NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_LAB MEETING DAY/TIME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Lab 3, Identifying Sedimentary Rocks

For the first part of Lab 3, you will be identifying a set of sedimentary rocks. These are placed around the lab room, and you need to identify 10 rocks. You will use a **sedimentary rock identification** handout and the table below to record your observations. You should use Exercise 3 in your lab manual for reference.

# **Sedimentary Rock Samples**

You are provided samples of 10 sedimentary rocks – **ADVISE STUDENTS TO CHOOSE ANY 10 SAMPLES TO IDENTIFY**. Examine each sample carefully, recording at least 4 characteristics (composition, texture, other identifying features) for each. Name each rock using the identification chart handout provided. (Note that we are not using the rock data sheets provided in the Lab Manual, but you may use them as a reference tool.)

|  |  |  |
| --- | --- | --- |
| **#** | **Description** | **Rock Name** |
| ~~1~~ TELL STUDENTS TOWRITE SAMPLE LETTER HERE | COMPOSITION: **Should write something to indicate composition (dark grains, fossils, sand, mud, etc)**  TEXTURE: **size, shape of grains, include rounding and sorting where visible**  OTHER IDENTIFYING FEATURES: **colors, fossils, crystals, how it breaks, etc.** | **Name using the classification chart (words in parentheses below are optional, but encourage students to narrow down to these.** |

|  |  |  |  |
| --- | --- | --- | --- |
| **A** | ***limestone (micrite)*** | **J** | ***(fossiliferous) limestone*** |
| **B** | ***chert*** | **K** | ***(oolitic) limestone*** |
| **C** | ***(quartz) sandstone*** | **L** | ***(quartz or arkose) sandstone*** |
| **D** | ***Limestone (with calcite geode)*** | **M** | ***Mudstone or siltstone*** |
| **E** | ***(lithic or graywacke) sandstone*** | **N** | ***Breccia*** |
| **F** | ***(arkose or muddy) sandstone*** | **O** | ***(fossiliferous) limestone*** |
| **G** | ***(anthracite or bituminous) coal*** | **P** | ***(arkose (sandstone)*** |
| **H** | ***Shale*** | **Q** | ***(quartz or arkose) sandstone*** |
| **I** | ***conglomerate*** |  |  |

# Go on to the next page of this worksheet to continue Lab 3

Lab 3, sedimentary Environments

For the second part of Lab 3, you will be completing Exercise 4 in your lab manual. In this exercise, you will apply your understanding of sedimentary rock types and characteristics to practice interpreting past sedimentary environments. **USE EXERCISE 4 IN YOUR LAB MANUAL TO KNOW WHAT TO RECORD HERE…WRITE YOUR ANSWERS BELOW.** If you haven’t read the introductory material for Exercise 4, do that now, before answering questions.

# **Exercise 4, PART A**

*For this and the following exercises, carefully review the images and text associated with each figure. Use Table 4.1 in the manual to help with your answers.*

**1.**

***Conglomerate***

**2.**

***Oxidation, non-marine environment***

**3.**

***Alluvial fan environment based upon poor sorting including large clasts, oxidized iron, and thick bedding.***

# **Exercise 4, PART B**

**1.**

***Sandstone***

**2.**

***Coal***

**3.**

***Delta and barrier island; based upon predominance of sandstone and presence of coal.***

# **Exercise 4, PART C**

**1.**

***Sandstone and shale***

**2.**

***Elongated, thin***

**3.**

***Fluvial (stream or river)***

**4.**

***Shales at locality (1) are floodplain deposits. Dinosaurs found here were trapped by floods and buried whole with little or no transport. Dinosaurs in stream channels (2) would become disarticulated and broken during stream transport.***

# **Exercise 4, PART D**

**1.**

***Shale with siltstone layers (laminae)***

**2.**

***Deposition in anoxic water.***

**3.**

***Deep marine due to anoxic water, minimal burrowing and disruption of bedding, presence of only ammonoids (swimming organisms) and trace fossils. Fine-grained nature of the sediment.***

# **Exercise 4, PART E**

**1.**

***Thin and laterally continuous across the outcrop.***

**2.**

***The area was intermittently wet and dry.***

**3.**

***Sediment was transported in two opposite directions as shown by figure 4.11 B and D. Ripple marks are symmetrical, indicating oscillatory flow.***

**4.**

***The water was shallow enough for a four-legged reptile to touch bottom as it swam.***

**5.**

***Tidal flat as indicated by bidirectional flow, intermittent wetting and drying, ability of animals to occupy the area at times, lateral continuity of thin beds, and reddish color.***

# **Exercise 4, PART F**

**1.**

***These features indicate that deposition occurred in a shallow, high-energy environment. High energy is indicated by the cross bedding, absence of mud, good sorting, and presence of ooids. Modern ooids form in shallow water where tidal and wave energy can waft them into the water column after a period of shallow burial, at which time a new layer of aragonite is added to the ooid. The presence of crinoids indicates deposition in a marine environment rather than lake or river.***

# **Lab 3 Reflection**

**In what way were you able to connect ideas of sedimentary rocks and sedimentary environments in this lab? Or, what was a way this lab helped connect ideas from your lecture / readings?**

***Any answer OK here, but should show some evidence of reflection on the lab topics.***

**What was an “ah-ha” moment you had during this lab? This is a time when something suddenly made more sense with additional knowledge.**

***Any answer OK here, but should show some evidence of reflection on the lab topics.***