Name \_\_\_\_\_ Day, Time \_\_\_\_\_

Date \_\_\_\_\_

Late Pleistocene Extinction

* Approximately \_\_\_\_\_ years ago, many animals went extinct across North America (this happened towards the end of the Pleistocene epoch).
* Before this extinction occurred, many of the animals that existed in North America were \_\_\_\_\_ (in size and diversity) to animals in \_\_\_\_\_-day Africa.
* These animals were referred to as “\_\_\_\_\_” which means “large animals.”
* Although scientists don’t exactly know the cause of extinction, they have identified three mechanisms which may have caused the extinction:

(1) Human \_\_\_\_\_

(2) \_\_\_\_\_ causes related to climate change,

(3) \_\_\_\_\_ (highly infectious disease)

We are in an Ice Age right now! Glaciers are \_\_\_\_\_ today.

* When the \_\_\_\_\_ ice caps cover a smaller area, such as present day, it is referred to as an \_\_\_\_\_ period.
* When the polar ice caps cover a larger area, it is referred to as a \_\_\_\_\_ period.

An ice age consists of two parts that make up one Milankovitch cycle:

(a) Glacial period (\_\_\_\_\_ with at least one polar ice cap),

(b) Interglacial period (\_\_\_\_\_)

90% of the Earth’s history, no polar ice caps were present. There have been \_\_\_ major ice ages:

* 2 billion years ago
* 840 million years ago (lasted for 240 million years!)
* 2 ice ages (during the Paleozoic era)
* Present ice age (began approximately \_\_\_ million years ago)

It is unclear what causes Ice Ages to occur, but current theories point to the changing position of the continents which causes:

* 1. \_\_\_\_\_ building events
	2. Different global \_\_\_\_\_ patterns
	3. Different global \_\_\_\_\_ current patterns
	4. Amount of \_\_\_\_\_ spreading (effects sea level)

The Ice Age Theory as described by Serbian scientist, Milutin Milankovitch, points to three variations in the earth-sun geometry:

E\_\_\_\_\_ – stretching of earth’s orbit (100,000 year cycle)

O\_\_\_\_\_ – change of the earth’s axial tilt (41,000 year cycle)

P\_\_\_\_\_ – “wobble” of the earth’s axis of rotation (~26,000 year cycle)

Eccentricity



* The shape of Earth’s orbit is like a “stretched out” circle or an oval or “\_\_\_\_\_”
* Scientists use a \_\_\_\_\_ to describe this, and call it the eccentricity of the ellipse.

Obliquity



* Also known as axial \_\_\_\_\_ which is the angle between an object's rotational axis and its orbital axis
* Axial tilt affects the distribution of \_\_\_\_\_ radiation on Earth’s surface
* When tilt is decreased, polar regions receive \_\_\_\_\_ sunlight. When tilt is increased, polar regions receive \_\_\_\_\_ sunlight.
* The earth’s axial tilt varies from \_\_\_\_\_° to \_\_\_\_\_\_° at periods close to 41,000 years

Precession

* The Earth's \_\_\_\_\_ axis is not fixed in space.
* Like a rotating toy top, the direction of the rotation axis executes a slow precession with a period of \_\_\_\_\_ years.
* Is a change in the \_\_\_\_\_ of the rotational axis of a rotating body.
* Precession affects how severe or moderate the \_\_\_\_\_ are depending on which portion of the “\_\_\_\_\_” the earth is on.
* For example, you could have a cool summer which allows \_\_\_\_\_ in higher latitudes to last throughout the summer.

Paleoclimatology

* The study of ancient \_\_\_\_\_.
* Using \_\_\_\_\_ core samples, \_\_\_\_\_ core samples, \_\_\_\_\_ ring and \_\_\_\_\_ samples, scientists can piece together some of the history of the earth’s climate.

Label the type of sample over the top of each picture.

 ? ? ?



Graphs

* Note the many years of \_\_\_\_\_ climate than today.
* \_\_\_\_\_ periods are warmer and last 10-15,000 years
* \_\_\_\_\_ periods are when ice \_\_\_\_\_ expand & last 50-100,000 years

**Glaciers and Glaciation**

Types of Glaciers

A\_\_\_\_\_ – Formed in mountainous areas; relatively small in size.

C\_\_\_\_\_ – large expansive ice sheets (these cover Antarctica and Greenland today); these are the glaciers we will be studying.

What forms a glacier?

* Ice is formed from \_\_\_\_\_ snow
* Individual flakes of snow turn to \_\_\_\_\_ chunks of icy material
* As more snow falls, the pressure \_\_\_\_\_ the layers of the icy snow
* When the glacier gets big enough, ice at the base \_\_\_\_\_ and the glacier \_\_\_\_\_



Using Maps to Identify Glacial Features

* T\_\_\_\_\_ Maps show lines called \_\_\_\_\_. These lines connect equal areas of elevation.
* Areas that have contour lines \_\_\_\_\_\_\_\_\_ together indicate that there is a greater change in \_\_\_\_\_ in a short distance (either up or down).
* Notice the contour lines that make \_\_\_\_\_ circles … they are closer together

Formation of the Great Lakes

* During the last glacial period, lobes of \_\_\_\_\_ carved their way into softer sediment over this region of North America.
* When the climate warmed, the glacier \_\_\_\_\_, and melted into the \_\_\_\_\_ left by the ice lobes, creating the great lakes.

I\_\_\_\_\_ Rebound

* Due to the \_\_\_\_\_ weight of the ice sheet, the \_\_\_\_\_ of the earth was pushed deeper into the asthenosphere in the locations where the ice was.
* As the glacial sheet \_\_\_\_\_ back, the lithosphere began to slowly “\_\_\_\_\_” back up – and still is adjusting back up.
* For this reason, the great lakes drain to the \_\_\_\_\_ and east, out the St. Lawrence River to the \_\_\_\_\_ Ocean.

Graph 1 What does the zero line on the graphs represent? Why would this number be used?

*

Describe in words the average global temperature for the past 2,400 years compared to the zero line.

*

Graph 2 … Describe the significance of graph #2.

*

Graph 3 From approximately 100,000 years ago to 15,000 years ago the earth’s temperature was below the “normal” temperature. What is this period?

*

Graph 4 What is the pattern in graph #4? According to the pattern, how should the earth’s temperature change in the next 1,000 – 3,000 years?

*

What is a significant difference between glacial periods and interglacial periods?

*
*

Graph 5 Describe the significance of graph #5. How has the earth’s climate changed over the past 3 million years?