# BIOLOGY 183 MARINE BIOLOGY
# PIMA COMMUNITY COLLEGE, DOWNTOWN CAMPUS

## WORKSHEETS FOR UNIT 10

### UNIT 10 LEARNING OBJECTIVES

See the Bio 183 Unit 10 website for the Learning Objectives.

### UNIT 10 ACTIVITIES

**Step 1:** Read Chapter 10 in your textbook (*Marine Biology*, 7th ed., by Castro and Huber) and answer the questions in these worksheets. For hints or to double-check your answers, go to the Biology 183 website.

**Step 2**: For lab points, do the lab activity entitled "Ecobeaker: Barnacles." There are worksheets for this activity later in this packet. Directions are on the Biology 183 website. This lab must be completed at the Biology Learning Center. When you have completed the lab activity, take your results to the front desk in the Biology Learning Center to receive lab points.

**Step 3**: Do the optional activity entitled "Ecology of Marine Organisms." There are worksheets for this activity in the lab packet. Directions and answers are on the Biology 183 website. This lab can be completed at home and does NOT require internet access. This material will be on your Unit 10 exam.

**Step 4**: Prepare for the Unit 10 exam. The exam will consist of 40 multiple-choice questions. Thirty-seven questions will be "factual" in nature (to assess whether you learned the facts in this unit). Some of these 37 questions may come from material you learned during your lab activities. To prepare for the 37 "factual" questions, try the multiple-choice practice quiz for Unit 10. Go to the Biology 183 website for the link to this practice quiz. The answers are at the end of the practice quiz.

The remaining 3 questions will assess your deeper understanding of the themes and concepts of the material in this unit (to assess whether you have "synthesized" the information, not just memorized the facts). The critical thinking questions at the end of your worksheets will help you study for the remaining 3 questions.

**Step 5**: Come in to the Biology Learning Center to take your Unit 10 exam. The exam will consist of 40 multiple-choice questions.

## STEP 1: TEXTBOOK WORKSHEETS

**1. Review: What is a habitat? (p. 19)**

**2. What are two important influences on how many and what kinds of organisms live in any particular place?**

**3. What is ecology?**

***The Organization of Communities***

**4. What does the term "abiotic" mean?**

**5. What does the term "biotic" mean?**

**6. Review: What is a population? A community? (p. 71)**

**7. What are physiological adaptations?**

**8. Review: What is natural selection? (p. 79)**

**9. What is evolutionary adaptation?**

***The Organization of Communities: How Populations Grow***

**10. What are two abiotic factors that may limit how populations grow over time?**

**11. What are four biotic factors that may limit how populations grow over time?**

**12. What are resources?**

**13. Review: What are nutrients? (p. 68)**

**14. What is the carrying capacity?**

**15. What is a limiting resource?**

**16. What is competition?**

**17. Compare intraspecific and interspecific competition.**

***The Organization of Communities: Ways That Species Interact***

**18. What is biodiversity? What is the current status of biodiversity on earth? [See the boxed section: Biodiversity: All Creatures Great and Small]**

**19. What are three general ways that species interact?**

**20. What is competitive exclusion?**

**21. What are some factors that may impede competitive exclusion?**

**22. What is resource partitioning?**

**23. What is an ecological niche?**

**24. What is predation?**

**25. What is the difference between carnivores and herbivores? Are they both predators?**

**26. What is the relationship between predation and the prey population?**

**27. What are indirect interactions? Give an example.**

**28. What are three predation strategies?**

**29. What are three strategies for avoiding predation?**

**30. What are inducible defenses? Give an example.**

**31. What is coevolution? Give an example.**

**32. What is symbiosis?**

**33. What are the three types of symbiosis?**

**34. Describe commensalism and give an example.**

**35. Describe parasitism and give an example.**

**36. Describe mutualism and give an example.**

**37. Review: What are zooxanthellae? (p. 96)**

**38. Describe cleaning associations. What type of symbiosis do they represent?**

**39. Define and compare facultative and obligate symbioses.**

**40. What are some factors that affect the larval ecology of marine organisms?**

*Major Marine Lifestyles and Environments*

**41. What is ecological zonation?**

**42. What are benthic organisms? (Fig. 10.11)**

**43. What are sessile benthic organisms? (Fig. 10.11)**

**44. What are pelagic organisms? (Fig. 10.11)**

**45. What are phytoplankton and zooplankton? How are they different from the nekton? (Fig. 10.11)**

**46. Describe the zonation in the benthic ocean by depth. (Fig. 10.12)**

**47. Describe horizontal zonation in the pelagic ocean. (Fig. 10.12)**

**48. Describe the vertical zonation in the pelagic ocean by depth. (Fig. 10.12)**

***The Flow of Energy and Materials***

**49. Generally describe the flow of energy and materials in an ecosystem.**

**50. Review: What are autotrophs? What are heterotrophs? What is primary production? (p. 67-68)**

***The Flow of Energy and Materials: Trophic Structure***

**51. What are trophic relationships?**

**52. What is a food chain? How is it involved in the flow of energy and materials in an ecosystem? What is a trophic level? (Fig. 10.13)**

**53. What is a food web? (Fig. 10.14)**

**54. What are primary, secondary, and tertiary consumers? (Fig. 10.15)**

**55. Describe how the flow of energy in an ecosystem can be modeled using a pyramid of energy. (Fig. 10.16)**

**56. What is the relationship of the pyramid of energy to the pyramid of numbers of organisms in an ecosystem?**

**57. What is the relationship of the pyramid of energy to the pyramid of biomass in an ecosystem? (Fig. 10.16)**

**58. What are decomposers? How do they recycle materials in an ecosystem?**

**59. What is dissolved organic matter (DOM)? What is detritus?**

**60. How is primary production measured?**

**61. What is the gross primary production?**

**62. What is the net primary production?**

**63. What areas of the pelagic ocean have the highest productivity? (Table 10.1)**

**64. What areas of the pelagic ocean have the lowest productivity? (Table 10.1)**

**65. What areas of the benthic ocean have the highest productivity? (Table 10.1)**

**66. What areas of the benthic ocean have the lowest productivity? (Table 10.1)**

**67. Review: What does "pelagic" mean? What does "benthic" mean? (p. 220)**

**68. Overall, which has higher productivity, the benthic or pelagic ocean? Table 10.1)**

**69. What is the standing stock?**

**70. How is standing stock determined?**

***The Flow of Energy and Materials: Cycles of Essential Nutrients***

**71. What is the ultimate fate of energy in an ecosystem?**

**72. What is the ultimate fate of materials in an ecosystem?**

**73. What are three chemical cycles that are important in ecosystems?**

**74. Briefly describe the carbon cycle. (Fig. 10.20)**

**75. Briefly describe the role of nitrogen fixation in the nitrogen cycle. (Fig. 10.21)**

**76. Briefly describe the phosphorous cycle. (Fig. 10.22)**

**Critical Thinking Questions**

**77. Two species of sea urchins live practically side by side on sandy bottoms. They appear to have the same diet: drifting sea weeds and other bits of organic matter. They are able to live in the same environment without competing with each other. How might they be able to share their habitat and food resources?**

**78. It is not always easy to categorize a particular case of symbiosis. Suppose a certain species of snail is always found living on a certain coral. No one has found evidence that the snail harms the coral, so the relationship is classified as an example of commensalism. How would you go about testing this hypothesis? What kinds of observations might lead to the conclusion that the snail is a parasite, or that it has a mutualistic relationship with the coral?**