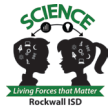




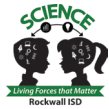
# Rockwall ISD Biology on-level Year-at-a-Glance



	Term 1	Term 2	Term 3	Term 4
Focus TEKS ESSENTIAL	<u>Unit 1</u> <b>9A</b> <u>Unit 2</u> 4A, <b>4B</b> , 4C <u>Unit 3</u> <b>9B</b> , 9C	<u>Unit 4</u> <b>6A</b> , 6B, <b>6C</b> , 6D, 6E <u>Unit 5</u> <b>5A</b> , 5B, 5C <u>Unit 6</u> <b>6F</b> , 6G	<u>Unit 7</u> <b>7A</b> , 7B, <b>7C</b> , 7D, 7E, 7F <u>Unit 8</u> 8A, 8B, 8C <u>Unit 9</u> <b>10B</b> , 10C	<u>Unit 10</u> <b>10A</b> , 10C <u>Unit 11</u> 11A, 11B, 12A, 12B, 12C, 12D, 12E
Topic Focus	<u>Unit 1</u> Biomolecules + wet labs <u>Unit 2</u> Cells + Viruses <u>Unit 3</u> Energetics + Enzymes	<u>Unit 4</u> DNA, Protein Synthesis + Mutations <u>Unit 5</u> Cell Cycle <u>Unit 6</u> Genetics + Meiosis	<u>Unit 7</u> Evolution <u>Unit 8</u> Taxonomy <u>Unit 9</u> Plant Systems	<u>Unit 10</u> Animal Systems <u>Unit 11</u> Ecology
Resources	<u>Unit 1</u> <b>Chapter 2</b> <u>Unit 2</u> <b>Chapter 3</b> <u>Unit 3</u> <b>Chapter 4</b>	<u>Unit 4</u> <b>Chapter 8</b> <u>Unit 5</u> <b>Chapter 5</b> <u>Unit 6</u> <b>Chapter 6</b>	<u>Unit 7</u> <b>Chapter 10</b> <u>Unit 8</u> <b>Chapter 17</b> <u>Unit 9</u> <b>Chapter 21</b>	<u>Unit 10</u> <b>Chapter 28</b> <u>Unit 11</u> <b>Chapter 14</b>
Key Concepts	<b>Unit 1</b> <ul style="list-style-type: none"> <li>Compare &amp; contrast the function of the 4 major organic compounds.</li> <li>Function of lipids in cell membrane</li> <li>Recognize that genetic material is found in all living things.</li> <li>Understand the role of proteins</li> <li>Recognize monomers and polymers of all 4 biomolecules</li> <li>Recognize basic shapes of all 4 biomolecules</li> <li><b>Include structure of biomolecules</b></li> <li><b>Water properties (surface tension, polarity - touch on)</b></li> </ul>	<b>Unit 4</b> <ul style="list-style-type: none"> <li>Structure of a nucleotide (including hydrogen bond)</li> <li>Sequence of nitrogenous bases</li> <li>Historical contributions: Griffith, Avery, Hershey &amp; Chase, Watson &amp; Crick, Chargaff, and Franklin.</li> <li>DNA is the hereditary, informational molecule.</li> <li>DNA is a double-helix</li> <li>Practice reading DNA Fingerprints</li> <li>The sequence of nucleotides (nitrogen bases) affects transcription and translation; changes can lead to mutations.</li> <li>Process, and location of transcription and translation (including figures)</li> </ul>	<b>Unit 7</b> <ul style="list-style-type: none"> <li>Definition of Evolution</li> <li>Evidence of common ancestry among species comes from many sources:               <ul style="list-style-type: none"> <li>Fossils</li> <li>Biogeography</li> <li>Embryology</li> <li>Anatomical structures (homologous/analogous)</li> <li>Molecular biology (DNA)</li> </ul> </li> <li>Commonality of the genetic code</li> <li>Acquired traits vs inherited</li> <li>Gradualism and punctuated equilibrium</li> <li>Principles of Darwin's Theory of Natural Selection</li> </ul>	<b>Unit 10</b> <ul style="list-style-type: none"> <li>Feedback loops accomplish homeostasis*</li> <li>Levels of organization</li> <li>Function of lymphatic and immune Systems in Humans</li> <li>Coordinated interactions of major organ systems to do regulation</li> <li>Coordinated interactions of major organ systems to do nutrient absorption</li> <li>Coordinated interactions of major organ systems to do reproduction</li> <li>Coordinated interactions of major organ systems to provide defense</li> </ul>



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## • **Catabolism and anabolism (dehydration synthesis, hydrolysis)**

### **Unit 2**

- Compare and contrast prokaryotic and eukaryotic cell organelles
- Common organelle functions - Cytoplasm, Ribosome, Cell membrane, Genetic material
- Eukaryotic exclusive membrane-bound organelle functions - Nucleus, SER, RER, Golgi body, Mitochondria, Chloroplasts, Lysosomes, Vacuole
- Other organelle functions - Cell wall, Flagella, Cilia, Cytoskeleton, Centrioles
- Cell organelle role in cell differentiation
- Concentration gradients in role in transport and homeostasis - including terms hypotonic, hypertonic, and isotonic
- Passive transport does not require energy input
- Passive transport examples include simple diffusion and facilitated diffusion (including osmosis).
- Active transport does require energy input
- Active transport examples include pumping against a concentration gradient, endocytosis, and exocytosis

