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Skills Worksheet

Concept Review

In the space provided, write the letter of the description that best matches the term or phrase.

_____ 1. snowfield	a. a narrow glacier formed in a mountainous region
_____ 2. ice shelf	b. part of an ice sheet that moves over the ocean
_____ 3. cirque	c. a wobble in Earth's axis
_____ 4. esker	d. a large rock transported by a glacier from a distant source
_____ 5. glacier	e. the process by which glaciers flow as ice grains deform under pressure and slide over each other
_____ 6. internal plastic flow	f. a bowl-shaped depression formed by glacial erosion
_____ 7. erratic	g. a long, winding ridge of stratified drift
_____ 8. interglacial period	h. a large mass of moving ice
_____ 9. precession	i. an almost motionless mass of permanent snow and ice
_____ 10. alpine glacier	j. a period of warmer climate during which glaciers retreat

In the space provided, write the letter of the answer choice that best completes each statement or best answers each question.

_____ 11. Which of the following features form when tension and compression build under the surface of a flowing glacier?
- a. crevasses
- b. ice shelves
- c. kettles
- d. roches moutonnées

_____ 12. Ice in a glacier moves downslope in response to
- a. friction.
- b. melting.
- c. gravity.
- d. freezing.

_____ 13. Which of the following features is caused by erosion rather than by deposition?
- a. drumlin
- b. kettle
- c. esker
- d. horn

_____ 14. A moraine is an example of a(n)
- a. sorted glacial deposit.
- b. unsorted glacial deposit.
- c. erosional feature caused by moving ice.
- d. erosional feature caused by moving water.

_____ 15. Which of the following are needed to form a salt lake?
- a. periods of low temperatures
- b. high precipitation rates
- c. multiple outlet streams
- d. rapid evaporation rates

_____ 16. Where has evidence of past glaciation been found?
- a. in outwash plains
- b. in glacial crevasses
- c. on mountaintops
- d. in shells of dead marine animals

_____ 17. What is till?
- a. sorted deposits of rock material
- b. unsorted glacial drift
- c. sorted deposits of sand
- d. sediment sorted by melted ice

_____ 18. Which of the following probably occurs before an ice age begins?
- a. longer interglacial periods
- b. a rise in sea level
- c. a slow drop in global temperatures
- d. a decrease in precipitation

_____ 19. Which of the following does the Milankovitch theory consider to be factors in the cause of glacial periods?
- a. changes in the amount of radiation produced by the sun
- b. blockage of the sun's rays by volcanic dust
- c. movement of continents, which affects warm ocean currents
- d. small changes in Earth's orbit, tilt, and precession

_____ 20. Which of the following occurs when a glacier moves by basal slip?
- a. A glacier's weight melts ice where it touches the ground.
- b. Meltwater flows beneath a glacier.
- c. Deformed grains of ice slide over each other.
- d. Warmer temperatures at the glacier's surface melt ice.

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Skills Worksheet

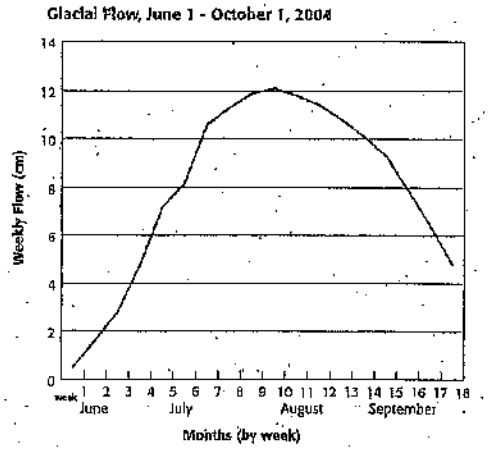
Graphing Skills

Line Graphs

In laboratory experiments, you will usually control one variable to determine how it affects another variable. But in real-world inquiries, it may not be possible to control either variable, which is the case when studying glaciers. For example, to determine the effect of increased solar energy in summer on the flow of alpine glaciers, neither variable can be controlled.

However, data can still be collected to determine how one factor influences the other. A line graph can show this relationship clearly. For instance, a researcher might track the movement of an alpine glacier over time to determine the effect of summer warming on its flow. The graph below provides sample data for a hypothetical alpine glacier's flow from June 1 through October 1, 2004. Suppose a researcher simply recorded the glacier's advance each week for that period of time, using a stake planted in the glacier's center and measurements against a fixed point in the valley wall.

The independent variable—the dates, in this case—is plotted on the *x*-axis. The dependent variable is plotted on the *y*-axis. This axis shows glacier flow and has a range of 2.0 to 15.0 m. When graphing data, be sure to properly label each axis, including the units.



PRACTICE

Use the line graph above to answer the following questions.

1. During which week(s) did the glacier's flow increase the most? By approximately what amount did it increase?

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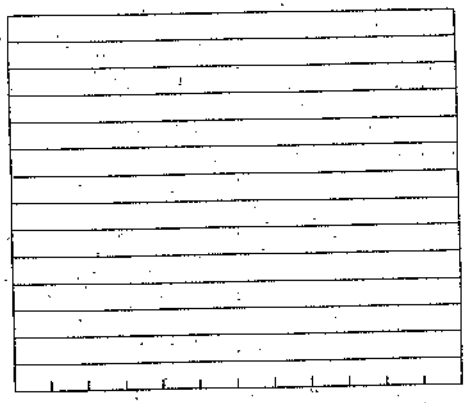
2. Based on this graph, how do you think the line for October would look? Explain your answer.

