e-Mission:
PANDEM-SIM

21st Century West Virginia Science Standards

https://wvde.state.wv.us/policies/csos.html

Standard: 1—Health Promotion and Disease Prevention Objectives (HE.S.1)

Students in grades 9-12 will comprehend concepts related to health promotion and disease prevention to enhance health.

- HE.HS.1.03 Analyze and interpret ways public health and social policies, along with government regulations (e.g., local, state, federal, world health organizations), influence health promotion and disease prevention.
- HE.HS.1.04 Differentiate between the causes of communicable (e.g., STDs, HIV/AIDS,
- bacterial/viral infections) and noncommunicable (e.g., heredity, lifestyle, environment) diseases.
- HE.HS.1.05 Identify and apply skills to prevent communicable (e.g., STDs, HIV/AIDS, bacterial/viral infections) and noncommunicable (e.g., heredity, lifestyle, environment) diseases.
- HE.HS.1.06 Analyze the impact of genetics and family history on personal health (e.g., DNA, genetic diseases, genetic counseling).
- HE.HS.1.07 Explain how the environment (cultural, community, physical, social, etc.) affects and interacts with growth and development.
- HE.HS.1.08 Identify universal precautions and explain why they are important.
- HE.HS.1.09 Analyze how personal health practices affect the function of body systems in preventing premature death.

Standard 2—Culture, Media, and Technology (HE.S.2)

Students in grades 9-12 will analyze the influence of family, peers, culture, media, technology and other factors on health behaviors.

- HE.HS.2.01 Recognize cultural diversities and their influences on health behaviors (e.g., alcohol, tobacco, and other drugs, life expectancy, risky behaviors).

- HE.HS.2.04 Identify factors in the community that influence health (e.g., schools, religion, traditions, socioeconomic factors, geography, values).

Standard: 5—Decision-Making

Students in grades 9-12 will demonstrate the ability to use decision-making skills to enhance health.

- HE.HS.5.01 Apply a decision-making process for various life situations (e.g., alcohol, tobacco, and other drugs, food choices, weight control, relationships, health care providers, making purchases, education and career options).
- HE.HS.5.02 Identify and discuss health concerns that require collaborative decision-making (e.g., sexuality, STDs, HIV/AIDS transmission/prevention, refusal skills, and others).
- HE.HS.5.03 Analyze the effects of potentially harmful decisions that impact health and the effect these decisions have on family, community and self (alcohol, tobacco, and other drug use, STD transmission, pregnancy prevention, teen parenting, and others).

21st Century Biology Content Standards—Grade 10

Standard: 1—Nature and Application of Science

Students in grade 10 will:

- demonstrate an understanding of history and nature of science as a human endeavor encompassing the contributions of diverse cultures and scientists.
- demonstrate the ability to use the inquiry process to solve problems.
- relate science-technology-societal issues while using a variety of sources to construct and defend their solutions.
- formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.
- draw conclusions from a variety of data sources to analyze and interpret systems and models (e.g., use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles, or predict the influence of external variances such as potential sources of error, or interpret maps).
- investigate, compare and design scientific and technological solutions to address personal and societal problems.
- given current science-technology-societal issues, construct and defend potential solutions.
- relate societal, cultural and economic issues to key scientific innovations.

- synthesize concepts across various science disciplines to better understand the natural world (e.g., form and function, systems, or change over time).

Standard 2—Structure and classification of organisms

Students in grade 10 will:

- investigate and correlate the properties of chemical and biological molecules to their function in biochemical pathways.
- compare and contrast cell types
    - prokaryotic/eukaryotic
    - plant/animal
    - archaea/bacteria
- justify the placement of viruses in classifications systems
- examine the cycle of viruses and compare disease prevention
    - vaccinations
    - vector control
    - drug therapy
- analyze interrelationships of organisms within an ecosystem competition
    - symbiosis
    - commensalism
    - mutualism
    - parasitism

Conceptual Biology—Grade 10

Standard: 1—Nature and Application of Science

Students in grade 10 will:

