

## Mesozoic Geology

1. Breakup of Pangea, opening of Atlantic Ocean
  - a. Evidence of the rifting and new ocean basin
2. Effects of Pangea breakup
  - a. Sea level, climate, allopatric speciation
3. How to interpret East coast and Gulf coast Mesozoic geology
4. Cordilleran mobile belt
  - a. Accreted terranes onto craton, how to determine where craton edge is
  - b. Sonoman and Nevadan orogeny
    - i. Evidence of, Sierra Nevada and Idaho batholiths
    - ii. how to migrate igneous rocks eastward through time
  - c. Sevier orogeny
  - d. Interpretation of sedimentary rocks out west

## Mesozoic Life

1. invertebrates and plants
  - a. phylum mollusks: classes of gastropods, bivalves (rudists), cephalopods (ammonoids and nautiloids)
  - b. bony and lobe finned fish still around
  - c. seedless vascular and flowerless seed plants (cycads) dominate
  - d. flowering plants appear
    - i. how flowering and nonflowering plants reproduce
    - ii. advantages of being a flowering plant
2. vertebrates
  - a. appearance of archosaurs
    - i. what these include
    - ii. what they have in common
    - iii. difference between dinosaurs and other reptiles
  - b. two orders of dinosaurs (differences between the two)
    - i. saurischia
      1. theropods and sauropods
      2. examples of them, basic characteristics
    - ii. ornithischia
      1. duck-billed (ornithomimids), ceratopsia, stegosaurus, ankylosaur
    - iii. marine reptiles
      1. example of
    - iv. flying reptiles
      1. example of
  - c. lineage of birds
    - i. three theories for their origin
  - d. mammals
    - i. appear in Triassic from therapsids
    - ii. monotremes: characteristics and examples
    - iii. marsupials and placentals: characteristics, differences, examples
  - e. warm blooded nature of dinosaurs
    - i. examples of how to prove or disprove this theory

3. Extinctions
  - a. Triassic
    - i. Possible causes
  - b. Cretaceous
    - i. Possible causes
    - ii. Evidence of impact
    - iii. Why it may not be an impact as sole cause

### **Cenozoic geology**

1. Pangea breakup continues
2. Alpine-Himalayan orogenic belt
  - a. Formation and erosion of Himalaya
4. Laramide orogeny
  - a. Characteristics, differences from previous orogenies, what formed now
5. Basin and Range
  - a. How it forms
6. Igneous rocks of western U.S.
  - a. Yellowstone, Columbia River basalts
    - i. Model for where magma coming from, eruption characteristics
  - b. Cascade range
    - i. model for how these form
7. San Andrea fault
  - a. How formed
8. Erosion of Laramide uplifts
  - a. location, characteristics,
9. Quaternary geology
  - a. Names of 4 advances of glaciers
  - b. What glaciers are, types of them, what happens when they erode and deposit
  - c. Causes of ice ages and attempt to find evidence

### **Cenozoic life**

1. invertebrates
  - a. corals, nautiloids, cephalopods w/out shells
2. vertebrates
  - a. birds
    - i. flightless birds (diatryma)
    - ii. song birds appear
  - b. age of mammals
    - i. prototheria and theria (differences among theria)
    - ii. marine mammals
      1. changes necessary for the return to the sea
      2. ancestry
    - iii. Quaternary megafauna
      - Examples of, why so big,
      - Good places to find Quaternary fossils
    - iv. Extinction event
      1. what is gone, theories for extinctions