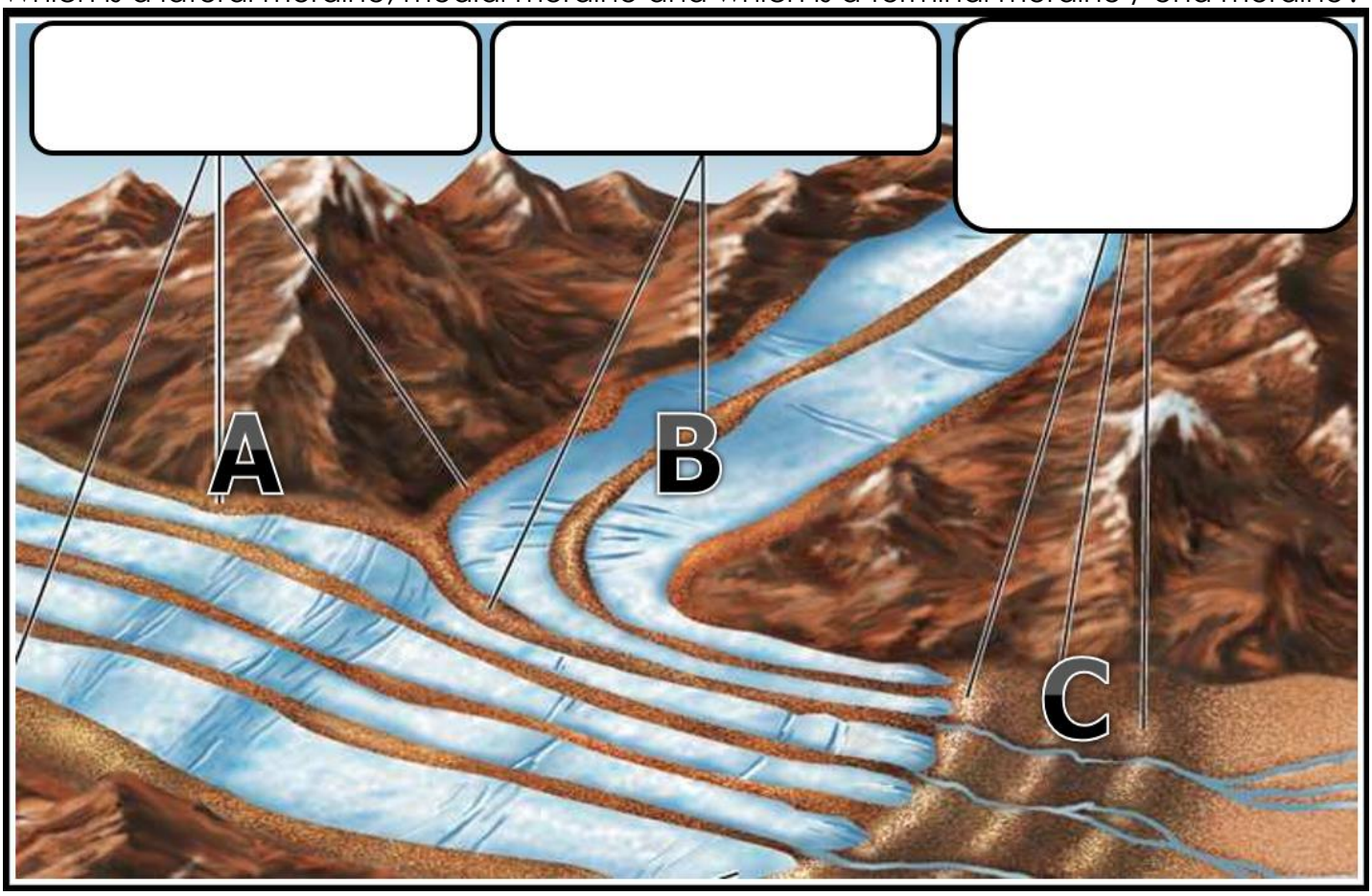
_____: A knife _____ caused by glaciers and erosion.

Roche Mountonnée: Exposed rock with a gently sloping upstream side that has been _____ and polished by a glacier and an abrupt, _____ downstream side.

_____: A narrow, steep-sided _____ of sediment, the remains of sediment piling up in a winding river under the glacier.

_____: Material _____ by a glacier and then deposited. Many types of Moraines.

Which is a lateral moraine, medial moraine and which is a terminal moraine / end moraine?



