NORTHERN TIOGA SCHOOL DISTRICT
Building Opportunities

BIOLOGY

Tested Standards/Achors

BIOLOGICAL PRINCIPLES

B1.1: THE NATURE OF SCIENCE

B1.1.1: Understand and apply the scientific method, including forming hypotheses, conducting experiments, collecting and analyzing data, and drawing conclusions.

B1.1.2: Interpret and evaluate scientific information, including understanding the role of theories, models, and empirical evidence in scientific inquiry.

B1.2: CELL STRUCTURE AND FUNCTION

B1.2.1: Describe the structure and function of cell organelles and their role in maintaining homeostasis within the cell.

B1.2.2: Explain cellular processes such as cellular respiration, photosynthesis, and cell division (mitosis and meiosis).

B1.3: GENETICS AND HEREDITY

B1.3.1: Understand the principles of inheritance, including Mendelian genetics, Punnett squares, and genetic variation.

B1.3.2: Explain the structure and function of DNA and RNA, and understand the processes of transcription and translation.

B1.4: EVOLUTION AND DIVERSITY

B1.4.1: Explain the principles of evolution by natural selection and the evidence supporting evolutionary theory.

B1.4.2: Understand the mechanisms of genetic variation and speciation, and analyze the diversity of life on earth.

B1.5: ECOLOGY AND ECOSYSTEMS

B1.5.1: Describe the interactions among organisms and their environments, including energy flow, nutrient cycles, and ecological relationships.

B1.5.2: Analyze how human activities impact ecosystems and biodiversity, and understand the principles of conservation biology.

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SCIENTIFIC PRACTICES

B2.1: DEVELOPING AND USING MODELS

B2.1.1: Create and use models to represent biological systems and processes, including cellular processes and ecological interactions.

B2.1.2: Analyze and interpret models to understand and predict biological phenomena.

B2.2: PLANNING AND CARRYING OUT INVESTIGATIONS

B2.2.1: Design and conduct scientific investigations to test hypotheses and analyze experimental data.

B2.2.2: Use appropriate tools and techniques for data collection and analysis, and ensure accuracy and reliability in experimental procedures.

B2.3: ANALYZING AND INTEPRETING DATA

B2.3.1: Analyze data from experiments and observations, including statistical methods and visual representations (e.g., graphs and charts).

B2.3.2: Interpret data to draw conclusions and make evidence-based claims about biological phenomena.

B2.4: CONSTRUCTING EXPLANATIONS AND DESIGNING SOLUTIONS

B2.4.1: Construct scientific explanations based on evidence and integrate knowledge from various biological concepts.

B2.4.2: Propose solutions to biological problems and design experiments to test these solutions.

B2.5: ENGAGING IN ARGUMENT FROM EVIDENCE

B2.5.1: Construct and defend arguments based on empirical evidence, and evaluate the strength of scientific claims.

B2.5.2: Critically assess and respond to scientific arguments and evidence presented by others.

B2.6: OBTAINING, EVALUATING, AND COMMUNICATING INFORMATION

B2.6.1: Gather and evaluate scientific information from various sources, including research articles and data sets.

B2.6.2: Communicate scientific findings and explanations effectively, using appropriate formats and conventions.