GLACIERS: MOVERS AND SHAPERS

Directions: Using the Earth Science textbook pages 318 – 328 or use the web site: http://nsidc.org/glaciers/story/ answer the following questions.

I. A Tour in the Life of a Glacier

1. Where can glaciers be found?
   ______________________________________________________________________

2. What types of climatic conditions are needed for glaciers to form? ______________
   ______________________________________________________________________

3. What are the two main types of glaciers?
   ______________________________________________________________________
   ______________________________________________________________________

4. What is needed in order for glaciers to survive and grow?
   ______________________________________________________________________

II. The Growing Years

1. Put these steps of glacier formation into the correct order:

   ___ It begins to flow outwards and downwards under the pressure of its own weight.
   ___ The snow turns to ice.
   ___ Snow falls
   ___ Falling snow accumulates over time.

2. What is snow that survives one melt season called?
   ______________________________________________________________________

3. What causes snow and firn to be compressed into a mass of ice?
   ______________________________________________________________________
4. Snow that is compacted by overlying layers turns into __________________________

III. Moving Forward

1. What causes a glacier to begin moving? ____________________________
   ____________________________

2. In which direction do valley (alpine) glaciers move? 
   ____________________________

3. In which direction do continental glaciers move? 
   ____________________________

4. What are two ways that glaciers move? ____________________________
   ____________________________

5. What objects can a glacier move as it travels outward or downward? 
   ____________________________
   ____________________________

6. What does the glacier do with these objects that it moves? 
   ____________________________

7. Name three depositional features created by glacier activity. 
   ____________________________  ____________________________  ____________________________

IV. In Retreat

1. When a glacier retreats, is it moving backwards? ____________________________
   ____________________________

2. How do glaciers retreat? ____________________________

3. What causes a glacier to begin to melt? ____________________________

4. What are three landforms created by glaciers that have retreated or disappeared? 
   ____________________________  ____________________________  ____________________________
Base your answers to the following questions on map A and map B below, and on map C on the next page which show evidence that much of New York State was once covered by a glacial ice sheet. Map A shows the location of the Finger Lakes Region in New York State. The boxed areas on map A were enlarged to create maps B and C. Map B shows a portion of a drumlin field near Oswego, New York. Map C shows the locations of glacial moraines and outwash plains on Long Island, New York.

The arrangement of the drumlins on map B indicates that a large ice sheet advanced across New York State in which compass direction?

The diagrams below represent three sediment samples labeled X, Y, and Z. These samples were collected from three locations marked with empty boxes ( ) on map C. Write the letter of each sample in the correct box on map C to indicate the location from which each sample was most likely collected.

Sample X
Sorted particle-size range: 0.005–0.09 cm

Sample Y
Unsorted particle-size range: 0.01–62 cm

Sample Z
Sorted particle-size range: 0.1–0.3 cm

(Not drawn to scale)
The drawing below shows a glacial erratic found on the beach of the north shore of Long Island near the Harbor Hill moraine. This boulder is composed of one-billion-year-old gneiss. Which New York State landscape region has surface bedrock similar in age to this erratic?

**ANSWER:**

Explain how the effect of global warming on present-day continental glaciers could affect New York City and Long Island.

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