

# BIOLOGY

## SECOND SEMESTER FINAL REVIEW GUIDE

### Chapter 12 – DNA and RNA

- Summarize the relationship between genes and DNA
- Describe the overall structure of the DNA molecule
- Summarize the events of DNA replication
- Relate the DNA molecule to chromosome structure
- Explain how RNA differs from DNA
- Name the three main types of RNA
- Describe transcription and editing of RNA
- Identify the genetic code
- Summarize translation
- Explain the relationship between genes and proteins
- Contrast gene mutations and chromosomal mutations

### Chapter 13 - Genetic Engineering

- Explain the purpose of selective breeding
- Describe two techniques used in selective breeding
- Explain how scientists manipulate DNA
- Summarize what happens during transformation
- Explain how you can tell if a transformation experiment has been successful
- Describe transgenic organisms
- Summarize the main steps in cloning

### Chapter 14 - The Human Genome

- Identify the types of chromosomes in a human karyotype
- Explain how sex is determined
- Explain how pedigrees are used to study human traits
- Describe examples of the inheritance of human traits
- Explain how small changes in DNA cause genetic disorders
- Identify characteristics of human chromosomes
- Describe two sex-linked disorders and explain why they are more common in males
- Explain the process of X-Chromosome inactivation
- Summarize nondisjunction and the problems it causes
- Summarize DNA fingerprinting
- State the goal of the Human Genome Project
- Describe how researchers are attempting to cure genetic disorders

### Chapter 15 - Darwin's Theory of Evolution

- Describe the pattern Darwin observed among organisms of the Galapagos Islands
- State how Hutton and Lyell described geologic change
- Describe Malthus' theory of population growth
- Describe how natural variation is used in artificial selection
- Explain how natural selection is related to species' fitness
- State Darwin's theory of evolution by natural selection
- Summarize the evidence that supports evolution

### Chapter 16 - Evolution of Populations

- Explain what a gene pool is
- Identify the main sources of inheritable variation in a population
- Explain Hardy-Weinberg genetic equilibrium

### Chapter 17 - The History of Life (17.1 and 17.4 only)

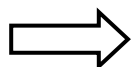
- Describe the fossil record
- State the information that relative dating and radiometric dating provide about fossils
- Identify important patterns of macroevolution.

### Chapter 18 - Classification

- Describe binomial nomenclature
- Explain Linnaeus' system of classification
- Explain how evolutionary relationships are important in classification
- Name the six kingdoms of life and how they are identified
- Describe the three domain system of classification

### Chapter 19 - Bacteria and Viruses

- Explain how the two groups of prokaryotes differ
- Describe the factors that are used to identify prokaryotes
- Explain why bacteria are vital to life on this planet



- Describe the structure of a virus
- Explain how viruses cause infection
- Explain how bacteria cause disease
- Describe how bacterial growth can be controlled

#### Chapter 20 - Protists

- Explain what a protist is
- Summarize how protists are classified
- Describe the ecological role of protists

#### Chapter 21 - Fungi

- Identify the defining characteristics of fungi
- Describe the main structure of a fungus
- Explain how fungi reproduce
- Describe the ecological role of fungi

#### Chapter 22 – Plant Diversity

- Explain what a plant is.
- Describe what plants need to survive.
- Summarize the angiosperms.

#### Chapter 26 - Sponges and Cnidarians

- List the characteristics that all animals share
- Describe the essential functions that animals carry out
- Explain what a sponge is
- Describe how sponges carry out essential life functions
- Describe the ecology of sponges
- Explain what a cnidarians is
- Describe the two body plans that exist in the cnidarians life cycle
- Describe how cnidarians carry out basic life functions
- Identify the groups of cnidarians
- Describe the ecology of cnidarians

#### Chapter 27 - Worms and Mollusks

- Describe the defining characteristics of flatworms, roundworms, and segmented worms
- Summarize the structure and function of earthworms
- Describe the ecology of earthworms
- Describe the defining characteristics of mollusks
- Identify the three main classes of mollusks
- Describe the ecology of mollusks

#### Chapter 28 - Arthropods and Echinoderms

- Identify the defining characteristics of arthropods
- Explain growth and development in arthropods
- Explain how arthropods are classified
- Identify the distinguishing features of insects
- Describe the two types of development in insects
- Explain what types of insects form societies
- Identify the distinguishing features of echinoderms
- Describe the functions carried out by the water vascular system

#### Chapter 30 - Fish, and Amphibians

- Identify the basic features of fish
- Explain how fish are adapted for life in water
- Describe the structure and function of bony fish
- Identify the basic characteristics of amphibians
- Describe the structure and function of the frog

#### Chapter 31 - Reptiles and Birds

- Describe the characteristics of reptiles and birds

#### Chapter 32 - Mammals

- List the characteristics of mammals

For **EACH** chapter:

- Review the key concepts at the end of chapter
- Understand vocabulary
- Chapter *Self-Test* at [millerandlevine.com](http://millerandlevine.com) (link on my web site)