

Biology 11

Learning Outcomes



Adaption and Evolution

It is expected that students will:

- describe the basic structure of DNA
- identify the roles of DNA in evolution
- explain the role of sexual reproduction in variation and evolution
- describe the process of natural selection
- suggest conditions under which the allelic frequencies of a population could change, including genetic drift, differential migration, mutation, and natural selection
- differentiate among and give examples of convergence, divergence, and speciation
- compare and contrast the gradual change model with the punctuated equilibrium model of evolution
- identify the role of extinction in evolution



Microbiology (Viruses)

It is expected that students will:

- describe the basic structure of a virus
- evaluate the evidence used to classify viruses as living or non-living
- compare and contrast the lytic and lysogenic cycles
- describe the body's basic lines of defence against a viral attack
- give examples of ways to reduce the chance of contracting a viral disease
- define and give examples of viral specificity
- evaluate the effects of virulence on human health



Microbiology (Kingdom Monera)



It is expected that students will:

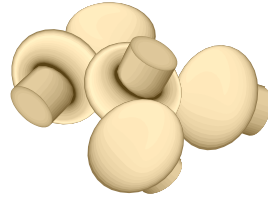
- describe the basic structure of a prokaryotic cell
- examine members of the Kingdom Monera and describe characteristics that unify them
- use examples to illustrate moneran diversity with respect to the following: form, distribution, motility, ecological role, nutrition, and human diseases
- differentiate among fermentation, aerobic respiration, and photosynthesis in monerans
- contrast the ways in which bacterial decomposers and parasites obtain their food
- demonstrate sterile technique while preparing a streak plate
- demonstrate the correct use of a compound microscope
- evaluate the effectiveness of various antibiotics, disinfectants, and antiseptics on bacteria cultures
- explain processes by which bacteria adapt to become resistant to antibiotics
- give examples of the beneficial roles of bacteria

Microbiology (Kingdom Protista)

It is expected that students will:

- examine members of the Kingdom Protista and describe the characteristics that unify them
- prepare wet-mount slides
- differentiate between phytoplankton and zooplankton by observing living protists
- compare and contrast a prokaryotic cell (moneran) to a eukaryotic cell (protist)
- demonstrate how knowledge of a pathogenic protist's life cycle can be used to control its spread
- relate the structural adaptations of protists to their diverse roles in food chains

Mycology

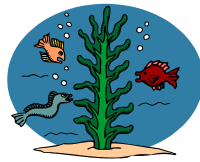


It is expected that students will:

- examine members of the Kingdom Fungi and describe characteristics that unify them
- demonstrate sterile technique while preparing cultures
- devise experiments using the scientific method
- demonstrate and evaluate the suitability of various growth conditions for fungi
- relate the adaptations of fungi to their diverse roles in ecosystems



Plant Biology (Green Algae, Mosses, Ferns)



It is expected that students will:

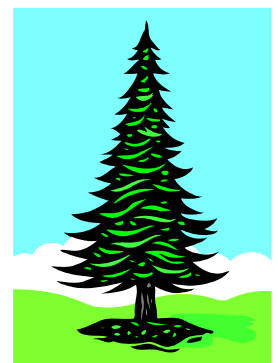
- examine green algae, mosses, and ferns and describe characteristics that unify each
- demonstrate the correct use of the dissection microscope
- explain the benefits of alternation of generations
- use examples of unicellular, colonial, and multicellular green algae to illustrate their diversity
- describe the ecological roles of green algae, mosses, and ferns
- describe the role of mosses as pioneer plants
- compare and contrast how ferns and mosses have adapted to a land environment



Plant Biology (Gymnosperms)

It is expected that students will:

- describe the characteristics that unify gymnosperms
- explain how gymnosperms are adapted for survival in a land environment with respect to the following: alternation of generations, needles, seeds, pollen, vascular tissue
- explain the role of meristems in primary and secondary stem growth
- evaluate the economic and ecological importance of gymnosperms

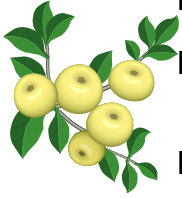


Plant Biology (Angiosperms)



It is expected that students will:

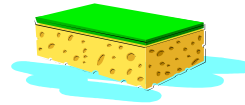
- examine angiosperms and describe characteristics that unify them
- compare and contrast the ways in which angiosperms and gymnosperms have adapted to a land environment
- use specimens to differentiate between monocots and dicots



Animal Biology (Porifera, Cnidaria)

It is expected that students will:

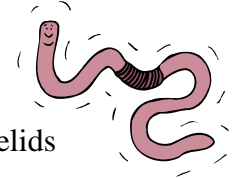
- examine members of the Phylum Porifera and Phylum Cnidaria and describe characteristics that unify each
- explain the process of filter feeding in a sponge
- demonstrate knowledge of the ecological roles of sponges and cnidarians
- compare and contrast polyp and medusa with respect to structure, general function, and motility
- suggest the advantages of a motile form in the life cycle of a cnidarian
- explain the evolutionary significance of multicellular (cnidarian) versus colonial (poriferan) life forms



Animal Biology (Platyhelminthes, Nematoda, Annelida)

It is expected that students will:

- examine members of the Phylum Platyhelminthes, Phylum Nematoda, and Phylum Annelida, and describe characteristics that unify each
- demonstrate safe and correct dissection techniques
- contrast the structural features of platyhelminthes, nematodes, and annelids
- examine and explain physical changes that were necessary for flatworms to become parasitic
- demonstrate knowledge of the ecological roles of the platyhelminthes, nematodes, and annelids
- evaluate the characteristics of a successful parasite



- compare platyhelminthes, nematodes, and annelids with respect to evolutionary changes
- demonstrate knowledge of human disorders that are caused by non-segmented nematodes

Animal Biology
(Mollusca, Echinodermata)

It is expected that students will:



- examine members of the Phylum Mollusca and Phylum Echinodermata and describe characteristics that unify each
- compare and contrast members of two or more classes of molluscs
- demonstrate a knowledge of the adaptations of molluscs and echinoderms
- demonstrate a knowledge of the diverse ecological roles of molluscs and echinoderms



Animal Biology
(Arthropoda)



It is expected that students will:

- examine members of the Phylum Arthropoda and describe characteristics that unify them
- contrast members of two or more classes of arthropods
- demonstrate a knowledge of the adaptations of arthropods to a terrestrial environment
- demonstrate an appreciation of the diverse ecological and economic importance of arthropods



Animal Biology
(Chordata-Subphylum Vertebrata)



It is expected that students will:

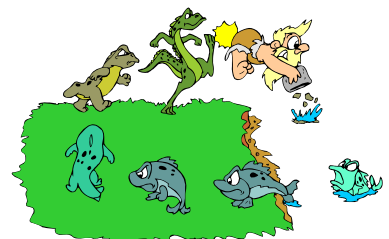
- examine members of vertebrates and describe characteristics that unify them
- contrast members of two or more classes of vertebrates
- contrast the structure and function of the exoskeleton to the endoskeleton
- demonstrate knowledge of the diverse ecological role of vertebrates



Ecology

It is expected that students will:

- describe factors that limit and control population growth
- suggest reasons for cyclic population fluctuations



- solve simple population problems based on changes in natality, mortality, immigration, and emigration
- collect, display, and interpret data
- define and describe a pyramid of energy in terms of energy flow through an ecosystem
- demonstrate knowledge of the process of succession
- compare photosynthesis and cellular respiration in terms of the reactants, products, chemical equations, and organelles responsible
- describe the roles of photosynthesis and cellular respiration

