2017-2018 Biology Semester 1 Benchmark Review

General Resources

www.brainpop.com - Sign in with username and password provided by your teacher

https://ecsd-fl.schoolloop.com/BiologyEOCReview - Select the benchmark you wish to review from the menu bar on the left, and then select the tutorial you wish to view.

Directions: Your teacher may assign you particular Benchmarks & Topics to review, based on assessment data (Student Success Document). To help master that benchmark, select the links from left to right through the row completing each of the review materials.

Benchmark & Topic	**Green Alligator Textbook & Interactive Reader:** Read the corresponding pages in the text and complete any questions in the Interactive Reader.	**Khan Academy:** Read, watch the videos while taking notes, and answer any Skills Check Questions.	**Video Clip or Animation/Tutorial:** Watch the video or animation/tutorial.	**Online Interactive Game or Lab:** Complete the lab or play the game.	**Vocabulary Quizlets:** Review the vocabulary flashcards.	**Exit Questions:** Provide a detailed answer to each exit question.	**Self-Assessment:** Test yourself with these sample questions.
SC.912.L.14.1 Cell Theory Describe the scientific theory of cells (cell theory) and relate the history of its discovery to the process of science	**Text:** Chapter 3 Section 3.1 *Pages 70-71* **IR**: page 37	Intro to Cells Quick Read Cell Theory Video	Cell Theory Discoveries Explained	Cell Theory quiz game Cell Theory quiz	Cell Theory	**What are the components of Cell Theory?** **How did scientific investigations play a role in developing Cell Theory?**	Sample Cell Theory Questions
SC.912.L.14.2 Plant and Animal Cells Relate structure to function for the components of plant and animal cells. Explain the role of cell membranes as a highly selective barrier (passive and active transport).	**Text:** Chapter 3 Section 3.2 *Pages 73-79* Section 3.3 *Pages 81-84* Section 3.4 *pages 84-88* Section 3.5 *pages 89-91* **IR:** pages 39-50	Nucleus & Ribosome Quick Read Endoplasmic Reticulum & Golgi Bodies Video Mitochondria & Chloroplast Quick Read Mitochondria Video Cell Structure Skill Check	Inside a Cell Osmosis Video Refresher Brainpop: Passive Transport Brainpop: Active Transport Crash Course Membrane Transport	Cell Organelles & their Functions Quiz Bioman: Build a Cell Parts of the Cell Quiz Movement across cell membrane animation	Cell Membranes Cell Structures	**How is the structure of each cell part related to its function: cytoplasm, ribosomes, nucleus, nuclear envelope, nucleolus, endoplasmic reticulum, vacuoles, mitochondria, golgi apparatus, chloroplasts, lysosomes, cell wall, cell membrane, cilia, and flagella?** **How does the structure of the cell membrane relate to its function?**	Sample Prokaryote, Eukaryote, Cell Membrane & Transport Questions

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SC.912.L.14.2 Plant and Animal Cells (Continued)		Plasma Membrane Quick Read Cell Membrane Video Concentration Gradient Video Osmosis & Tonicity Quick Read Osmosis Video Tonicity Video Diffusion & Osmosis Video Membrane, Diffusion & Osmosis Skill Check Diffusion & Passive Transport Quick Read Passive Transport Video Facilitated Diffusion Video Active Transport Quick Read		Bioman: Cell membrane game		**What is the role of the cell membrane during passive transport?** **What is the role of the cell membrane during active transport?**	