- Identify gene and chromosomal mutations
- Gene regulation is controlled by internal and external factors
- Significance of sequence of nucleotides on traits
- Genes can be turned on or off in gene regulation
  - **Repressors, activators, epigenetic control vs pre-transcriptional & post-transcriptional control**
  - **Types of point mutations**
  - **Cell communication / environment for gene regulation**

### **Unit 5**

- Explain the purpose of the cell cycle in relation to organism growth.
- Describe and order the stages of the Cell Cycle & Mitosis, including creation of spindle fibers.
- Describe how DNA expression impacts the regulation of the cell cycle, cancer.
- Checkpoints exist and errors in checkpoints lead to unregulated cell division (cancer)
- Chromatin vs. chromosome
- The process and timing of DNA replication
- Each of the 2 resulting strands is half original, half new (semi-conservative)

- Populations, not individuals, evolve.
- Sources of genetic variation
- Natural Selection vs Genetic Drift vs Artificial Selection and how they affect diversity.
- Gene Flow and how it affects diversity.
- Reproductive isolations that lead to speciation
- Phylogenetic / Cladistic classification
- Mutations provide a source of genetic variation for Evolution
  - **Intro to HWE**
  - **Speciation and reproductive isolation**
  - **Outcomes of natural selection (disruptive, directional, stabilizing)**

### **Unit 8**

- Benefits of binomial nomenclature
- Linnaeus' system of taxonomic division
- Binomial nomenclature naming rules
- Determination of relatedness through taxonomic similarities
- Hierarchy of taxa
- Characteristics of each Domain
  - Compare and contrast
- Characteristics of each Kingdom
  - Compare and contrast
- Dichotomous key interpretation

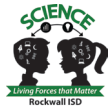
- Viruses and bacteria can affect the body's internal conditions (tie in from unit 2 and 8)
  - Positive and negative
- Compare to plant system similarities
- \* *Homeostasis is an overarching topic that is building off of Unit 2.*
  - **Diseases and disorders of systems**

### **Unit 11**

- Role of producers and decomposers (harmful and/or beneficial bacteria and fungi) in ecosystem
- Carbon and Nitrogen cycles: role of plants in Carbon Cycle, role of bacteria in the Nitrogen Cycle
- Primary and Secondary Ecological Succession
- Levels of ecosystem organization: individual organism to biosphere
- Species diversity
- Population diversity defined
- Population defined
- Community defined
- Biotic and Abiotic factors
- Food chains and food webs
- Energy / mass pyramids
- Homeostasis
- Biomagnification
- Autotrophs vs Heterotrophs
- Omnivores, Herbivores, Carnivores
- Symbiotic relationships



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- Definition of pathogen
- Anatomy/shape of a virus
- Viruses are non-living
- Bacteriophage host
- Lytic vs Lysogenic infections
- Use of Vaccines
- Implications of Viral genetic mutations, i.e. leading to re-infections during the same season or the need of a seasonal vaccine (flu)
- Use of antibiotics & antibiotic resistance
- Anatomy/Shapes of bacteria
- Examples of viruses: HIV, Influenza, Coronavirus, cold sore
- **Endosymbiotic theory**
- **Cell size vs. efficiency**
- **Characteristics of life**
- **Introduce cell communication with receptor proteins in membrane**

## Unit 3

- Identify & investigate the role of enzymes.
- Identify the enzyme-substrate complex. Concentrate on visuals.
- Enzymes have optimal temperature and pH ranges. Use graphs.
- Enzymes can become denatured.
- Photosynthesis is the energy transfer from solar to chemical
- Cellular respiration takes place in the mitochondrion

- Replication enzymes - DNA helicase and DNA polymerase
- Function of enzymes as related to DNA replication
- **Cyclins**
- **Checkpoints**
- **Leading and lagging strands**
- **Okazaki fragments**
- **3' and 5'**

## Unit 6

- Understanding how variation occurs due to meiosis and inheritance.
- Make Mendelian and Non-Mendelian genetic inheritance predictions.
- Meiosis and production of haploid gametes allows for variation in offspring; variation of traits occurs via different mechanisms, including mutations.
- Interpret and analyze pedigrees
- **Pedigrees type of inheritance with punnett square predictions**
- **Meiosis stages with pictures**
- **Compare mitosis and meiosis**
- **Introduction to  $\chi^2$**

- Forwards and backwards

- **Plant and animal phyla**

## Unit 9

- Describe transport and reproductive systems in plants.
- Explain the process of transpiration.
- Describe tropisms.
- Describe interactions occurring between systems.
- Different levels of organization in plant structure in relation to plant systems.

- Competition for resources
- **Introduction to Simpson's diversity index**
- **Population growth models**



## Rockwall ISD Biology on-level Year-at-a-Glance



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|--|--|--|--|
| <ul style="list-style-type: none"><li>• Photosynthesis takes place in the chloroplast</li><li>• ATP are energy molecules</li><li>• Photosynthesis: Light +H<sub>2</sub>O + CO<sub>2</sub> -&gt; C<sub>6</sub>H<sub>12</sub>O<sub>6</sub> + O<sub>2</sub></li><li>• Cellular Respiration: C<sub>6</sub>H<sub>12</sub>O<sub>6</sub> + O<sub>2</sub> -&gt; CO<sub>2</sub> + H<sub>2</sub>O + ATP</li><li>• Anaerobic vs Aerobic (&amp; examples)</li><li>• Steps of light dependent/independent</li><li>• Electron carriers</li><li>• Steps of Glycolysis, Krebs, ETC</li><li>• Enzyme inhibitors</li></ul> |  |  |  |
|--|--|--|--|