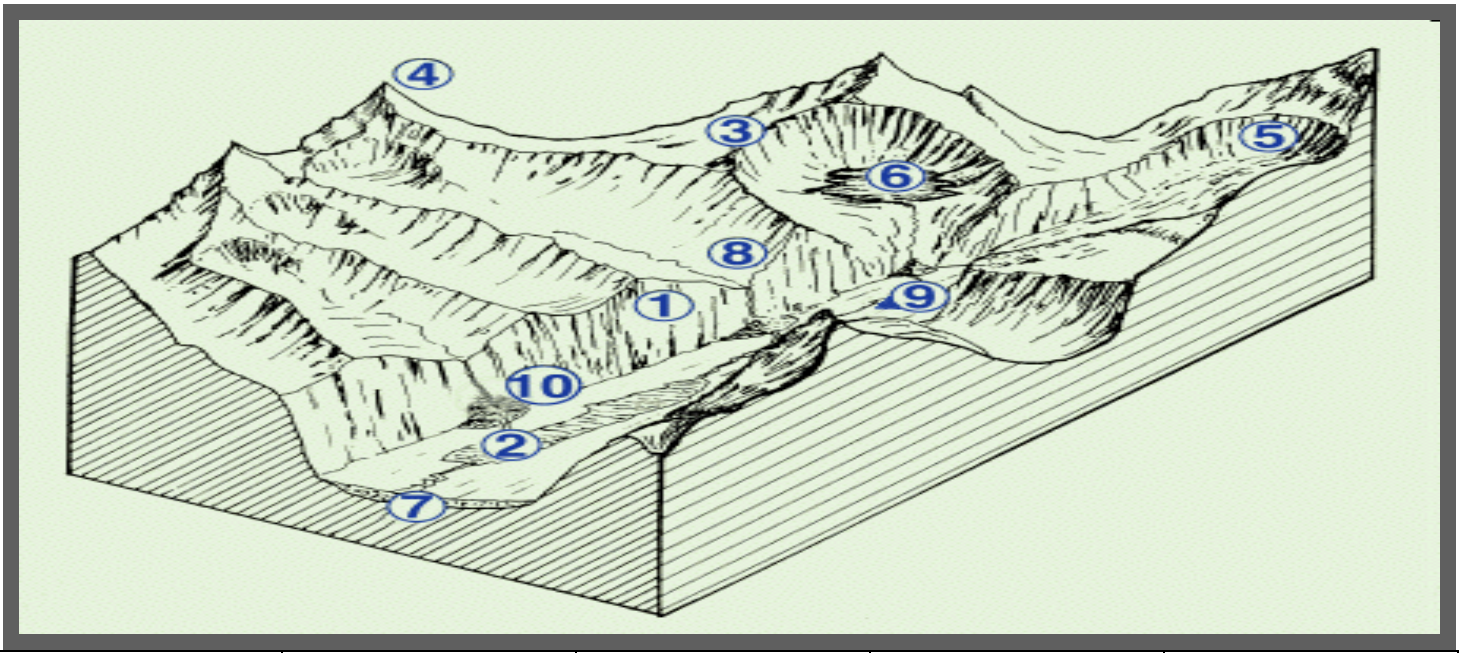
Part 5 Lesson 6 Glacial Landforms Quiz and Wrap-Up

_____: Ridge of rock jutting from the side of a glacial trough, or valley.

_____: Formed glacial till (sediment). They are _____ features that can reach a kilometer or more in length.

_____: Material deposited by the _____ -laden glacial valley.

Name the Glacial Landform 1-10



1	2	3	4	5
6	7	8	9	10

Please identify and **<u>then describe</u>** the specific type of the glacial landforms below. In some questions there may be more than one can be identified.

Quiz 1-20 Name the Glacial Feature most represented in the photo. Glacial landforms can be used more than once.

- Keep an eye out for the owl (+1pt) secretly write owl after your answer.

1)	2)	3)	4)
5)	6)	7)	8)
9)	10)	11)	12)
13)	14)	15)	16)
17)	18)	19)	20)
Bonus	Bonus		

Notes from Videos

- https://www.youtube.com/watch?v=HEStq4VYJ2Y&list=RDCMUCBOBwExgkuaHOIIY_ffb3MQ&index=6

Circle words associated with soil, weathering, ice ages, and glaciers. 30+ can be found! They can go forward and backwards.