- demonstrate an understanding of history and nature of science as a human endeavor encompassing the contributions of diverse cultures and scientists.
- demonstrate the ability to use the inquiry process to solve problems.
- relate science-technology-societal issues while using a variety of sources to construct and defend their solutions.
- formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

- conduct and/or design investigations that incorporate the skills and attitudes and/or values of scientific inquiry (e.g., established research protocol, accurate record keeping, replication of results and peer review, objectivity, openness, skepticism, fairness, or creativity and logic).
- design, conduct, evaluate and revise experiments (e.g., compose a question to be investigated, design a controlled investigation that produces numeric data, evaluate the data in the context of scientific laws and principles, construct a conclusion based on findings, propose revisions to investigations based on manipulation of variables and/or analysis of error, or communicate and defend the results and conclusions).
- draw conclusions from a variety of data sources to analyze and interpret systems and models (e.g., use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles, or predict the influence of external variances such as potential sources of error, or interpret maps).
- investigate, compare and design scientific and technological solutions to address personal and societal problems.
- given current science-technology-societal issues, construct and defend potential solutions.
- relate societal, cultural and economic issues to key scientific innovations.

Standard: 2—Content of Science

Students in grade 10 will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives.
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences.
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.
- compare and contrast cell types:
    - prokaryotic/eukaryotic
    - plant/animal

Biology II Content Standards and Objectives—Grade 11

Standard: 1—Nature and Application of Science

Students in grade 11 will:

- demonstrate an understanding of history and nature of science as a human endeavor encompassing the contributions of diverse cultures and scientists.
- demonstrate the ability to use the inquiry process to solve problems.
- relate science-technology-societal issues while using a variety of sources to construct and defend their solutions.
- formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.
- conduct and/or design investigations that incorporate the skills and attitudes and/or values of scientific inquiry (e.g., established research protocol, accurate record keeping, replication of results and peer review, objectivity, openness, skepticism, fairness, or creativity and logic).
- design, conduct, evaluate and revise experiments (e.g., compose a question to be investigated, design a controlled investigation that produces numeric data, evaluate the data in the context of scientific laws and principles, construct a conclusion based on findings, propose revisions to investigations based on manipulation of variables and/or analysis of error, or communicate and defend the results and conclusions).
- draw conclusions from a variety of data sources to analyze and interpret systems and models (e.g., use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles, or predict the influence of external variances such as potential sources of error, or interpret maps).
- investigate, compare and design scientific and technological solutions to address personal and societal problems.
- given current science-technology-societal issues, construct and defend potential solutions.
- relate societal, cultural and economic issues to key scientific innovations.

Standard: 2—Content of Science

Students in grade 11 will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives; demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences.
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.
- distinguish between chromosomal and gene mutations and their potential effects.
- evaluate treatment of viral diseases based on lytic and lysogenic cycles.
- analyze the criteria for classifications of protists:
    - motility
    - cellular structures
    - reproduction
    - energy sources
- survey the fungi kingdom

- characteristics
- reproduction
- relationship to humans and the ecosystem

Human Anatomy and Physiology

Standard 1: Nature and Application of Science

Students will:

- demonstrate an understanding of history and nature of science as a human endeavor encompassing the contribution of diverse cultures and scientists.
- demonstrate the ability to use the inquiry process to solve problems.
- relate science-technology-societal issues while using a variety of sources to construct and defend their solution.
- formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.
- conduct or design investigations that incorporate the skills and attitudes and/or values of scientific inquiry (established research protocol, accurate record keeping, replication of results and peer review, objectivity, openness, skepticism, fairness, or creativity and logic.)
- draw conclusions from a variety of data sources to analyze and interpret systems and models (use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles, or predict the influence of external variances, such as potential sources or error, or interpret maps.)
- investigate, compare, and design scientific and technological solutions to address personal and societal problems.
- given current science-technology-societal issues, construct and defend potential solutions.
- relate societal, cultural and economic issues to key scientific innovations.
- synthesize concepts across various science disciplines to better understand the natural world.

Standard 2: Content of Science

Students will:

- assess the components of the immune system in defending the body.
- research disease causative factors, symptoms, prevention, and treatment.