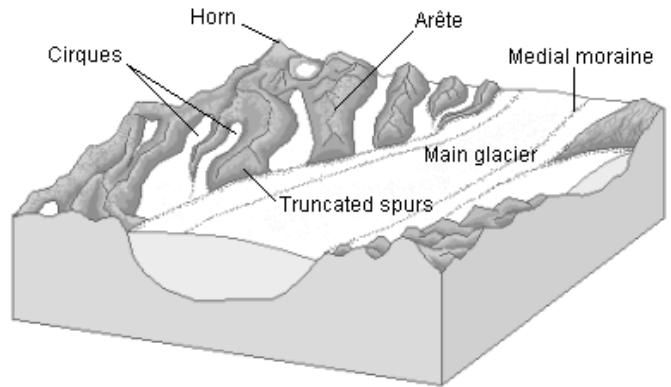


## GLACIERS: MOVERS AND SHAPERS

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 \_\_\_\_\_

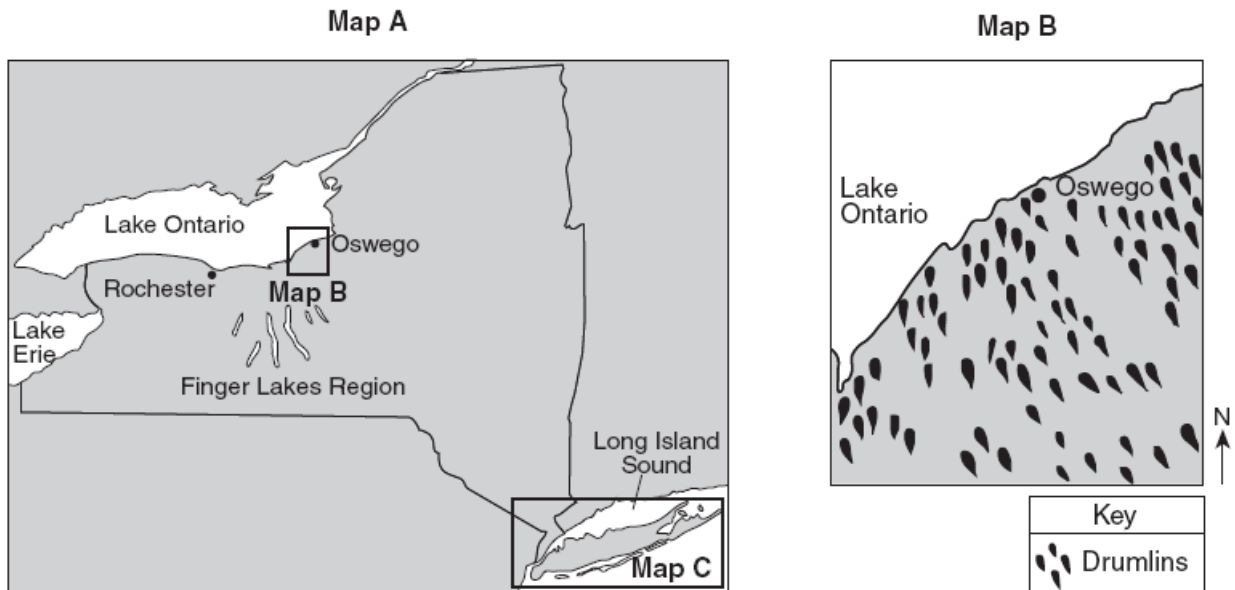
### **III. Moving Forward**

1. What causes a glacier to begin moving? \_\_\_\_\_  
\_\_\_\_\_
2. In which direction to valley (alpine) glaciers move?  
\_\_\_\_\_
3. In which direction to 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**

