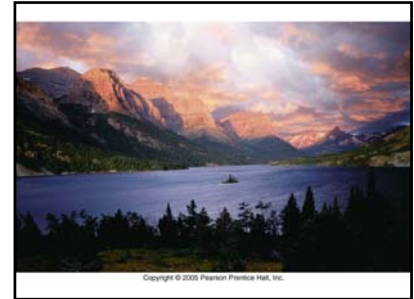
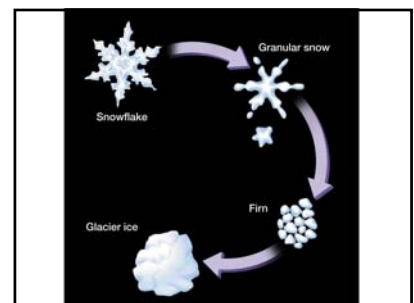
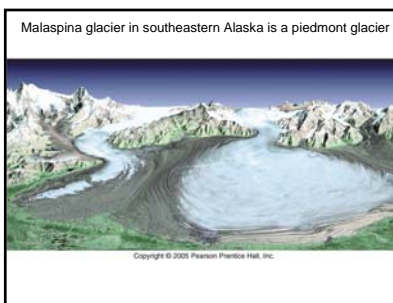
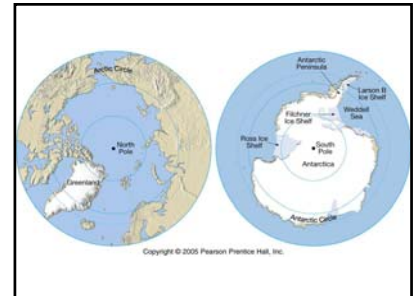
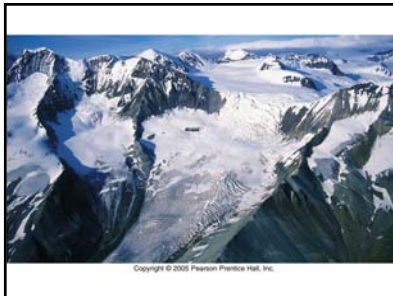


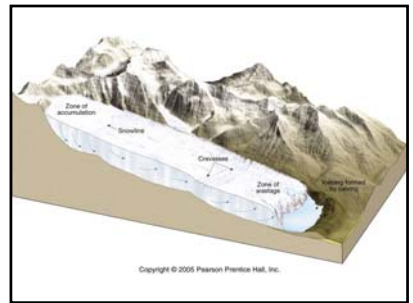
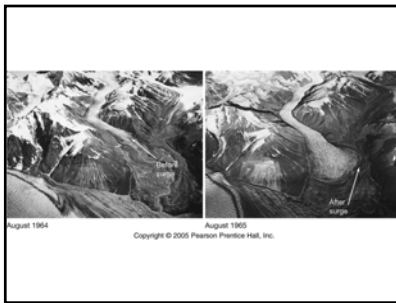
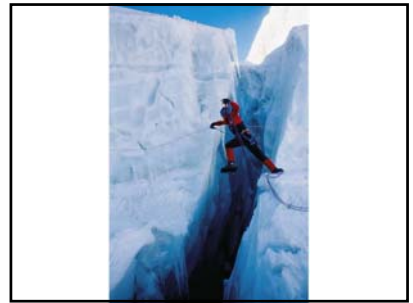
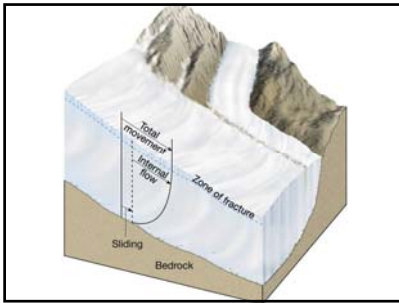
Glaciers and Glaciation

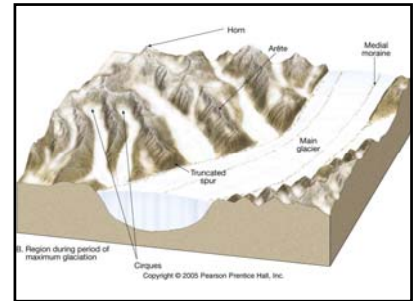
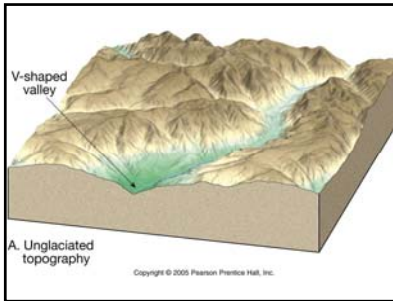


Two main types of glaciers

- Valley glaciers
 - Colder conditions in high altitude mountains keep snowfall from melting away during the summer months
- Ice sheets
 - Cold conditions on land masses at high latitudes allow accumulation of snow

