

LAB 8: FOSSILS OF THE MESOZOIC

Note: For this lab, sample images are available in the online Lab Manual. This worksheet is intended to help you organize your answers only. Refer to the Lab Manual for important additional details and context to answer the questions. This worksheet includes sample handling guidelines for in-person labs.

KINGDOM PROTISTA

- a. List the members of Kingdom Protista who are:
 - i. Primary producers:

 - ii. Primary consumers:

- b. Which term describes the metabolism of primary producers: heterotrophic, chemotrophic, or autotrophic? Write a short definition of the term you selected.

- c. What is the name of the biochemical mechanism that primary producers use to capture and convert sunlight energy?

- d. Which term describes the metabolism of primary consumers: heterotrophic, chemotrophic, or autotrophic? Write a short definition of the term you selected.

- e. What were the likely reasons for the evolution of an organic outer covering for early phytoplankton in the Precambrian?

- f. What is the life habit of a dinoflagellate?

- g. What environment range(s) do dinoflagellates inhabit: photic, bathyal, or abyssal?

- h. What is the life habit of a foraminifera?

- i. What is the primary difference between coccoliths and diatoms?

PHYLUM MOLLUSC, CLASS CEPHALOPODA

A. Sample 37: Modern Coiled Nautiloid- This sample can be picked up but please treat it with care.

- a. Why did the animal keep adding chambers to its shell (that is, what was the biological purpose of the chambers)?

- b. Notice the holes that pass from the outer chamber into the inner chambers. What was this for?

B. Sample 39: Uncoiled Nautiloid- This sample can be picked up but please treat it with care.

- c. What structural (as opposed to biological) function do the chamber walls provide?

C. Sample 121-34: Ammonoids- These samples can be picked up but please treat them with care.

- d. Based on the suture pattern, what kind of ammonoid was this?

D. Sample 121-53: Ammonite- This sample can be picked up but please treat it with care.

- e. Look at the end of the segments and the shape of the chamber walls. What structural purpose does this complex suture shape serve?
- f. Compare Sample 121-53 with samples FFC-24 and 6B below. Generalize from your observations and draw an example ammonite that you can use as a study guide. Label the key features of your drawing.

E. Sample FFC-24: Ammonite - This sample can be picked up but please treat it with care.

No questions for marks.

F. Sample 6B: Ammonites- These samples can be picked up but please treat them with care.

No questions for marks.

G. Sample NB3: *Baculites* Ammonite - This sample can be picked up but please treat it with care.

- g. Coiling is a common characteristic of ammonoids. What characteristic of Sample NB3 tells us that it is not only an ammonoid, but also an ammonite in spite of it not being coiled?

PHYLUM ECHINODERMATA**A. Sample 10: Crinoid Stems - These samples may be picked up but please treat them with care.**

- a. What symmetry is exhibited when stem segments of Sample 10 are viewed in cross-section?

B. Sample FGC3: Crinoid Stems - Please do not touch these specimens

- b. How does the symmetry of Sample FGC3 differ from that of Sample 10?

C. Sample GC5: Crinoid Stems in Calcite - This sample may be picked up but please treat it with care.

- c. What type of preservation do we see in the crinoid stems throughout this sample?
- d. Going back to what you learned in Lab 1, what is the name of this carbonate rock?
- e. Judging from the fractured stems what could you say about the energy of the sedimentary environment that this rock was created in?

D. Sample L8: Crinoid Stems- This sample may be picked up but please treat it with care.**E. Sample FFC4: Crinoid Stems- This sample may be picked up but please treat it with care.**

- f. Which sample—L8 or FFC4—may have lived in a higher energy environment? What feature of the stems led you to this conclusion?

F. Sample 121-45: Articulated Crinoid- This sample may be picked up but please treat it with care.

- g. Describe the life habit of the organism preserved in sample 121-45. What type of environment would this crinoid be found in?

G. Sample L8A: Intact Crinoids- PLEASE DO NOT TOUCH. This sample is very fragile.

- h. Notice the feathery structures located at the end of each crinoid arm. What were they used for?

H. Samples 8 & GD1: Blastoid Calyx- These samples can be picked up but please treat them with care.

- i. What life habit of blastoids is different from the echinoids?

I. Sample 121-39: Blastoids- PLEASE DO NOT TOUCH. This sample is very fragile.

- j. Two structures are highlighted in the last slide. What part of the blastoid are they? Explain your reasoning.

J. Sample 16: Sand Dollars- These samples can be picked up but please treat them with care.

- k. Sketch fossil Sample 16 from the top, and mark on it the five lines that separate the five “wedges” of the pentamerous symmetry.

- l. Next, on the drawing above, identify the line about which the animal actually forms a mirror image from side to side (the line of bilateral symmetry).

- m. Describe the life habit of this animal (see Lab 7).

K. Sample 121-37: Heart Urchin- This sample may be picked up but please treat it with care.

- n. Compare Sample 121-37 with Sample 16. What key characteristic could you use to tell a sand dollar from a heart urchin?

L. Sample 121-47: Sea Urchin- These samples can be picked up but please treat them with care.

- o. What characteristic of this animal's habit makes it more susceptible to predation than the previous sample (heart urchin)?