EROGSOILGHYLMECHANICALWEATHERINGUGHQMSCHEMICALG
H
O
IDLWFRFROSTWEDGINGMGARCHHGLOROOTWEDGINGHEMOLEKH
R
TGFOLIATIONHNMOMUHOYRPRCKSVHKTHERMALEXPANSIONYTW
O
THRELICHENSCARBONATIONGHANGLEOFREPOSENMYHJERETYES
R
ETYEMYEAREOXIDATIONHUSTALAGMITERTILOVEOFESITHJSOI
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ISOSSLUMPHDIRTMNBOULDERJHYCOBBLEMNFGGRAVELIYPPEERC
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YTYCLAYYGDUSDUSTUPERMEABLEUGYRPOROSITYJUHORIZONER
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INDBREAKJNMANUREGLACIERJERRATICGICEBERGMAMMOTHDRS
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TYTALUSCARCAIRNUSTRIATIONSUSHAPEDVALLEYFJFJORDTYTA
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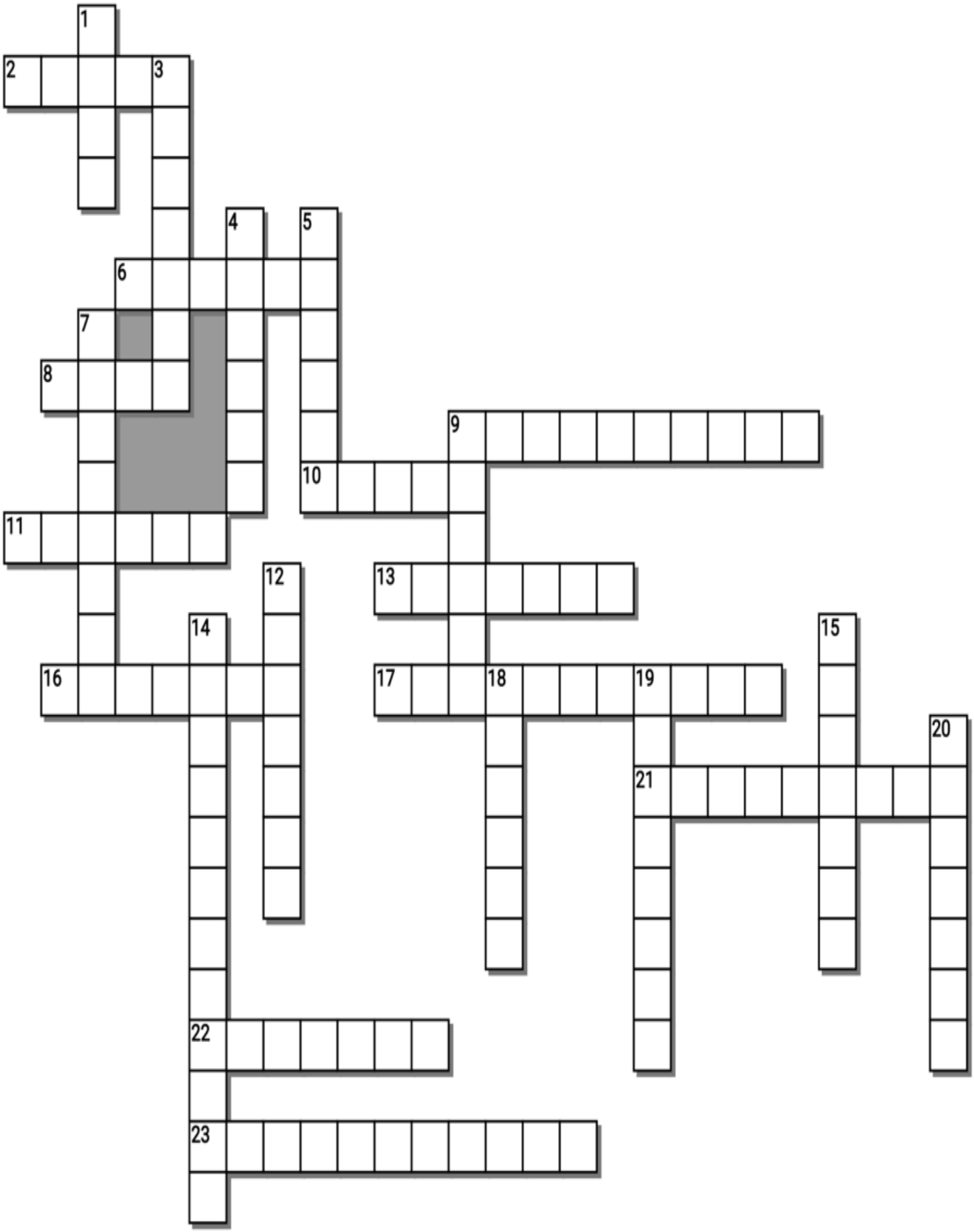
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#17 Across – Unit of time during the last ice age. Many large mammals existed during this epoch.

Across

2. U-Shaped valley near the sea
6. _____ Glaciers: A glacier that starts in a mountain and moves into a valley
8. A glacial lake produced by scouring. These are often found in cirques.
9. Glaciers form when more snow and ice _____ than melt. It takes many years and the snowfall compacts into ice.
10. A narrow, steep-sided ridge of sediment, the remains of sediment piling up in a winding river under the glacier.
11. U-Shaped _____: Glaciers carve valleys into a U shape.
13. Material deposited by the debris -laden glacial valley.
16. A moving mass of snow and ice that moves downhill.
22. _____ A giant piece of freshwater ice that broke off of a glacier or ice shelf.
23. _____ Glaciers: A Giant ice sheet that spreads out from a center of accumulation.

Down

1. A sharp peak on a mountain cut by glaciers.
3. Formed glacial till (sediment). They are elongated features that can reach a kilometer or more in length.
4. A steep-sided carve into a mountain by a glacier.
5. _____ Lake : A depression filled with water left by a glacier.
7. Glacial Striations: Multiple, straight _____ lines which represent the movement of the sediment loaded base of a glacier.
9. A knife edge caused by glaciers and erosion.
12. Material transported by a glacier and then deposited. Many types of Moraines.
14. The onset of an ice age is related to the _____ cycles – This included eccentricity, obliquity, and precession.
15. Glacial _____: A piece of rock carried by glacial ice some distance from the rock outcrop from which it came.
18. A cold period marked by episodes of extensive glaciation alternating with episodes of relative warmth.
19. Glaciers form when more snow and ice accumulate than melt. It takes many years and the snowfall _____ into ice.
20. _____ Minimum: A period roughly spanning 1645 to 1715 when sunspots became exceedingly rare, as noted by solar observers of the time.

