Biology 3 Exam 1 Study Guide

The exam will consist of true/false, multiple choice, matching, short answer and long answer questions. Topics for short answer questions are **emboldened**, whereas the topics for long answer questions are **emboldened and underlined**. Key words are new vocabulary that was introduced within the lecture and will be incorporated into the exam questions.

**Intro to Biology, Ecology, and the Scientific Method**

Know the following: Know the difference characteristics that define living things. **Be able to describe the steps of the scientific method including the different types of data.** Does an investigator have to finish all the steps of the scientific method before starting over? What is a variable? What is the difference between biotic and abiotic variables? What makes a good hypothesis? Know the difference between and independent and dependent variable. What axis are the different variables located on? Know how to interpret different graphs (bar, line, scatter plot). What is the difference between a scientific theory and a non-scientific theory. What is the chief unifying principle in all fields of biology. Know the definition for ecology and the different levels of study (individual, population, community, ecosystem)

Key words: Variable, independent variable, dependent variable, falsifiable, histogram, scatter plot, linear regression, scientific theory, scientific law, ecology, population, community, ecosystem

**Factors that Shape Ecosystems on Earth**

Know the following: Know the different layers of the earth including the layers that make up the asthenosphere and lithosphere. Know the differences between oceanic and continental crust concerning age and density. Know the difference between mid-ocean ridges, transform faults and trenches. What is Pangea. What continents made up Laurasia? Gondwana? Know the different forms of evidence in support of the theory of plate tectonics. Know the different types of plate boundaries. **Describe how sea-floor spreading leads to the formation and expansion of oceans. Include the types of crust involved, the characteristics of each crust, and the role of each crust at the different plate boundaries.** Where do subduction zones occur? What type of plate boundary is the San Andreas Fault? Know the difference between active and passive margins? Know the difference between the transverse and peninsular ranges (which way they run) and the mountains that make up each range. Know the different factors (biotic and abiotic) that make up an ecosystem. Know the factors that cause the ecosystems on earth. What causes seasonality on earth? **Describe the intertropical convergence zone and how it relates to Hadley cells.** What is the Coriolis effect and how does it drive the wind patterns on earth? Know the different major wind systems on earth and the direction they blow. Why are most deserts located at 30 degrees north and south latitude? What is a gyre? Be able to explain the rain shadow effect. Know the difference between climate, microclimate, and weather. What type of climate do we have in southern California. Know the different biomes and the characteristics of the different biomes (annual trends in precipitation and temperature). What biomes do we have in California? Know how the different Ecosystem classifications are defined, including biomes, California plant communities, Merriam’s life zones, and ecoregions. What is biotic zonation? Know the different southern California plant communities and how they differ. Know the adaptations that southern California plants have evolved to deal with fire. **Be able to describe why the vegetation on north and south facing slopes differ and describe how the vegetation differs.** What types of trees are affected by the bark beetle?

Key words: Core, mantle, crust, asthenosphere, lithosphere, oceanic crust, continental crust, mid-ocean ridge, transform fault, trench, Pangea, Laurasia, Gondwana, divergent boundary, convergent boundary, transform boundary, subduction zone,

**Physical and Chemical Properties of Ecosystems**

Know the following: What percentage of the earth is covered with saltwater? Freshwater? Know the different properties of water and the importance of each property in the function of living things (Ex: cohesion allows for water to be transported up the stems of plants). Which form of water is the densest? How is the changing density of water important to living things? Know the four elements that make up 96% of the human body. What is a biogeochemical cycle. **Be able to describe the biogeochemical cycles for water, carbon and nitrogen**. Why is soil important? What is does soil consist of? What is loam? Humus? Know the different marine and freshwater ecosystems. Where is marine biodiversity greatest? What determines the density of water? What is the thermocline? How do changes in water density drive downwelling in temperate and polar waters? **Be able to describe the process of coastal upwelling.** How do changes in water temperature drive nutrient turnover in freshwater lakes? What wavelength of light penetrates the deepest in clear water? Why are many deep-sea animals red in color? Know the difference between spring tides and neap tides and be able to interpret a tide chart. **Be able to explain how California grunion and corals use the tides to aid in their reproduction.** Know the different zones within the rocky intertidal and the different organisms found in each zone. Which zone has the greatest biodiversity? Where are most hard-shelled organisms found? Where are the most soft-bodied organisms found? Where is competition for space greatest? Know the different challenges faced by intertidal organisms. **Be able to define a keystone species and describe the role of sea stars in the rocky intertidal zone and how sea star wasting disease has affected intertidal biodiversity.** What is an estuary? Know the different habitats within an estuary. Which habitat has the highest concentration of species? **Be able to describe the concept of resource partitioning an be able to provide an example of resource partitioning.** What are halophytes? Know the difference between salt grass and pickleweed, and how each species has adapted to exposure to salt water. Know the different reasons why estuaries are important.

Key words: Cohesion, surface tension, solute, solvent, solution, specific heat, high heat of vaporization, evaporative cooling, hydrophilic, hydrophobic, biogeochemical cycle, loam, humus, intertidal zone, coastal zone, photic zone, pelagic zone, benthic zone, profundal zone, littoral zone, thermocline, spring tide, neap tide, zonation, splash zone, high-tide zone, mid-tide zone, low-tide zone, desiccation, estuary, resource partitioning, halophytes