3. In the data table below, is the mean daily movement of the same hypothetical alpine glacier over a 12-year period? Use this information to make a line graph on the grid below. Be sure to properly label each axis, including the units.

Year	Daily Flow (cm)	Year	Daily Flow (cm)
1992	1.3	1998	48.6
1993	0.9	1999	66.7
1994	0.8	2000	43.6
1995	2.0	2001	26.3
1996	9.7	2002	10.2
1997	18.1	2003	2.8



4. For this graph, which variable is the independent variable? On which axis would you plot this data?

5. Why might a scientist choose to use years rather than a lesser measure (like days or hours) as the dependent variable? Explain your answer.

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Assessment

Section Quiz

Section: Moving Ice

MATCHING

In the space provided, write the letter of the definition that best matches the term or phrase.

_____ 1. continental glacier
_____ 2. internal plastic flow
_____ 3. alpine glacier
_____ 4. crevasse
_____ 5. basal slip

a. a crack or fissure in a glacier
b. the process that causes the ice at the base of a glacier to melt and the glacier to slide
c. a massive sheet of ice not confined by topography
d. a narrow mass of ice confined by topography
e. the process by which glaciers flow slowly as grains of ice deform under pressure and slide over each other

MULTIPLE CHOICE

In the space provided, write the letter of the answer choice that best completes each statement or best answers each question.

_____ 6. When new snow is added to a glacier faster than ice and snow melt, the glacier
a. gets larger.
b. stays the same size.
c. gets smaller.
d. gets larger, then smaller.

_____ 7. What is the grainy ice that forms when snow melts and refreezes called?
a. flan
b. fur
c. firn
d. firm

_____ 8. An iceberg is a large block of ice that breaks away from a(n)
a. ice pack.
b. ice shelf.
c. landmass.
d. ice block.

_____ 9. A massive sheet of ice that may cover millions of square kilometers is a(n)
a. alpine glacier.
b. ice slick.
c. land mass.
d. continental glacier.

_____ 10. A continental glacier is also called a(n)
a. snowfield.
b. iceberg.
c. ice sheet.
d. ice shelf.

Name _____ Class _____ Date _____

Assessment

Section Quiz

Section: Glacial Erosion and Deposition

MATCHING

In the space provided, write the letter of the definition that best matches the term or phrase.

_____ 1. erratic
_____ 2. horn
_____ 3. moraine
_____ 4. arête
_____ 5. kettle

a. a sharp, pyramid-shaped peak formed by glacial erosion
b. a large rock transported from a distant source by a glacier
c. a steep depression in a glacial drift deposit
d. a jagged ridge that forms between cirques
e. a ridge of unsorted sediment formed by glacial deposition

MULTIPLE CHOICE

In the space provided, write the letter of the answer choice that best completes each statement or best answers each question.

_____ 6. A lake basin can form when a continental glacier leaves depressions
a. in the ice mass.
b. in roches moutonnées.
c. in eskers.
d. in bedrock.

_____ 7. Glacial lakes can form in the uneven surface of
a. ground moraines.
b. the continental glacier.
c. mountains.
d. valleys.

_____ 8. A deep, bowl-shaped depression formed by glacial erosion is called a(n)
a. ice pack.
b. arête.
c. cirque.
d. kettle.

_____ 9. Sediment carried and deposited by glaciers is called
a. continental drift.
b. glacial drift.
c. ice drift.
d. galactic drift.

_____ 10. Tear-shaped mounds of sediment formed by glacial deposition are called
a. till.
b. kettles.
c. cirques.
d. drumlins.

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Assessment

Section Quiz

Section: Ice Ages

MATCHING

In the space provided, write the letter of the definition that best matches the term or phrase.

_____ 1. interglacial period

_____ 2. ice age

_____ 3. precession

_____ 4. glacial period

_____ 5. eccentricity

a. the wobble of Earth's axis

b. the change of the shape of Earth's orbit from circular to elongated and back again

c. a colder climatic period of glacial advance

d. a period of climatic cooling during which glaciation repeats

e. a warmer climatic period of glacial retreat

MULTIPLE CHOICE

In the space provided, write the letter of the answer choice that best completes each statement or best answers each question.

_____ 6. Which of the following explains the principle behind the Milankovitch theory?
- **a.** The amount of solar radiation that Earth absorbs is constant.
- **b.** The amount of solar radiation the sun receives varies.
- **c.** The amount of solar radiation the sun receives is constant.
- **d.** Cyclical changes in Earth's orbit and in the tilt of its axis cause climatic changes.

_____ 7. Earth's most recent ice age began approximately how long ago?
- **a.** 800 million years ago
- **b.** 4 million years ago
- **c.** 15,000 years ago
- **d.** 10,000 years ago

_____ 8. The Milankovitch theory attempts to explain
- **a.** patterns of weather.
- **b.** causes of glacial periods.
- **c.** global warming.
- **d.** how the Great Lakes formed.

_____ 9. Evidence of past glaciation has been found by studying
- **a.** volcanic dust.
- **b.** seahorse activity.
- **c.** Foraminifera shells.
- **d.** seaweed.

_____ 10. According to the Milankovitch theory, which of the following factors affect the solar energy reaching Earth's surface?
- **a.** clouds, ice, and glaciers
- **b.** eccentricity, erratics, and precession
- **c.** eccentricity, tilt, and precession
- **d.** tilt, angle, and slope