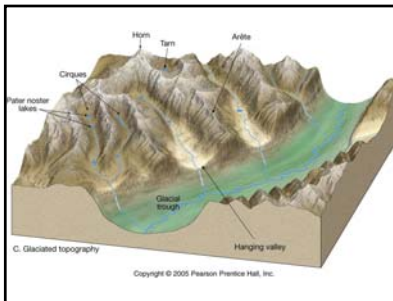
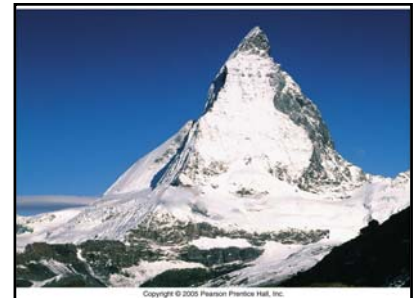
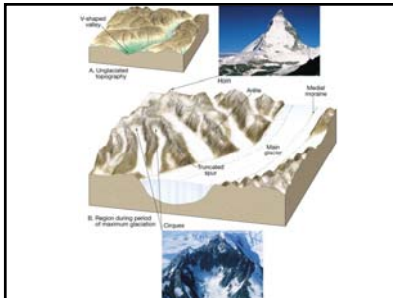






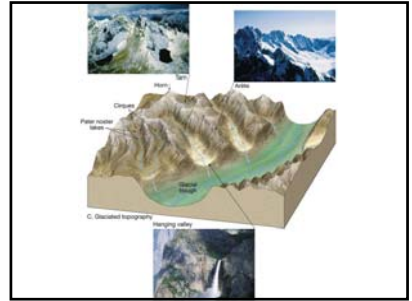
Erosional features

- Horn peaks
- Arêtes
- Cirques
- Glacial valley and hanging valley
- Glacial polish and scour
- Roche moutonnée



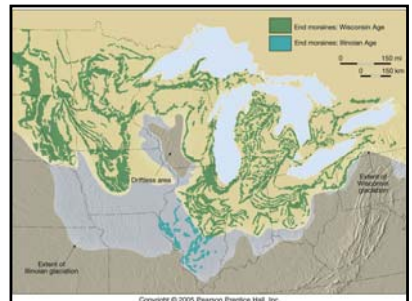
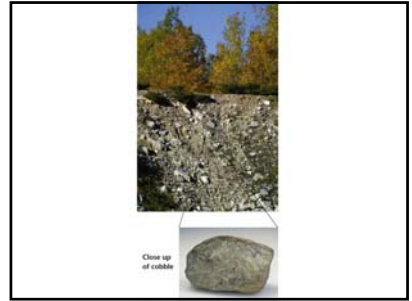
Abrasion

- Ice is 1.5 on the Moh's Scale of Hardness
 - Need fragments of other rock particles to abrade