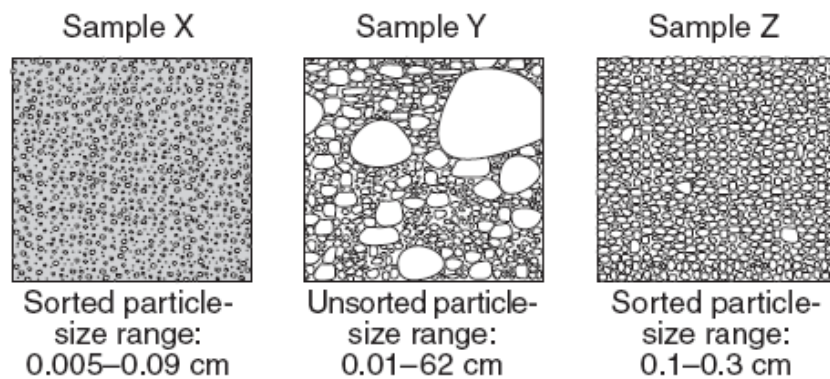
1. When a glacier retreats, is it moving backwards? \_\_\_\_\_  
\_\_\_\_\_
2. How do glaciers retreat? \_\_\_\_\_
3. What causes a glacier to begin to melt? \_\_\_\_\_  
\_\_\_\_\_
4. What are three landforms created by glaciers that have retreated or disappeared?  
\_\_\_\_\_  
\_\_\_\_\_

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.



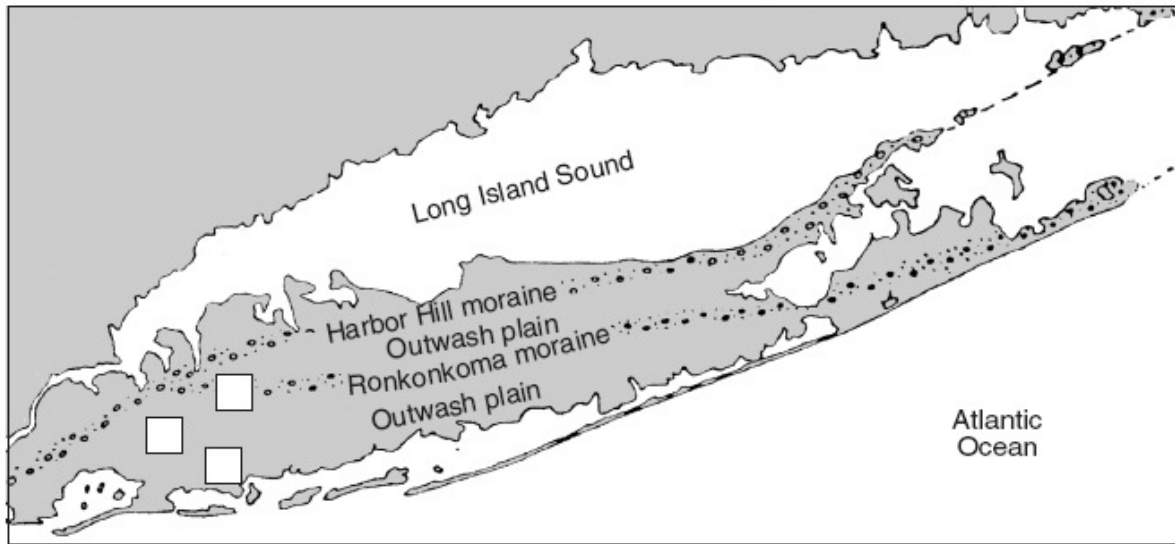
The arrangement of the drumlins on map *B* indicates that a large ice sheet advanced across New York State in which compass direction? \_\_\_\_\_

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.



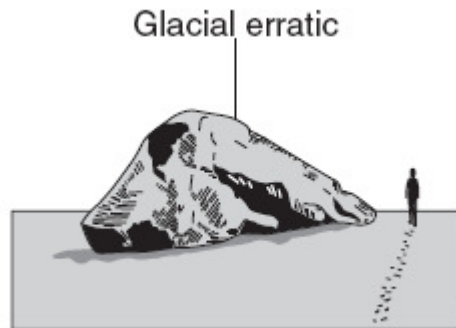
(Not drawn to scale)

Map C



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:



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

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