

GEOL 01 – Physical Geology

Mid Term III Study Guide

Sedimentary Rocks and Depositional Environments

What are the three types of sedimentary rocks? Name some examples of each of these three types of sedimentary rocks. How might the sedimentary rock tell us about the environment it was deposited in? What is particle size? How does this control the type of sedimentary rock? What is sorting? What is rounding (vs. angularity) and what controls rounding (sphericity)? What is bedding? What is cross bedding?

What is the difference between laminar and turbulent flow?

What is the process of lithification? How are concretions formed?

What are processes that lead to rounding? Sorting? Describe sorting. What are roundness, sphericity, and mineralogy indicators of? Why?

Define: grains, porosity, cement, and matrix. What is the difference between quartz, arkose, and greywacke sandstones?

What is the main concept that the Hjulström diagram shows? What are the horizontal and vertical axes? How do these parameters control erosion or deposition?

What is the main difference between ripples and dunes? What is the difference between dunes or ripples formed by flow versus those formed by waves? Why?

What are the 3 main categories of depositional environment? Do you know the difference between bedload and suspended flow transport? What is the difference between traction and saltation?

Describe the difference between meandering and braided rivers. What is the main cause for the difference between these river systems? In meandering rivers, what side of the river gets eroded and what side is a place where sediment is deposited? How does the water depth control the velocity of water flow in a river? What is imbrication and what causes it? If you saw imbricated sediments, could you tell which direction the water flowed?

Do you know what the following are: continental shelf, continental slope, continental rise, and abyssal plain?

What are the two types of shores and what are some processes required for their development? How does a marine terrace form? What is an abrasion platform? What is a barrier island or sand spit?

What is a turbidity current? What is a turbidite?

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What are the 4 different types of deltas? Can you identify the features unique to each of them (this can help you tell which is which. Hint: look at the orientation of the sedimentary deposits)?

What is the difference between a transgression and a regression? What is the stratigraphic evidence for each of these (which is upward fining, upward coarsening, and why)? Can you prepare a drawing that shows where sediments of different grain size are deposited on the shelf (we looked at several examples)?

How does coal form?

Metamorphism and Metamorphic Rocks

What is the most important agent that drives metamorphism? What are some other factors that control metamorphism? What is confining pressure? What is differential stress? What is compressional stress?

What is foliation? What are some ways foliation can form? What is the difference between foliated and non-foliated? Name some foliated rock types. Name some non-foliated rock types.

What is a protolith? What is neocrystallization? What is pressure solution? What is plastic deformation?

What is metamorphic grade? Why does grade represent the maximum temperature or pressure the rock was exposed to? What are index minerals?

Describe how contact, hydrothermal, regional, and dynamic metamorphism works.

What are metamorphic facies? Give some examples of different types of facies. What tectonic environments lead to metamorphic rocks?

Geologic Time

What are the two types of geologic time based upon? Could you use an illustration like we saw in class to determine the relative age of different geologic units?

Time Type 1: What is the principle of superposition and what can this tell us about relative time? What is an unconformity and how are the different kinds of unconformities formed? What are cross cutting relations and what can they tell us about relative time? What are inclusions and what can they tell us about relative time?

Time Type 2: What are isotopes, ions, and atoms? How do the major subatomic particles help define these objects? How does ^{14}C age control work?