Tutorials are designed specifically for the Virginia Standards of Learning to prepare students for the Standards of Learning tests.

Biology Tutorials offer targeted instruction, practice, and review designed to help students develop fluency, deepen conceptual understanding, and apply scientific thinking skills. Students engage with the content in an interactive, feedback-rich environment as they progress through standards-aligned modules. By constantly honing their ability to explain and analyze biological scenarios, students build the depth of knowledge and higher-order skills required to demonstrate their mastery when put to the test.

In each module, the Learn It and Try It make complex ideas accessible through focused content, guided analysis, multi-modal representations, and personalized feedback as students reason through increasingly challenging problems. The Review It offers a high-impact summary of key concepts and relates those concepts to students' lives. The Test It assesses students' mastery of the module's concepts, providing granular performance data to students and teachers after each attempt. To help students focus on the content most relevant to them, unit-level pretests and posttests can quickly identify where students are strong and where they're still learning.

Unit 1: Chemistry of Life 1

- **CHARACTERISTICS OF LIFE**
  - BIO.2.a: The student will investigate and understand that chemical and biochemical processes are essential for life. Key ideas include water chemistry has an influence on life processes;
- **ENZYMES**
  - BIO.2.c: The student will investigate and understand that chemical and biochemical processes are essential for life. Key ideas include enzymes have a role in biochemical processes;

Unit 2: Chemistry of Life 2

- **BIOMOLECULES**
  - BIO.2.b: The student will investigate and understand that chemical and biochemical processes are essential for life. Key ideas include macromolecules have roles in maintaining life processes;
  - BIO.4.a: The student will investigate and understand that bacteria and viruses have an effect on living systems. Key ideas include viruses depend on a host for metabolic processes;
  - BIO.4.d: The student will investigate and understand that bacteria and viruses have an effect on living systems. Key ideas include bacteria and viruses have a role in other organisms and the environment; and
  - BIO.4.e: The student will investigate and understand that bacteria and viruses have an effect on living systems. Key ideas include the germ theory of infectious disease is supported by evidence.

Copyright© Edmentum Inc. All Rights Reserved.

Unit 3: Cell Structure and Function

- **PROKARYOTIC AND EUKARYOTIC CELLS**
  - BIO.3.b: The student will investigate and understand that cells have structure and function. Key ideas include structures in unicellular and multicellular organisms work interdependently to carry out life processes;
- **PLANT AND ANIMAL CELLS**
  - BIO.3.a: The student will investigate and understand that cells have structure and function. Key ideas include the cell theory is supported by evidence;
  - BIO.3.c: The student will investigate and understand that cells have structure and function. Key ideas include cell structures and processes are involved in cell growth and division;
- **PASSIVE TRANSPORT**
  - BIO.3.d: The student will investigate and understand that cells have structure and function. Key ideas include the structure and function of the cell membrane support cell transport; and
- **ACTIVE TRANSPORT**
  - BIO.3.d: The student will investigate and understand that cells have structure and function. Key ideas include the structure and function of the cell membrane support cell transport; and

Unit 4: Cellular Energetics

- **PHOTOSYNTHESIS**
  - BIO.2.e: The student will investigate and understand that chemical and biochemical processes are essential for life. Key ideas include the processes of photosynthesis and respiration include the capture, storage, transformation, and flow of energy.
- **CELLULAR RESPIRATION**
  - BIO.3.e: The student will investigate and understand that cells have structure and function. Key ideas include specialization leads to the development of different types of cells.

Unit 5: DNA Structure and Function 1

- **COMPONENTS OF DNA**
  - BIO.5.b: The student will investigate and understand that there are common mechanisms for inheritance. Key ideas include the structural model of DNA has developed over time;
- **THE GENETIC CODE**
  - BIO.5.a: The student will investigate and understand that there are common mechanisms for inheritance. Key ideas include DNA has structure and is the foundation for protein synthesis;

Unit 6: DNA Structure and Function 2

- **DNA REPLICATION**
  - BIO.4.b: The student will investigate and understand that bacteria and viruses have an effect on living systems. Key ideas include the modes of reproduction/replication can be compared;

Copyright© Edmentum Inc. All Rights Reserved.