----------Teacher can remove this word bank to make puzzle more challenging----------

Possible Answers

ALPINE, ARET'E, CIRQUE, COMPACTS, CONTINENTAL, DRUMLIN, ESKER, FJORD, GLACIER, HORN, ICEAGE, ICEBERG, KETTLE, MAUNDER, MILANKOVITCH, MORAINE, OUTWASH, PARALLEL, PLEISTOCENE, TARN, VALLEY, ACCUMULATE, ERRATIC, MEGAFAUNA

Ice Ages and Glaciers Quiz
1-20 = 5 pts
*20-*25 * = Bonus + 1 pt,
(Secretly write owl in correct space +1 pt)
Final Question = 5 pt wager

Name:
Due: Today

Score ____ / 100

SOMETHING CHILLY	PALEO ECOLOGY	THAT LOOKS COOL	THAT's WHAT THAT IS	CHILLED Bonus round 1 pt each
1)	6)	11)	16)	*21)
2)	7)	12)	17)	*22)
3)	8)	13)	18)	*23)
4)	9)	14)	19)	*24)
5)	10)	15)	20)	*25)

Final Question Wager ___ /5 Answer: _____

Ice Ages, Glaciers, Landforms

Part 4 Ice Ages, Glaciers, Glacial Landforms

Use the map below to describe the Laurentide Ice Sheet in North America between 95,000 and 20,000 years ago. Please draw the extent of the massive ice sheet.

How do glaciers form?

Glaciers begin to form when snow remains in the same area year-round, where enough snow accumulates to transform into ice. Each year, new layers of snow bury and compress the previous layers. Over many years of colder weather the glacier increases. If periods get warmer the glacier may melt.

Glacier- A moving mass of snow and ice that moves downhill.

Glaciers form when more snow and ice accumulate than melt. It takes many years and the snowfall compacts into ice.

- Two types of glaciers

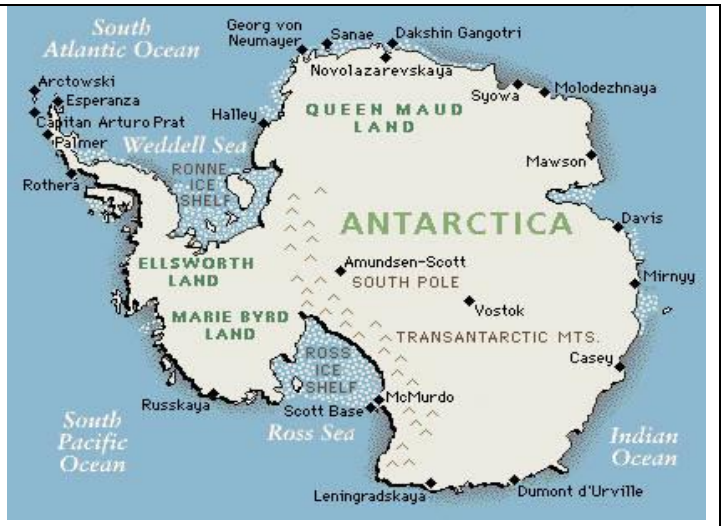
- -Continental Glaciers: A Giant ice sheet that spreads out from a center of accumulation.
- -Alpine Glaciers: A glacier that starts in a mountain and moves into a valley.

Iceberg – A giant piece of freshwater ice that broke off of a glacier or ice shelf.

Ice Age: A cold period marked by episodes of extensive glaciation alternating with episodes of relative warmth.

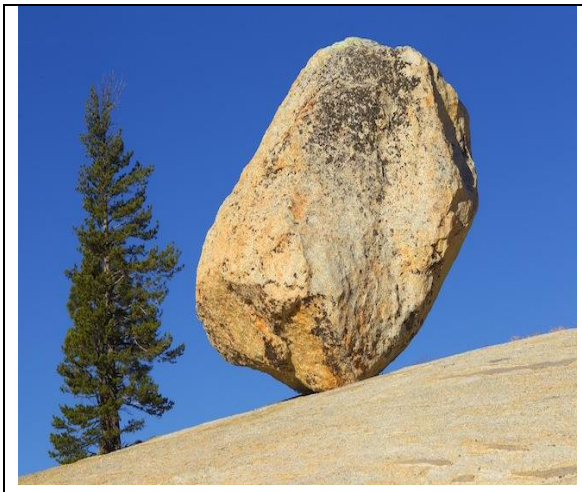
Which is an alpine and which is a continental glacier.

Answer=
-Alpine Glaciers: A glacier that starts in a mountain and moves into a valley.



Answer= Continental Glaciers: A Giant ice sheet that spreads out from a center of accumulation.

Please discuss how this rock arrived at this position. Why is it shaped the way it is?

