

Chapter 1 – State of our Earth

- Environment vs. Environmental science
- Neuse river issue
- Ecosystems: abiotic and biotic components
- Environmental scientist vs. environmentalist
- Sustainability/Sustainable living
- Effects of environmental changes – compare speciation with extinction & greenhouse gases
- Experimental design- variables, hypothesis, controlled experiment; theory, law, claim with evidence and reasoning, conclusions

Chapter 2 – Environmental Systems

- Mono Lake issue
- Elements (incl. radioactive isotopes C^{12} and C^{14})
- Bonds in compounds
- Polar nature of water, states of matter, temps and phase changes, density
- pH – acids and bases
- conservation of matter (mass)
- organic compounds – various macromolecules: carbs, lipids, nucleic acids, proteins
- Energy laws (Laws of thermodynamics) – conversions, efficiency
- Ecosystem function – energy flow, matter cycling, biotic/abiotic
- Feedback loops – positive/negative

Chapter 3 – Ecosystem Ecology

- Ecosystem structure: autotrophs (producers), heterotrophs (consumers & decomposers)
- Energy flow through food chain, web, pyramid (10% rule and heat loss)
- Photosynthesis & Respiration (formulas, products, reactants, how fit with carbon cycle, which organisms)
- Gross and Net Primary Productivity (how different, what affects)
- Carbon cycle – climate change, combustion deforestation, ocean acidification
- Nitrogen cycle – processes, organisms, compounds, impacts
- Phosphorus cycle – processes, no gas phase, limiting nutrient, algal blooms
- Ecosystem disturbances...intermediate disturbance hypothesis...resistance and resilience
- Watershed impacts
- Ecosystem values...ecosystem services

Chapter 4 – Global Climates and Biomes

- Weather vs. climate
- Structure of atmosphere...layers...temps...pressure...gases...various processes
- Unequal heating...influence of axis tilt on seasons/intensity of sunlight; influence of vertical air movement, winds, ocean currents, Coriolis effect
- Relationships between air pressure, expansion, temperature, moisture holding capacity
- Rain shadow...influence of topography on local climates/weather
- Biomes...general characteristics of biomes

Chapter 5 – Evolution of Biodiversity

- Definition of species, evolution, natural selection
- Extinction rates (factors)
- Species evenness vs. richness...(biodiversity)
- Types of diversity – genetic, species, ecosystems
- Phenotype vs. genotype
- Natural selection and artificial selection
- How natural selection works
- Random processes - bottleneck effect, mutation, founder effect, genetic drift
- How random and non-random processes still lead to evolution
- Speciation – reproductive isolation (geographic, behavioral, temporal)
- Niche – generalist vs. specialist
- Importance of population size, reproductive rates, genetic variation, niche
- Fundamental niche...realized niche...abiotic factors (tolerance limits)

Chapter 6 – Population and Community Ecology

- Levels of complexity: individual→population→community, etc.
- Population ecology – characteristics
- Carrying capacity – how its determined
- Population growth – birth rates, death rates, immigration, emigration, growth rate
- Density dependent vs. density independent factors
- Niche overlap and competition – competitive exclusion, resource partitioning
- Symbiosis – mutualism, parasitism, commensalism
- Predation and related tactics – mimicry, camouflage, other adaptations
- Keystone species
- Succession – primary vs. secondary, processes, changes, causes pioneer species, climax communities

Chapter 7 – The Human Population

- Fertility rate, TFR
- Factors that affect population growth
- Exponential vs. Logistic growth
- Characteristics of developing countries/developed countries...related to age structure diagrams and phases of growth
- Why has human population been growing rapidly over last several millennia?
- Factors affecting US population growth
- Rule of 70
- IPAT
- Thomas Malthus vs. Others with regard to population growth and food
- Relationship between child mortality, infant mortality, life expectancy, affluence (potable water, food, sanitation, health care)
- HIV infection/disease...global hot spots
- Human population and density dependent causes of death
- Demographic transition (Phase 1-4)
- Demographic transition and age structure diagrams related to population trends (increasing, decreasing, constant)

Chapter 8 – Earth systems

- Case study – Are Hybrid Vehicles as Env Friendly as We Think?
- Layers of Earth – identify and composition (lithosphere is crust and part of mantle)
- Surface changes constantly due to plate tectonics
- Theory of Plate Tectonics
- Plate movement → Event → Surface change
- Human impact
- Rock cycle – processes and rocks
- Weathering and Erosion
- Formation of Soil
- Soil Horizons and properties
- Tests on soil
- Soil Degradation
- Mining – types, effects

Chapter 9 – Water Resources

- Case Study – Dams and Salmon on the Kamath River
- Distribution of water resources
- Groundwater – functions, aquifers, recharge, wells, problems
- Surface water – functions, nutrient levels in water bodies, wetlands, floodplains, problems
- Atmospheric water – movement of water and energy around planet, problems
- Availability of water and human impact – levees, dikes, dams, aqueducts
- Desalination
- Water use – agriculture, industry, household
- Agriculture – irrigation, hydroponic, salinization
- Water ownership
- Water conservation

Ideas for studying:

- Strive for a Five workbook
- Review Test folder
- Review Powerpoints – pay attention to bold terms, questions, highlighted stats
- Make flashcards, choose 2 at random and see if you can make a connection
- Make flashcards and put case studies, events, etc. that relate
- Review all outlines
- Take your quizzes again
- Study released tests from college board for FRQs
- Make concept maps for each chapter
- Do EOC questions in textbook
- Review any graphic organizers we've made in class
- Understand the human impact for each chapter
- Practice the math that you are unsure or slow with
- Shmoop – see me if you can't get signed in