

PHYS 122: Life in the Universe
Class Session 10, February 10, 2011

LEARNING OBJECTIVES

- 1) Describe the difference between autotrophs and heterotrophs. Explain the distinction between the chemo- and photo- classifications. Provide what kind of 'troph' we humans are.
- 2) Explain how gene mutation occurs, and how it provides the basis for the evolution of species. Give an example of a beneficial mutation.
- 3) Describe 3 extreme conditions where microorganisms are found to thrive and give the organism's names. Explain the implications for finding extremophiles in searching for life elsewhere in the universe.

Required Textbook readings for class 10: p. 167-171, 176-181 (5.3, end of 5.4, 5.5)

1. What two basic things do ALL cells need to function? How do ALL cells store and release energy?
2. Name and describe the two kinds of ways organisms 'feed' themselves.
3. Name and describe what the two types of energy sources are for organisms.
4. What is the role of RNA? How often does a replication error occur? What does this lead to if the cell survives?
5. What are black smokers, where are they found and what makes them? How can water be liquid (not boiled away) at 660 °F?
6. What is a thermophile? Psychrophile? Endolith? What is the use of an endospore? How might we infect other planets with life from earth?
7. What does the study of extremophiles have to do with searching for life elsewhere?