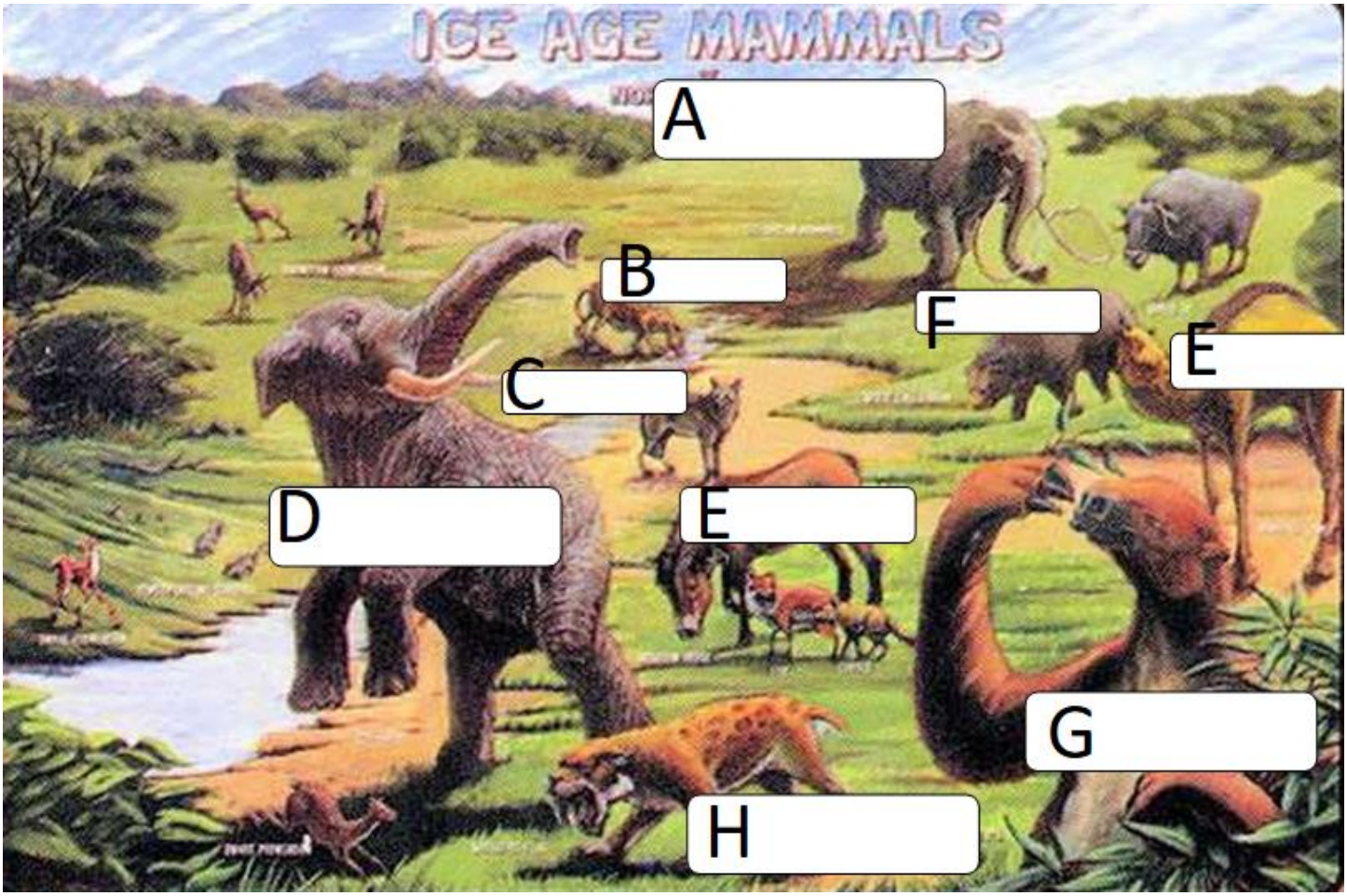


Answer=

Glacial erratic: A piece of rock carried by glacial ice some distance from the rock outcrop from which it came. The glacier carried the boulder and then it gently came to rest as the ice around it melted. It is shaped the way it is because it the glaciers moves the rock through the sediment load wearing away one side. The rock flips and then theothers side becomes chiseled.

Please name some of the ice age mammals below.

A=Wooly Mammoth	B=N. American Cheetah	C=Dire Wolf
D=Mastadon	E=N. American Horses	F=N. American Camel
G=Giant Sloth	H=Smilodon / Saber toothed Cat	Other? Stag Moose, Condor