Depositional features

- Erratics
- Moraines
- Kames
- Eskers
- Till
- Drift



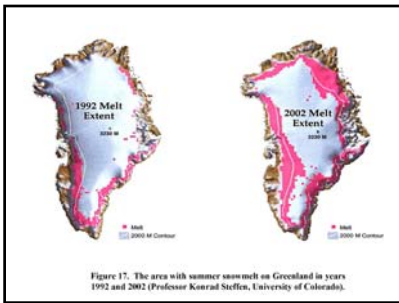
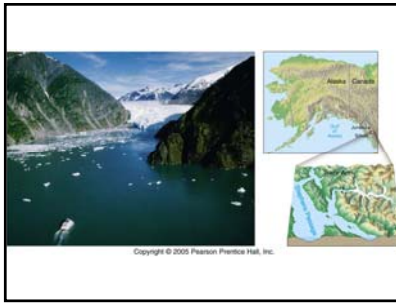
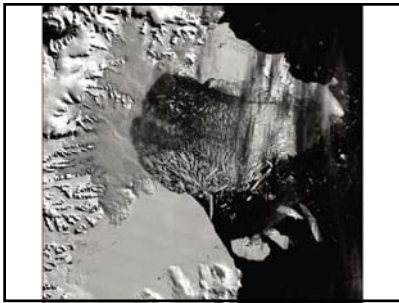
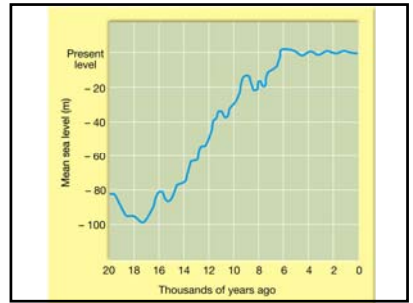
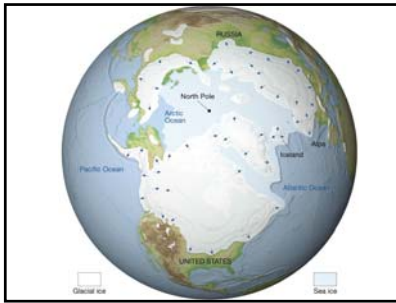
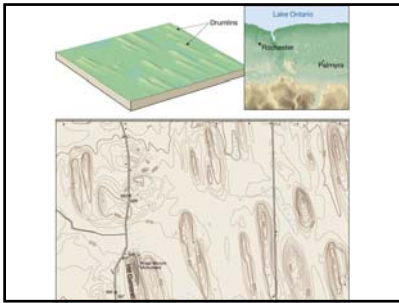
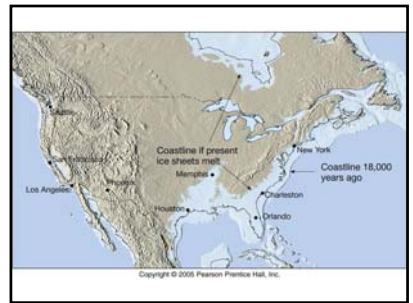
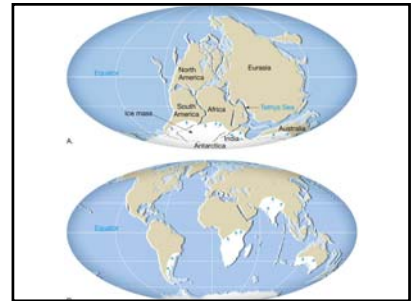
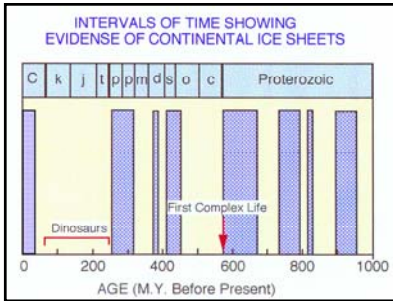
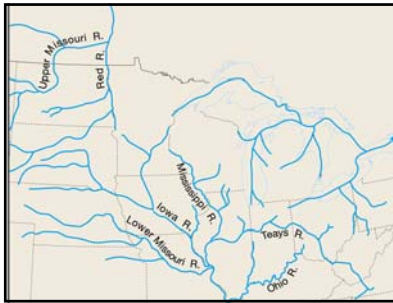
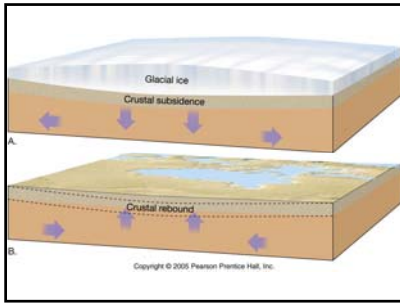


Figure 17. The area with summer snow melt on Greenland in years 1992 and 2002 (Professor Konrad Steffen, University of Colorado).

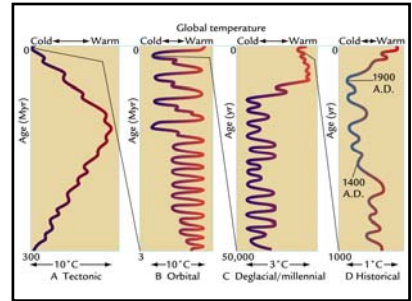


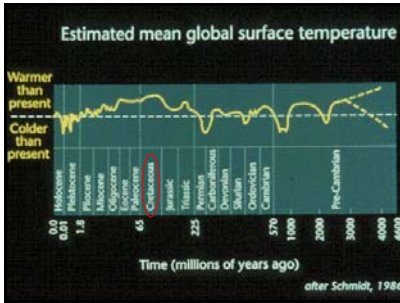


The Ice Age and glacial periods

- We are presently in an ice age that began about 2 Ma.
 - Pleistocene epoch of the Quaternary period of the Cenozoic era.
- The last glacial period began about 75,000 years ago
- We are presently in an interglacial period which we call the Holocene epoch that began 10,000 years ago.

Name	Climate	Time Spanned (years ago)
Wisconsinan	ice age	75,000 - 10,000
Sangamonian	predominantly warm	120,000 - 75,000
Illinoian	ice age	170,000 - 120,000
Yarmouthian	predominantly warm	230,000 - 170,000
Kansan	ice age	480,000 - 230,000
Aftonian	predominantly warm	600,000 - 480,000
Nebraskan	ice age	800,000 - 600,000
pre-Nebraskan	predominantly warm	1,600,000 - 800,000





- ### Causes of Ice ages
1. Plate tectonics
 - Continents grouped over the poles
 2. Reduce greenhouse gas in the atmosphere
 - Bury organic material or increase weathering of continental crust
 3. Changes in the orbit of the Earth around the Sun
 - Milankovitch cycles