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SC.912.L.14.3 Comparing Cells Compare and contrast the general structures of plant and animal cells. Compare and contrast the general structures of prokaryotic and eukaryotic cells.	**Text:** Chapter 3 Sections: 3.1 *Page 72* Section 3.2 *Page 74* **IR**: pages 38, 41	Prokaryotic Cell Quick Read Eukaryotic Cell Quick Read Pro & Eukaryotic Cell Video Endomembrane System Video Plant & Animal Cell Video	Prokaryotes and Eukaryotes Video Refresher Assignment Discovery: Introduction to Cells Assignment Discovery: Eukaryotic Cells Crash Course Animal Cells Crash Course Plant Cells	Cells Alive: Animal & Plant Cell Structures Bioman: Animal cell	Plant-vs-Animal Cells Flash Cards Prokaryotic vs Eukaryotic Cells Flash Cards	**How would you use cell structures to classify a cell as prokaryotic or eukaryotic? Plant or Animal?**	Sample Prokaryote, Eukaryote, Cell Membrane & Transport Questions
SC.912.L.15.1 Evidence for Evolution Explain how the scientific theory of evolution is supported by the fossil record, comparative anatomy, comparative embryology, biogeography, molecular biology, and observed evolutionary change.	**Text:** Chapter 10 Section 10.4 *Pages 310-313* Chapter 12 Section 12.6 *Pages 379-383* **IR**: pages 164-165; 173-175; 215-218	Evidence for Evolution Reading Evidence for Evolution Video Human Evolution Overview Video	Evolution in 2 Minutes Brain Pop: Human Evolution Bozeman: Evidence for Evolution Fossils: Rocking the Earth DNA Spells Evolution	NOVA: Evolution Lab NOVA: Human Evolution Interactive	Theory of Evolution	**How is the scientific theory of evolution supported by the fossil record, comparative anatomy, comparative embryology, biogeography, molecular biology, and observable evolutionary change?**	Sample Evolution Questions

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(Continued) **Also assesses** **SC.912.L.15.10 Trends in Hominid Evolution** Identify basic trends in hominid evolution from early ancestors six million years ago to modern humans, including brain size, jaw size, language, and manufacture of tools.			Biogeography Crash Course: Evolution Stated Clearly: Evidence for Evolution Stated Clearly: What is Evolution? Stated Clearly: Does the Theory of Evolution Really Matter?			**What are examples of and trends in hominid evolution from early ancestors to modern humans?**	
SC.912.L.15.13 Conditions for Natural Selection Describe the conditions required for natural selection, including: overproduction of offspring, inherited variation, and the struggle to survive, which result in differential reproductive success.	**Text:** Chapter 10 Section 10.3 *Pages 304-309* **IR:** pages 169-172	Introduction to Evolution & Natural Selection Video Natural Selection & the Owl Butterfly Variation in a Species Evolution & Natural Selection Skill Check	Brain Pop: Natural Selection Learn Biology: Natural Selection Amoeba Sisters: Natural Selection & Bacterial Resistance Crash Course: Natural Selection Stated Clearly: Natural Selection	Charles Darwin Game	Natural Selection	**What conditions are necessary for the process of natural selection to occur?**	Sample Natural Selection Questions

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SC.912.L.15.14 Genetic Drift & Gene Flow Discuss mechanisms of evolutionary change other than natural selection such as genetic drift and gene flow. Also Assesses: **SC.912.L.15.15 Genetic Variation** Describe how mutation and genetic recombination increase genetic variation.	**Text:** Chapter 11 Section 11.3 *Pages 335-337* *AND page 343* Section 11.1 *Pages 328-329* **IR:** pages 181-182, 186-188	Mechanisms of Evolution Quick Read (not Hardy-Weinberg) Genetic Drift Video Genetic Drift Quick Read	Stated Clearly: New Genetic Information Evolves Part 1 Stated Clearly: New Genetic Information Evolves Part 2 Mechanisms of Evolution Animation	Population Genetics Virtual Labs		**How do genetic drift, gene flow, nonrandom mating result in evolutionary change?** **How is genetic variation increased by mutations and genetic recombination?**	Sample Natural Selection Questions
SC.912.L.15.8 Origin of Life on Earth Describe the scientific explanations of the origin of life on Earth.	**Text:** Chapter 12, Section 12.3, pages 368-371 **IR:** pages 207-209	Hypotheses about the Origin of Life Reading	Miller Experiment Animation RNA Origin of Life Stated Clearly: Miller-Urey Stated Clearly: Chemical Evolution Stated Clearly: Origin of Life		Origin of Life	**How do scientists explain the origin of life on Earth?** **What situations or conditions contributed to the beginning of life on Earth?**	Sample Origin of Life Questions