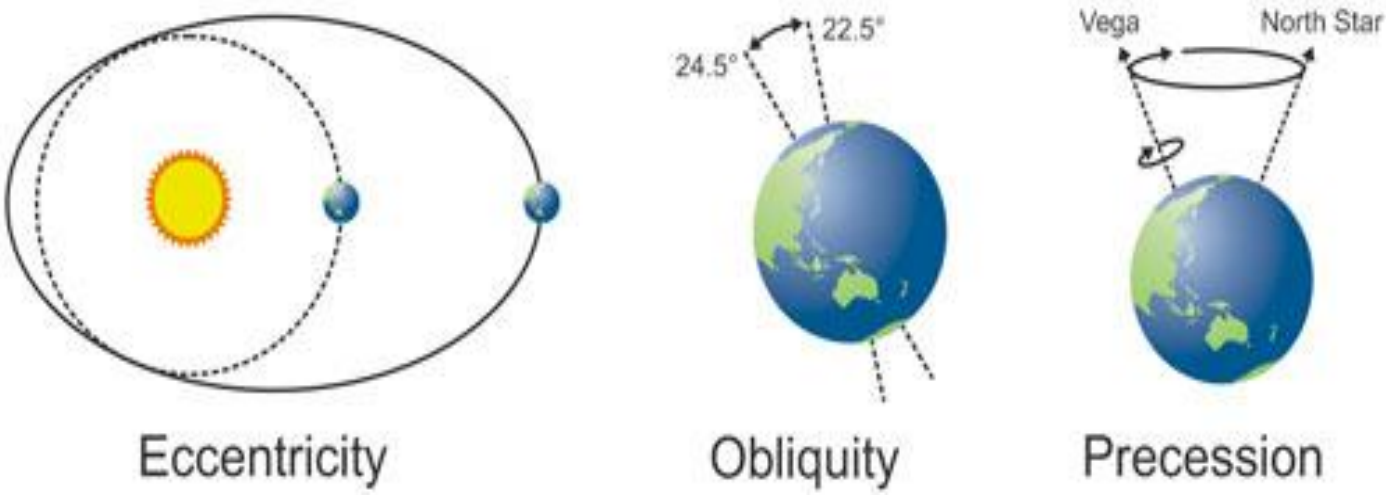


Why do ice ages occur? Think Milankovitch! Use the visuals below to help you for a response.

Response=

The onset of an ice age is related to the Milankovitch cycles – This included eccentricity, obliquity, and precession. These cause regular changes in the Earth's tilt and orbit and combine to affect which areas on Earth get more or less solar radiation. When all these factors align so the northern hemisphere gets less solar radiation in summer, an ice age can be started. Eccentricity occurs every 100,00 years, precession is 26,000 years, and tilt/obliquity is 41,000 years

Milankovitch Cycles



- Milankovitch Cycles
  - Eccentricity (100,000 year cycle)
  - Axial Tilt (41,000 year cycle)
  - Precession (26,000 year cycle)

Maunder Minimum: A period roughly spanning 1645 to 1715 when sunspots became exceedingly rare, as noted by solar observers of the time.

- Fewer sun spots = less solar radiation.
- This lead to a cooler period on Earth / Little Ice Age. (Theory)

Glacial Landforms

Glacial erratic: A piece of rock carried by glacial ice some distance from the rock outcrop from which it came.

Talus – Piles of weathered glacial rock.

Cairn: Manmade pile of stones, usually conical, and often marks the path of an alpine trail.

Glacial Striations: Multiple, straight parallel lines which represent the movement of the sediment loaded base of a glacier.

U-Shaped Valley: Glaciers carve valleys into a U shape.

Fjord: U-Shaped valley near the sea

Kettle Lake : A depression filled with water left by a glacier.

Tarn: A glacial lake produced by scouring. These are often found in cirques.

Horn - A sharp peak on a mountain cut by glaciers.

Cirque - a steep-sided carve into a mountain by a glacier.

Aret'e- A knife edge caused by glaciers and erosion.

Esker- A narrow, steep-sided ridge of sediment, the remains of sediment piling up in a winding river under the glacier.

Moraine- Material transported by a glacier and then deposited. Many types of Moraines.

Drumlins: Formed glacial till (sediment). They are elongated features that can reach a kilometer or more in length.

Outwash - Material deposited by the debris -laden glacial valley.

