

SI Geology - Full Discipline Demo

Glacial Processes and Landforms

Final Report - Answer Guide

Institution	Science Interactive University
Session	SI Geology - Full Discipline Demo
Course	SI Geology - Full Discipline Demo
Instructor	Sales SI Demo

Test Your Knowledge

Place the steps of glacier formation in order from first to last.

≡ Air is gradually forced out, causing the mass to become even denser, forming glacial ice.

1 **Correct answer:** Fresh snowflakes fall and begin to accumulate.

≡ Fresh snowflakes fall and begin to accumulate.

2 **Correct answer:** The increasing weight of accumulating snow pushes the flakes together to form granular snow.

≡ The buried snow melts and refreezes into firn.

3 **Correct answer:** The buried snow melts and refreezes into firn.

≡ The increasing weight of accumulating snow pushes the flakes together to form granular snow.

4 **Correct answer:** Air is gradually forced out, causing the mass to become even denser, forming glacial ice.

Classify each statement as true or false.

⚡ A kame is a long, winding ridge of gravel and other sediment deposited by meltwater from a retreating glacier.	
⚡ Kettle lakes are depressions filled with water left behind after partially buried ice blocks melt.	
⚡ Large boulders left behind by retreating glaciers are called erratics.	
⚡ Parallel ridges of debris deposited along the sides of a glacier as it scrapes along valley walls are called medial moraines.	
⚡ Terminal moraines are ridges, mounds, or irregular masses of unstratified glacial drift, mainly composed of boulders, gravel, sand, and clay.	
True	False
1	2

Correct answers:

1

Kettle lakes are depressions filled with water left behind after partially buried ice blocks melt.

Large boulders left behind by retreating glaciers are called erratics.

Terminal moraines are ridges, mounds, or irregular masses of unstratified glacial drift, mainly composed of boulders, gravel, sand, and clay.

2

A kame is a long, winding ridge of gravel and other sediment deposited by meltwater from a retreating glacier.

Parallel ridges of debris deposited along the sides of a glacier as it scrapes along valley walls are called medial moraines.

Exploration

The amount of trapped air increases during glacial ice formation.

- ☐ True
- ☒ False ✓

The portion of the glacier where melting exceeds accumulation is called the zone of ____.

- ☒ ablation ✓
- ☐ accumulation
- ☐ equilibrium
- ☐ terminus

____ occurs when glaciers pick up pieces of larger rocks from the surface and carry them along as the glacier moves.

- ☐ Freeze-thaw weathering
- ☒ Plucking ✓
- ☐ Abrasion
- ☐ Retreating

Which type of moraine is rarely preserved after glacial ice retreats?

- ☐ Lateral moraine
- ☐ End moraine
- ☒ Medial moraine ✓
- ☐ Terminal moraine

Narrow coastal valleys located below sea level that fill with seawater when glaciers retreat are called ____.

- ☒ fjords ✓
- ☐ eskers
- ☐ kames
- ☐ kettle lakes

Exercise 1

How do you distinguish the landform in Location C from a glacier?

How do the features in Location D form?

What do you expect the features at Location E to be composed of, and what grain sizes would you expect?

Which is more likely to preserve the feature at Location F: an advancing or a retreating glacier? Why?

How do the features at Location G form?

How are the landforms at Location J distinguished from those carved out by rivers?

What distinguishes the feature at Location K from Location J?

Data Table 1: Glacial Landforms
(SAMPLE ANSWER BELOW)

Location	Name of Feature
A	Alpine Glacier
B	Continental Glacier
C	Iceberg
D	Medial Moraines
E	Lateral Moraines
F	Terminal (End) Moraine
G	Kettle Lakes
H	Esker
I	Drumlins
J	U-Shaped Valley (Glacial Valley)
K	Fjord
L	Glacial Horn (Pyramidal Peak)

Competency Review

The ____ is a point on the glacier where ablation and accumulation balance each other.

- ☐ kern
- ☐ terminus
- ☐ esker
- ☒ firn line

✓

Glacial striations are formed through what process?

- ☐ Plucking
- ☒ Abrasion
- ☐ Freeze-thaw weathering
- ☐ Calving

✓

Alpine glaciers are typically formed at high elevations and are confined to a valley.

- ☒ True
- ☐ False

✓

What type of glacial landform is pictured here?



- ☐ Drumlin
- ☐ Kame
- ☐ Esker
- ☒ Braided stream

✓

____ contributes to the formation of glacial erratics by wedging blocks of rock from their resting place, allowing them to be carried away by a glacier.

- ☒ Freeze-thaw weathering
- ☐ Abrasion
- ☐ Calving
- ☐ Plucking

✓

What type of glacial landform is pictured below?



- ☐ Kern
- ☒ Kettle lake
- ☐ Esker
- ☐ Drumlin

Medial moraines are parallel ridges of debris deposited along the sides of a glacier as it scrapes along valley walls.

- ☐ True
- ☒ False

_____ are long, winding ridges of gravel and other sediment deposited by meltwater from a retreating glacier.

- ☒ Eskers
- ☐ Kames
- ☐ Drumlins
- ☐ Fjords

During glacial retreat, a glacier still deforms and moves downslope.

- ☒ True
- ☐ False



Extension Questions

Minnesota is known as the "Land of 10,000 Lakes." To be precise, there are 11,842 lakes within the state. Explain how glaciers may have contributed to Minnesota earning this nickname. (SAMPLE ANSWER BELOW)

Minnesota, as well as much of Canada, was covered by a continental glacier up until approximately 10,000 years ago. When the glacier retreated for the final time, it created thousands of kettle lakes, thus resulting in Minnesota having the name "Land of 10,000 Lakes."