STUDY GUIDE FOR TEST 1

YOU SHOULD BE ABLE TO RECALL, UNDERSTAND AND APPLY THE FOLLOWING:

What Science is, How it works via the scientific method (including statistical analysis, average and standard deviation)

What a scientific theory is

The characteristics of living things

The different definitions of evolution, including microevolution, speciation, and macroevolution

Compare the different mechanisms of microevolution: natural selection (sexual selection, disruptive, directional and stabilizing selection), mutation, gene flow, genetic drift (bottle neck effect and founder effect)

The Hardy-Weinberg principle and its applications

The different cases seen in class: sickle cell disease, Darwin finches, sea otters

The misconceptions about natural selection and evolution

The species concept and different types of speciation

The process of speciation (genetic isolation, genetic divergence, reproductive isolation, pre and post zygotic barriers)

How do scientists reconstruct evolutionary relationships into evolutionary trees, how to interpret an evolutionary tree or phylogeny

What evolutionary patters have been observed at the macro level (extinction, stasis, adaptive radiation, mass extinctions, convergent evolution)

The different classification of characters and whether they are useful or not for reconstruction of phylogenies (analogous characters, homologous characters, synapomorphies)

The different types of classification groups relative to their phylogenies (monophyletic, paraphyletic and polyphyletic clades)

How each of the following lines of evidence supports evolution: fossils, transitional forms, biogeography, dna and proteins, embryo development
The difference between ecology and environmentalism

The difference between population ecology, community ecology and ecosystem ecology

The difference between abiotic and biotic factors

The different types of population growth: logistic and exponential growth. Be able to interpret growth curves for each and the situations that lead to each type of growth. Apply this information to the human population

Factors that affect the growth of a population

How does carrying capacity, ecological footprint and sustainable development relate to the human population

The process of ecological succession and how does it relate to southern California

The community and interactions that exist in the community of the Arctic National Wildlife Refuge

The interspecific relationships that exist within a community and their effects on the species, (competition, competitive exclusion, resource partitioning, predation, adaptations for predation, symbiosis, commensalism, parasitism, mutualism)

How humans have taken advantage of these interspecific relationships

How humans have affected these interspecific relationships

How do cellular respiration and photosynthesis relate to the interactions within an ecosystem

How does energy and chemical elements move through the ecosystem

The ecosystem interactions and their implications on humans: food chain, food web, trophic structure, energy pyramid, biological magnification.

The movement of chemicals within an ecosystem, specifically carbon.

The current climate change and its effects on humans and other species