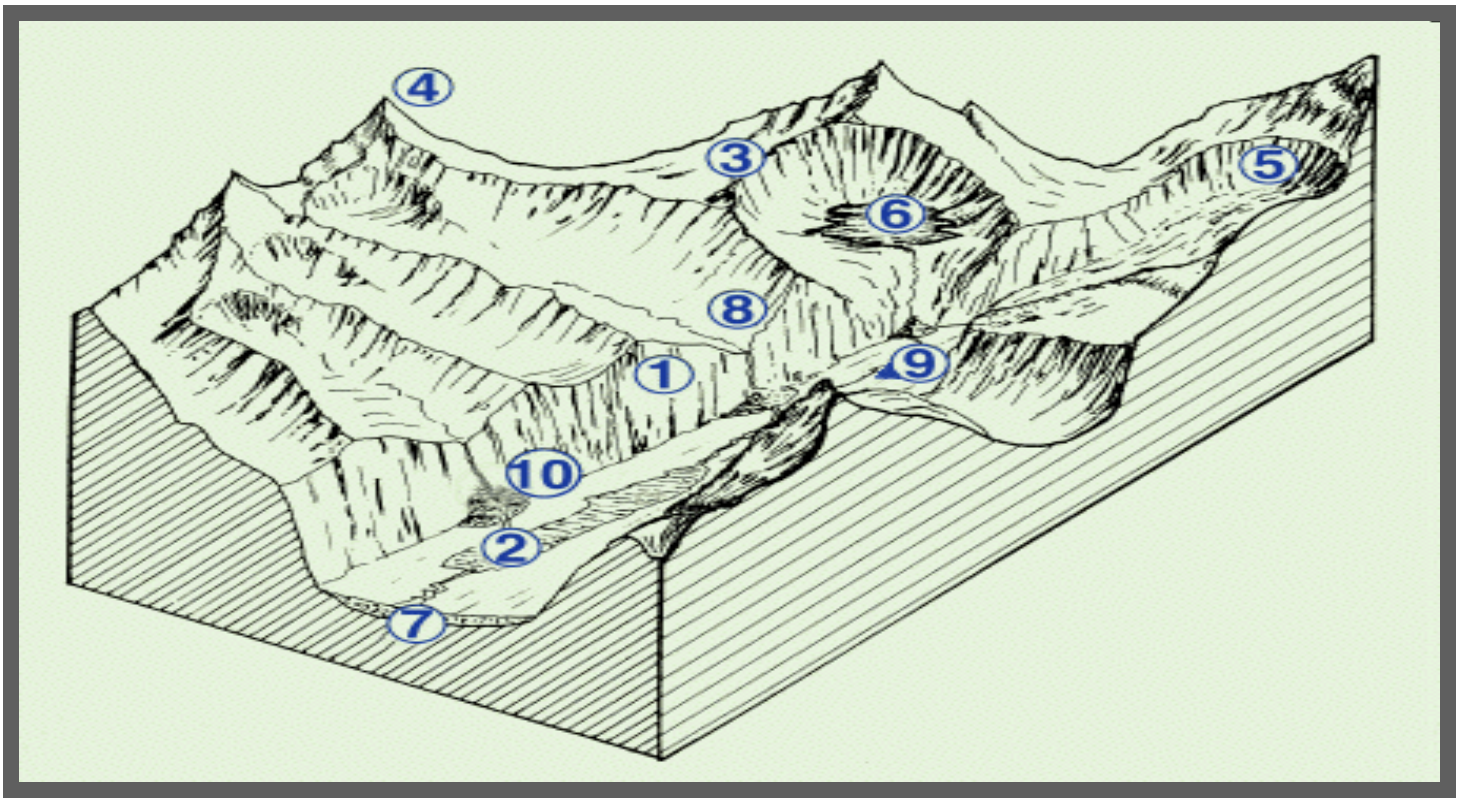
Please identify and **<u>then describe</u>** the specific type of the glacial landforms below. In some cases more than one can be identified.

 U-Shaped Valley: Glaciers carve valleys into a U shape.	 Glacial Striations: Multiple, straight parallel lines which represent the	 Horn - A sharp peak on a mountain cut by glaciers.

	movement of the sediment loaded base of a glacier.	

 Glacial Lake: A depression filled with water left by a glacier.	 Fjord: U-Shaped valley near the sea	 Tarn: A glacial lake produced by scouring. These are often found in cirques. Cirque - a steep-sided carve into a mountain by a glacier.
 Drumlins: Formed glacial till (sediment). They are elongated features that can reach a kilometer or more in length.	 Esker- A narrow, steep-sided ridge of sediment, the remains of sediment piling up in a winding river under the glacier.	 Moraine- Material transported by a glacier and then deposited. Many types of Moraines.

Name the Glacial Landform 1-10



1) Truncated Spure	2 Esker?	3 Arete'	4 Horned Peak	5 Cirque
6 Tarn	7 End Moraine (Outwash?)	8 U-Shaped Valley	9 Esker?	10 Hanging Valley

Find and circle words associated with soil, weathering, ice ages, and glaciers. 30+ can be found! They can go forward and backwards.

