

Review for Final Exam – Suggestions All material covered in the course is testable. The following are suggested topics to cover, but is not meant to be an exhaustive list. Topics that are not listed but were covered in the course are testable. Please see the blog for a list of chapters in the text. Please study your notes, textbook, workbook, diagrams, etc. Make sure you understand the following:

Classification:

- Purpose/origin
- Classifying organisms – how is it done
- Evolutionary relationships, biochemical relationships, homologous structures, embryological relationships
- Eukaryotic/prokaryotic cells- compare and contrast characteristics
- General characteristics of Kingdoms Monera, Protista, Fungi, Plantae, Animalia
- Levels of Taxa – kingdom, phylum, class, etc
- Binomial nomenclature and scientific name

Evolution:

- DNA - structure
- Double helix
- Sugar phosphate backbone
- Nitrogenous bases (A,T,C,G)
- Complementary base pairing
- Role of DNA in evolution
- How evolutionary change occurs: mutation, genetic drift, gene flow, non-random mating, and natural selection
- Compare and contrast convergent evolution, divergent evolution, and speciation
- Compare and contrast gradual change model with the punctuated equilibrium model of evolution

Ecology:

- Describe ecological succession and how it relates to the following terms:
- Pioneer species
- Climax community
- Explain the role of producers in the ecosystem
- Explain the role of consumers in the ecosystem
- Explain the role of decomposers in the ecosystem
- Explain photosynthesis and cellular respiration as they relate to interactions within the ecosystem and in terms of the reactants and products involved
- Explain pyramids of energy and pyramids of numbers
- Explain biomass and how it is represented
- Compare and contrast exponential and logistic growth in populations
- Explain carrying capacity, steady state and cyclic growth as they relate to populations

- Explain density dependent and independent factors that affect populations and limit/control population growth
- Compare and contrast symbiotic relationships, mutualism, parasitism, commensalism
- Explain and give examples of competition, predation, herbivory, carnivory, omnivory

### Cell and Cell processes

- Cell theory, organelles, structure and function
- Cell division, meiosis and mitosis
- Prokaryotic and eukaryotic cells
- Photosynthesis and respiration

### Genetics

- Punnett squares, Mendel, alleles, crosses
- Phenotype and genotype
- Phenotypic and genotypic ratios
- Heterozygous and homozygous
- Hybrid
- Dominance and codominance, recessive alleles

### Viruses

- identify criteria for classifying organisms as living
- describe the basic structure of a virus, including the antigens, the membranous envelope, the protein capsid, and the nucleic acid core (DNA or RNA)
- identify the role of the host cell in viral reproduction
- compare the lytic and lysogenic cycles
- evaluate the effects of viruses on human health
- define and give examples of viral specificity
- describe the body's basic lines of defence against a viral attack, including– primary line of defence (e.g., skin, mucous membranes, tears)– secondary line of defence (e.g., phagocytic white blood cells engulf viruses)– tertiary line of defence (e.g., white blood cells called lymphocytes produce antibodies)
- give examples of ways to reduce the spread of viral diseases

### Kingdom Monera

- analyse monerans as a lifeform at the prokaryotic level of organization
- examine monerans and identify the characteristics that unify them
- use examples to illustrate moneran diversity with respect to the following:– classification– shape and grouping of cells – motility– ecological role– nutrition (fermentation, aerobic respiration, photosynthesis)– reproduction (binary fission, conjugation)– human diseases
- give examples of the beneficial roles of bacteria

- evaluate the effectiveness of various antibiotics, disinfectants, or antiseptics on bacterial cultures
- explain how bacteria mutate to become resistant to antibiotics

### Kingdom Protista

- Describe the unifying characteristics of the Kingdom Protista
- Describe the characteristics of animal-like, plant-like, and fungus-like protists
- Give examples of members of Kingdom Protista and describe their feeding, locomotion, respiration, reproduction, and ecological role