Unit 7: Gene Expression

- **TRANSCRIPTION**
  - BIO.5.a: The student will investigate and understand that there are common mechanisms for inheritance. Key ideas include DNA has structure and is the foundation for protein synthesis;
- **TRANSLATION**
  - BIO.2.d: The student will investigate and understand that chemical and biochemical processes are essential for life. Key ideas include protein synthesis is the process of forming proteins which influences inheritance and evolution; and

Unit 8: Mutations and Reproduction

- **GENETIC CHANGES IN DNA**
  - BIO.7.b: The student will investigate and understand that populations change through time. Key ideas include genetic variation, reproductive strategies, and environmental pressures affect the survival of populations;
- **GENETIC CHANGES IN CHROMOSOMES**
  - BIO.7.b: The student will investigate and understand that populations change through time. Key ideas include genetic variation, reproductive strategies, and environmental pressures affect the survival of populations;
- **MEIOSIS**
  - BIO.5.d: The student will investigate and understand that there are common mechanisms for inheritance. Key ideas include meiosis has a role in genetic variation between generations; and

Unit 9: Heredity

- **MENDELIAN LAWS OF HEREDITY**
  - BIO.5.e: The student will investigate and understand that there are common mechanisms for inheritance. Key ideas include synthetic biology has biological and ethical implications.
- **MULTIPLE ALLELES AND ALLELES WITHOUT DOMINANCE**
  - BIO.5.c: The student will investigate and understand that there are common mechanisms for inheritance. Key ideas include the variety of traits in an organism are the result of the expression of various combinations of alleles;

Unit 10: Evolution 1

- **MULTIPLE LINES OF EVIDENCE**
  - BIO.7.a: The student will investigate and understand that populations change through time. Key ideas include evidence is found in fossil records and through DNA analysis;

Unit 11: Evolution 2

- **THE FOSSIL RECORD**
  - BIO.6.b: The student will investigate and understand that modern classification systems can be used as organizational tools for scientists in the study of organisms. Key ideas include fossil record

Copyright© Edmentum Inc. All Rights Reserved.

interpretation can be used to classify organisms;

Unit 12: Mechanisms of Evolution

- **NATURAL SELECTION**
  - BIO.7.c: The student will investigate and understand that populations change through time. Key ideas include natural selection is a mechanism that leads to adaptations and may lead to the emergence of new species; and
- **EVOLUTION OF SPECIES**
  - BIO.7.d: The student will investigate and understand that populations change through time. Key ideas include biological evolution has scientific evidence and explanations.

Unit 13: Classification

- **TAXONOMY**
  - BIO.6.a: The student will investigate and understand that modern classification systems can be used as organizational tools for scientists in the study of organisms. Key ideas include organisms have structural and biochemical similarities and differences;
- **THE SIX KINGDOMS**
  - BIO.4.c: The student will investigate and understand that bacteria and viruses have an effect on living systems. Key ideas include the structures and functions can be compared;
  - BIO.6.c: The student will investigate and understand that modern classification systems can be used as organizational tools for scientists in the study of organisms. Key ideas include developmental stages in different organisms can be used to classify organisms;
  - BIO.6.d: The student will investigate and understand that modern classification systems can be used as organizational tools for scientists in the study of organisms. Key ideas include Archaea, Bacteria, and Eukarya are domains based on characteristics of organisms;
  - BIO.6.e: The student will investigate and understand that modern classification systems can be used as organizational tools for scientists in the study of organisms. Key ideas include the functions and processes of protists, fungi, plants, and animals allow for comparisons and differentiation within the Eukarya kingdoms; and
  - BIO.6.f: The student will investigate and understand that modern classification systems can be used as organizational tools for scientists in the study of organisms. Key ideas include systems of classification are adaptable to new scientific discoveries.

Unit 14: Systems and the Ecology of Succession

- **HOMEOSTASIS AND DYNAMIC EQUILIBRIUM**
  - BIO.8.a: The student will investigate and understand that there are dynamic equilibria within populations, communities, and ecosystems. Key ideas include interactions within and among populations include carrying capacities, limiting factors, and growth curves;
- **SUCCESSION IN COMMUNITIES**

Copyright© Edmentum Inc. All Rights Reserved.

- BIO.8.c: The student will investigate and understand that there are dynamic equilibria within populations, communities, and ecosystems. Key ideas include ecosystems have succession patterns; and

- **NATURAL IMPACTS ON ECOSYSTEMS**

- BIO.8.b: The student will investigate and understand that there are dynamic equilibria within populations, communities, and ecosystems. Key ideas include nutrients cycle with energy flow through ecosystems;
- BIO.8.d: The student will investigate and understand that there are dynamic equilibria within populations, communities, and ecosystems. Key ideas include natural events and human activities influence local and global ecosystems and may affect the flora and fauna of Virginia.

Unit 15: Test-Taking Strategies

- **STUDY HABITS**
- **BEING PREPARED AND GETTING STARTED**
- **WORDING IN TEST QUESTIONS**
- **WORDING IN ANSWER CHOICES**
- **QUESTIONS WITH PASSAGES AND VISUAL DATA**
- **ESSAY AND SHORT ANSWER QUESTIONS**
- **WORD PROBLEMS**

Copyright© Edmentum Inc. All Rights Reserved.