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SC.912.L.16.1 Mendel's Laws Use Mendel's laws of segregation and independent assortment to analyze patterns of inheritance. **Also assesses** **SC.912.L.16.2 Inheritance Patterns** Discuss observed inheritance patterns caused by various modes of inheritance, including dominant, recessive, codominant, sex-linked, polygenic, and multiple alleles.	**Text:** Chapter 6, Sections 6.3, 6.4, 6.5 *Pages 177-187* Chapter 7 Sections 7.1 & 7.2 *Pages 200-207* **IR**: pages 96-104 & 110-113	Mendel & His Peas Reading Introduction to Heredity Video Punnett Square Fun Video Law of Segregation Reading & Checks Law of Independent Assortment Reading & Checks Overview of Variations on Mendel's Laws Quick Read Three Variations on Mendel's Laws Reading Sex Linked Traits Video Classical Genetics Skill Check	Brainpop: Genetics Brainpop: Heredity Mendel Animation Crash Course Heredity Beginner's Guide to Punnett Squares Monohybrid Crosses Video Refresher Dihybrid Crosses Video Refresher Sex-linked Traits Video Refresher Multiple Alleles Video Refresher Incomplete & Codominance, Polygenic Traits Video Refresher	Mendels Laws Interactive Mendelian Genetics Lab Bioman: Diversity & Dihybrid Crosses	Genetics	**How do Mendel's Laws of Segregation and Independent Assortment impact inheritance patterns?** **How do codominance, incomplete dominance, multiple alleles, sex-linkage, and polygenic inheritance impact inheritance patterns?**	Sample Mendel's Laws & Inheritance Patterns Questions

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SC.912.L.16.14 Cell Cycle & Mitosis Describe the cell cycle, including the process of mitosis. Explain the role of mitosis in the formation of new cells and its importance in maintaining chromosome number during asexual reproduction.	**Text:** Chapter 5 Sections 5.1, 5.2, 5.4 *Pages 134-14, 148-150* **IR**: pages 74-79, 82-83	DNA & Chromosomes Quick Read Chromosomes, Chromatids, Chromatin Video Phases of the Cell Cycle Quick Read Interphase Video Phases of Mitosis Quick Read Mitosis Video Mitosis Skill Check Cell Division Skill Check	Mitosis Video Refresher Mitosis Explained Crash Course Mitosis Assignment Discovery Cell Reproduction and Growth Mitosis Animation	Cells Alive: Cell Cycle Cells Alive: Mitosis	Cell Division	**What events occur in the cell cycle, including mitosis & cytokinesis?**	

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SC.912.L.16.16 Meiosis Describe the process of meiosis, including independent assortment and crossing over. Explain how reduction division results in the formation of haploid gametes or spores.	**Text:** Chapter 6 Sections 6.1, 6.2 *Pages 168-176* **IR**: pages 90-95, 105-106	Meiosis Quick Read Crossing Over in Meiosis Video Phases of Meiosis I Video Phases of Meiosis II Video	Meiosis Video Refresher Meiosis Animation Crash Course Meiosis Meiosis Explained	Cells Alive: Meiosis Bioman: Meiosis & Genetics		**What events occur in meiosis, including independent assortment & crossing over?**	
SC.912.L.16.17 Mitosis vs. Meiosis Compare and contrast mitosis and meiosis and relate to the processes of sexual and asexual reproduction and their consequences for genetic variation.	**Text: :** Chapter 6 Sections 6.1 *Pages 168-171* **IR**: 90-92	Comparing Meiosis & Mitosis Video				**How are the processes of mitosis and meiosis both alike and different?** **Why can meiosis create genetic variation while mitosis cannot?**	Sample Mitosis, Meiosis, Cell Cycle & Cancer Questions
SC.912.L.16.3 DNA & Genetic Information Describe the basic process of DNA replication and how it relates to the transmission and conservation of the genetic information.	**Text:** Chapter 8 Sections 8.2, 8.3, *Pages 230-238* **IR**: pages 126-131	Nucleic Acid Reading DNA Video Molecular Structure of DNA Video Antiparallel Structure Video	Brainpop: DNA Stated Clearly DNA Stated Clearly Gene DNA Structure & Function Video Refresher	The Double Helix Game Build a DNA Molecule Tour of Basic Genetics	DNA replication	**What is the basic process of DNA replication?**	