### Kingdom Animalia

- analyse how the increasing complexity of animal phyla represents an evolutionary continuum
- compare phyla in terms of– levels of organization – cell, tissue, organ, organ system– cephalization– development of a coelom– symmetry– reproduction
- describe the life functions animals need to survive, including– feeding– respiration– internal transport– excretion– reproduction– response and motility
- compare the advantages and disadvantages of different ways animals carry out their life functions (e.g., filter feeding vs. fluid feeding, parasitic vs. free-living, asexual vs. sexual reproduction, sessile vs. motile)
- analyse the increasing complexity of the Phylum Porifera and the Phylum Cnidaria
- examine members of the Phylum Porifera and identify their unifying characteristics
- describe how poriferans carry out their life functions
- examine members of the Phylum Cnidaria and identify their unifying characteristics
- describe how cnidarians carry out their life functions
- compare polyp and medusa with respect to structure, general function, and motility
- suggest the advantages of a motile form in the life cycle of a cnidarian
- explain the evolutionary significance of colonial (poriferan) versus multicellular (cnidarian) lifeforms
- describe the ecological roles of sponges and cnidarians
- analyse the increasing complexity of the Phylum Platyhelminthes, the Phylum Nematoda, and the Phylum Annelida
- examine members of the Phylum Platyhelminthes and describe their unifying characteristics
- describe how platyhelminthes carry out their life functions
- examine members of the Phylum Nematoda and describe their unifying characteristics
- describe how nematodes carry out their life functions
- examine members of the Phylum Annelida and describe their unifying characteristics
- describe how annelids carry out their life functions
- describe the physical changes that were necessary for flatworms and roundworms to become parasitic
- evaluate the characteristics of a successful parasite

- describe human disorders that are caused by non-segmented worms
- compare platyhelminthes, nematodes, and annelids with respect to evolutionary changes
- describe the ecological roles of platyhelminthes, nematodes, and annelids
- analyse the increasing complexity of the Phylum Mollusca, the Phylum Echinodermata, and the Phylum Arthropoda
- examine members of the Phylum Mollusca and describe their unifying characteristics
- describe how molluscs carry out their life functions
- examine members of the Phylum Echinodermata and describe their unifying characteristics
- describe how echinoderms carry out their life functions
- examine members of the Phylum Arthropoda and describe their unifying characteristics
- describe how arthropods carry out their life functions
- compare how molluscs, echinoderms, and arthropods have evolved to adapt to different niches
- demonstrate a knowledge of the diverse ecological roles of molluscs, echinoderms, and arthropods
- relate the complexity of the form and function of vertebrates to the evolutionary continuum of animals
- examine members of the Subphylum Vertebrata and describe their unifying characteristics
- compare members of two or more classes of vertebrates
- compare the vertebrates and invertebrates in terms of increasing complexity, with reference to characteristics including– endoskeleton vs. exoskeleton – presence or absence of vertebral column – closed vs. open circulatory system
- describe the diverse ecological role of vertebrates

### Vocabulary

Scientific Method: conclusion, control, control group, controlled variable, dependent variable, experimental group, experimental variable, independent variable, repeatable procedure, sample size, scientific method, testable hypothesis

Taxonomy: binomial nomenclature, biochemical relationship, class, embryological relationship, eukaryotic cell, evolutionary relationship, family, genus, homologous structure, kingdom, order, phylum, prokaryotic cell, species, sub-phylum, taxonomy/taxon

Evolution: complementary base pairing, convergent evolution, divergent evolution, deoxyribonucleic acid (DNA), double helix, evolutionary change, gene flow, genetic drift, gradual change model, mutation, natural selection, nitrogenous base, non-random mating, punctuated equilibrium model, speciation, sugar-phosphate backbone

Ecology: carrying capacity, cellular respiration, chemical equations, climax community, commensalism, consumer, cyclic growth, decomposer, density-dependent factors, density-independent factors, ecological succession, energy flow, exponential growth, logistic growth, mutualism, parasitism,

photosynthesis, pioneer species, population, producer, products, pyramid of energy, reactants, steady state, symbiosis

Viruses: antibody, antigen, DNA, host cell, lymphocyte, lysogenic cycle, lytic cycle, membranous envelope, mucous membrane, nucleic acid core, phagocytic white blood cell, primary line of defence, protein capsid, RNA, secondary line of defence, tertiary line of defence, viral specificity, white blood cell

Monera: aerobic respiration, antibiotic, antiseptic, bacteria, binary fission, classification, conjugation, disinfectant, ecological role, fermentation, motility, mutate/mutation, photosynthesis, prokaryote, resistant/resistance

Animals: asexual reproduction, cell, cephalization, closed circulatory system, coelom, colonial, fluid feeding, endoskeleton, excretion, exoskeleton, filter feeding, free-living, internal transport, invertebrates, levels of organization, life functions, medusa, motility, motility/motile, multicellular, niche, open circulatory system, organ, organ system, parasite/parasitic, polyp, reproduction, respiration, response, sessile, sexual reproduction, symmetry, tissue, vertebral column