Historical Geology
Learning Objectives and Study Questions for Chapter 16

1. Cite two groups of marine organisms (either single- or multicellular) that a geologist could use to distinguish Mesozoic strata from Paleozoic and earlier ones.

2. Describe three features that a geologist might look for in the fossil record to help determine if a particular dinosaur was likely to have been an endotherm ("warm blooded") or an ectotherm ("cold blooded").

3. Draw a simple cladogram that traces the transition from early reptiles to the mammals. Be sure that it includes the major reptile groups (fin-backed reptiles, therapsids, etc.) as well as key adaptations in the lineage (development of amniote egg, secondary palate, etc.).

4. Describe the common types of rocks and structures found in Triassic fault-bounded basins of eastern North America, and explain the tectonic significance of these basins.

5. Sketch a cross-section of the western margin of North America at the latitude of California during Middle Mesozoic time, label the major environments in which rock units were being formed (forearc basin, volcanic arc, etc.), and indicate the names of the rock units that record those environments in California.

1. Mesozoic marine reptiles included the “dolphin-like” __________.
   A. nothosaurs
   B. plesiosaurs
   C. ichthyosaurs
   D. placodonts
   E. placoderms

2. Dinosaurs likely dominated mammals during Mesozoic time because they ____.
   A. were more aggressive
   B. reproduced via amniote eggs
   C. evolved slightly earlier
   D. were exclusively ectotherms
   E. were better educated

3. Birds evolved from which of the following dinosaur groups? Be as specific as you can.
   A. sauropods
   B. ceratopsians
   C. stegosaurians
   D. theropods
   E. ornithopods

4. The Triassic breakup of Pangaea in what is now the northeastern US is marked by __________ filled with __________.
   A. rift basins; melange
   B. subduction zones; redbeds
   C. rift basins; Louann Salt
   D. subduction zones; basalt lavas
   E. rift basins; redbeds
5. In California, the remnants of the Mesozoic forearc basin is preserved in the _____.
   A. Coast Ranges
   B. Cascades
   C. Central Valley
   D. Mojave Desert
   E. Sierra Nevada

6. The accretionary wedge of California's Mesozoic subduction zone is preserved today in the
   Coast Ranges as the _____.
   A. Sierra Nevada batholith
   B. Great Valley sequence
   C. Morrison Formation
   D. Sundance Sandstone
   E. Franciscan Formation

7. To the east of California in Jurassic time lay a foreland basin that was below sea level and
   held the _____.
   A. Saskatchewan Seaway
   B. Caribbean Sea
   C. Atlantic Ocean
   D. Sundance Sea
   E. Pacific Ocean

8. During late Jurassic time much of the Sundance Sea was filled by delta and river deposits of
   the _____. that contain abundant dinosaur fossils.
   A. Great Valley sequence
   B. Franciscan Formation
   C. Morrison Formation
   D. Old Red Sandstone
   E. Catskill Clastic wedge