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(Continued) Also Assesses SC.912.L.16.9 Universal Genetic Code Explain how and why the genetic code is universal and is common to almost all organisms.		Mode of DNA Replication Reading The Genetic Code Reading	Crash Course DNA Structure and Replication DNA Replication Video Refresher				
SC.912.L.16.4 Mutations Explain how mutations in the DNA sequence may or may not result in phenotypic change. Explain how mutations in gametes may result in phenotypic changes in offspring.	**Text:** Chapter 8 Sections 8.7 *Pages 252-255* **IR**: pages 142-144	Intro to Genetic Mutations Video Different Types of Mutations Video Effects of Mutations Video	Brainpop: Genetic Mutations Mutation Video Refresher Mutations Explanation	Genetic Mutations lab Outcome of Mutations Interactive		**How can a mutation in the DNA sequence of a chromosome cause a change in a person's physical appearance?**	
SC.912.L.16.5 Transcription & Translation Explain the basic processes of transcription and translation, and how they result in the expression of genes.	**Text:** Chapter 8 Sections 8.4, 8.5 *Pages 239-247* **IR**: pages 132-138	DNA Replication, Transcription & Translation Video Alleles & Genes Video Transcription Reading Translation Reading	Crash Course Transcription Translation Brainpop: RNA RNA vs DNA Video Refresher Protein Synthesis Video Refresher	Transcribe Interactive RNA Interactive		**What are the roles of transcription and translation in the expression of genes?**	Sample DNA, Transcription, Translation & Mutations Questions
SC.912.L.16.8 Regulation & Cancer Explain the relationship between mutation, cell cycle, and uncontrolled cell growth potentially resulting in cancer.	**Text:** Chapter 5 Sections 5.3 *Pages 144-147* **IR**: pages 80-81	Cancer & Cell Cycle Reading Cancer Video	Cell Cycle & Cancer Video Refresher	Mutations and Cell Division Interactive		**How does a mutation in the genes that control the cell cycle potentially result in cancer?**	

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SC.912.L.18.1 Macromolecules Describe the basic molecular structures and primary functions of the four major categories of biological macromolecules.	**Text:** Chapter 2 Sections 2.3 *Pages 44-48* **IR**: pages 25-29	Intro to Macromolecules Quick Read Carbohydrate Structure Video Lipid Structure Video DNA Structure Video RNA Structure Video Amino Acid/Protein Video	Biological Molecules-You are what you eat Macromolecules Video Refresher Brainpop: Body Chemistry	Macromolecule virtual lab	Organic molecules	**What are the four categories of macromolecules?** **How can you describe the basic molecular structure of each?** **What are the functions of each?**	Sample Macromolecules & Enzymes Questions
SC.912.L.18.11 Enzyme Activity Explain the role of enzymes as catalysts that lower the activation energy of biochemical reactions. Identify factors, such as pH and temperature, and their effect on enzyme activity.	**Text:** Chapter 2 Sections 2.4, 2.5 *Pages 52-56* **IR**: pages 31-34	Activation Energy Quick Read Enzyme Video	Enzymes and Activation Energy Animation Factors Affecting Enzyme Activity Video	Enzymatic Game	Enzyme Flashcards	**How does a catalyst affect the activation energy of a chemical reaction?** **What type of macromolecule are enzymes?** **What are the functions of enzymes in living things? Describe some factors that affect enzyme activity.**	

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SC.912.N.1.1Scientific Processes Define a problem based on a specific body of knowledge, for example: biology.	**Text:** Chapter 1 Sections 1.3 *Pages 13-17* **IR**: pages 9-11	Scientific Method Quick Read Scientific Method Video Controlled Experiments Quick Read	Scientific Method Tutorial	The Real Process of Science Interactive	Scientific-method-flash-cards	**Explain why the Real process of science in a non-linear process.**	Sample Nature of Science Questions
SC.912.N.1.4Reliability of Sources Identify sources of information and assess their reliability according to the strict standards of scientific investigation.			Not all scientific studies are created equal Video			**Describe <u>each</u> of these standards of Science: controlled variables, sufficient sample size, replication of results, empirical and measurable evidence, and the concept of falsification.**	
SC.912.N.1.6 Scientific Inferences Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.			Observation vs Inference Tutorial Observations and Inferences Video		Observation vs Inference Flash Cards	**How are scientific inferences made from scientific observations?**	

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SC.912.N.2.1 What is Science Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).			What is Science Video Science Checklist Science has Limits Quick Read	How Science Works Interactive What is Science		**What are some criteria that can be used to differentiate science from pseudoscience?**	
SC.912.N.3.1 Scientific Theory Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer. **SC.912.N.3.4 Theory vs. Law** Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.	**Text:** Chapter 1 Sections 1.3 *Pages 16-17* **IR**: pages 10-11		Theory vs. Law vs. Hypothesis Video What is the difference between a scientific law and theory Video Even Theories Can Change Quick Read			**Compare and Contrast scientific theories and scientific laws.**	