

## **Pre-Lab Reading Questions ES202**

The Pre-Lab Reading Questions are designed to encourage students to read lab material prior to attending class during any given week. Reading the weekly lab prior to attending class will result in better grade performance and permit the class to run more efficiently, maximizing benefits to all participants.

The Pre-Lab Reading Questions are to be completed by the student prior to each week's lab session. Questions will be reviewed by the instructor during the lab period, and checked for completeness. The Instructor will return the reading questions to students during the lab period, and the work will be formally included as part of the Lab Portfolio.

Students may use their lab manual (AGI), class notes, internet resources, and text book to answer the Pre-Lab questions. Answer all questions completely, use sketches and diagrams where appropriate.



## Lab 2: Review of Minerals, Rocks, and Tectonics

2-1. Distinguish the difference between a rock and mineral (define each, and briefly discuss the difference).

2-2. Define the following mineral property terms:

A. Translucent

B. Streak

C. Luster

D. Fracture

E. Cleavage

F. Hardness

G. Specific Gravity

2-3. Summarize the distinguishing physical properties of the following minerals

A. Quartz

B. Calcite

C. Halite

D. Potassium Feldspar

E. Plagioclase Feldspar

F. Clay

G. Muscovite

2-4. List the three main classes of rocks and discuss the general processes which form them.

2-5. Draw a diagram of the rock cycle, and label all components.

2-6. What is lithification?

A. List and discuss two processes of lithification.

2-7. Sketch and label Bowen's Reaction Series (by the way, what is Bowen's Reaction Series?)

2-8. Define the following plate tectonic terms, USE DIAGRAMS / DRAWINGS to illustrate your answers.

A. Lithospheric plate

B. Asthenosphere

C. Divergent Plate Boundary (spreading center)

D. Convergent Plate Boundary (subduction zone)

E. Transform Plate Boundary

2-9. What types of plate boundaries are associated with earth quakes?

2-10. What types of plate boundaries are associated with volcanism?



### Lab 3: Sedimentary Rocks

3-1. Briefly define the following sedimentary rock terms.

A. Sediment

B. Chemical Weathering

C. Physical Weathering

D. Sorting

E. Detrital

F. Texture

3-2. Discuss (specifically) the two different uses of the term clay.

3-3. What is the difference between conglomerate and breccia?

3-4. Devise a table with the grain-size (diameter in mm) classification for gravel, sand, silt, and clay.

3-5. Determine the types of rocks that will be formed from lithification of the following unconsolidated (loose) sediment:

**Unconsolidated Sediment**

**Resulting Rock**

calcite mud on a tidal flat

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beach sand

\_\_\_\_\_

angular gravel at the base of a mountain

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evaporation of the Great Salt Lake

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detrital mud in a lake

\_\_\_\_\_

shell material in shallow ocean off the Bahama Islands.

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## Lab 4: Intro to Sedimentology and Stratigraphy

4-1. Define the following terms (**use diagrams / drawings to illustrate your answers**).

A. stratification

B. beds

C. laminations

D. cross-bedding

E. graded-bedding

4-2. Briefly discuss three types of sedimentary environments that are found at the earth's surface. **Use sketches and diagrams to illustrate their mode of occurrence.**

4-3. What are flute casts?

4-4. In what type of sedimentary environment would mudcracks form?

4-5. What is an unconformity?

- 4-6. Diagrammatically illustrate (in chronological order) the Eras and Periods of the geologic time scale. In addition, include the Epochs of the Cenozoic Era.

## Lab 5: Topographic Maps and Aerial Photographs

5-1. Define the following map-related terms:

A. Longitude

B. Latitude

C. Topographic map

D. Fractional Scale

E. Contour Interval

F. Index Contour

G. Gradient

5-2. Discuss the difference between a "quadrant bearing" and an "azimuth bearing". **Give examples of each.**

5-3. What is the difference between a topographic map and a topographic profile?

5-4. What is the significance of aerial photographs? (how are they obtained, how may they be used?)



## Lab 6: Fluvial Systems and Landforms

6-1. Define the following river-related terms (**Use diagrams / sketches**):

A. Perennial stream

B. Flood

C. Alluvial Fan

D. Dendritic Drainage Pattern

E. Drainage Divide

F. Stream Terraces

G. Delta

6-2. What is the difference between a meandering and braided river system (**include a drawing of each**).?

6-3. What is the difference between "bank full stage" and "flood stage"?

6-4. Distinguish between a cut bank and point bar (**use a drawing with labels and definitions**).



## Lab 7: Groundwater

7-1. Define the following groundwater terms (**use sketches as much as possible**).

A. Porosity

B. Permeability

C. Aquifer

D. Confining Layer

E. Karst

F. Recharge

G. Sinkhole

7-2. Discuss the processes that occur when water, carbon dioxide, and limestone bedrock get together.

7-3. List and discuss four pieces of evidence that suggest an area is subject to karst processes.



## Lab 8: Glacial Systems / Climate Change

8-1. Define the following glacial terms (**use sketches to help demonstrate your answers**).

A. Glacier

B. Till

C. Drift

D. Zone of Ablation

E. Cirque

F. Kame

G. Drumlin

H. Loess

I. Tarn

J. Erratic

8-2. List four depositional features associated with alpine and continental glaciers.

Alpine

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Continental

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8-3. List four erosional features associated with alpine and continental glaciers.

Alpine

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Continental

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8-4. What is the difference between a terminal moraine and recessional moraine?

## Lab 9: Desert Processes and Landforms

9-1. Define the following desert landform terms (**Use Sketches and Diagrams, where possible**).

A. Desert

B. Eolian

C. Sand Dune

D. Ventifact

E. Arroyo

F. Bajada

G. Playa

9-2. Discuss the difference between a butte and a mesa (**draw diagrams to support your answer**).

9-3. What is the significance of the Sand Hills of Nebraska?



**Lab 10: Coastal Processes and Landforms**

10-1. Define the following coastal terms (**use sketches where appropriate**).

A. Coastal Erosion

B. Estuary

C. Tidal Flat

D. Barrier Island

E. Sea Stack

F. Storm Surge

10-2. List three landform features that are evidence for a submergent and emergent coastline:

Submergent Coast

Emergent Coast

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10-3. Discuss some of the ramifications for coastal areas as related to "global warming".