EROGSOILGHYLMECHANICALWEATHERINGUGHQMSCHEMICALGH

O


EROGSOILGHYLMECHANICALWEATHERINGUGHQMSCHEMICALG
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IDLWFRFROSTWEDGINGMGARCHHGLOROOTWEDGINGHEMOLEKH
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TGFOLIATIONHNMOMUHOYRPRCKSVHKTHERMALEXPANSIONYTW
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ETYEMYEAREOXIDATIONHUSTALAGMITERTILOVEOFESITHJSOI
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ISOSSLUMPHDIRTMNBOULDERJHYCOBBLEMNFGGRAVELIYPPEERC
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NEVERWANTTODOSOMETHINGLIKETHISEVERAGAINANDIAMSOG
L
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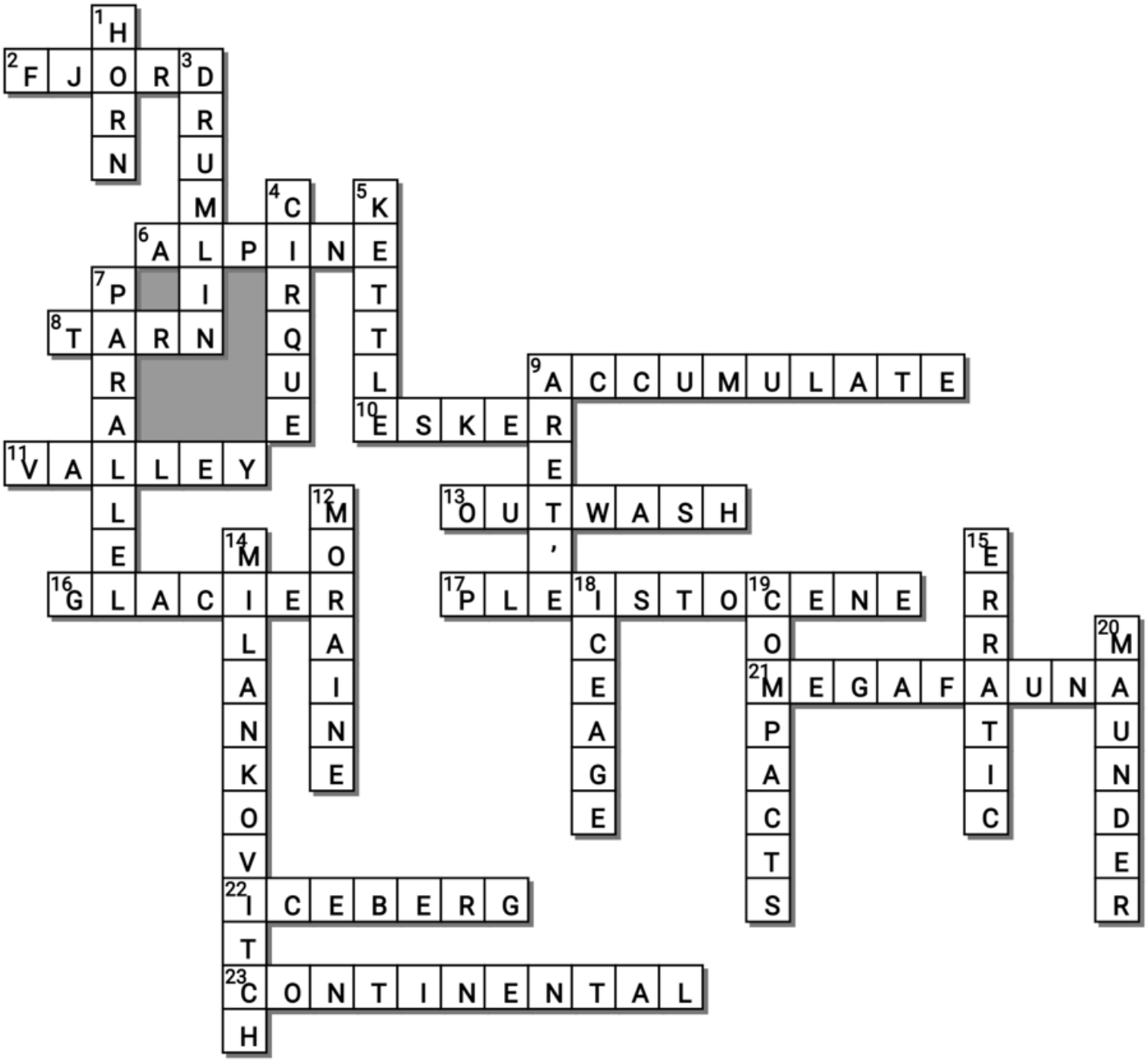
1 H
2 F J O R 3 D
R R
N U
M 4 C 5 K
6 A L P I N E
7 P I R T
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E A P T U
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22 I C E B E R G T E
T S R
23 C O N T I N E N T A L
H

Across

2. U-Shaped valley near the sea
6. _____ Glaciers: A glacier that starts in a mountain and moves into a valley
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Down

1. A sharp peak on a mountain cut by glaciers.
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20. _____ Minimum: A period roughly spanning 1645 to 1715 when sunspots became exceedingly rare, as noted by solar observers of the time.

----------Teacher can remove this word bank to make puzzle more challenging----------

Possible Answers

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Ice Ages and Glaciers Quiz

Name:

Due: Today

1-20 = 5 pts
*20-*25 * = Bonus + 1 pt,
(Secretly write owl in correct space +1 pt)
Final Question = 5 pt wager

Score ____ / 100

SOMETHING CHILLY	PALEO ECOLOGY	THAT LOOKS COOL	THAT's WHAT THAT IS	CHILLED Bonus round 1 pt each
1) GLACIER	6) WOOLY MAMMOTH	11) GLACIAL ERRATIC (Owl+1)	16) FJORD	*21) YUKON CORNELIUS
2) ICEBERG	7) SMILODON or SABER TOOTHED CAT	12) TALUS SLOPE	17) KETTLE LAKE	*22) SLUSH PUPPY
3) ICE AGE	8) TAR PITS	13) CAIRN	18) 1=Cirque 2=Horned Peak 3=Tarn	*23) CHRONICLES of NARNIA.. Lion..
4) Letter C Maunder Minimum	9) SEA-LEVEL	14) GLACIAL STRIATIONS	19) MORAINE	*24) HOTH
5) Milankovitch Cycle Eccentricity Precession Obliquity/Tilt	10) CLIMATE CHANGE /GLOBAL WARMING	15) U-SHAPED VALLEY	20) DRUMLINE	*25) BEN & JERRY's

Final Question Wager ___ /5 Answer: E.)Glacial Lake Missoula