

Campbell County Schools

Biology I

1st Nine Weeks-at-a-Glance

The following skills should be the focus for this Nine Weeks

Ongoing

Embedded Inquiry	<p>CLE 3210.INQ.2 Design and conduct scientific investigations to explore new phenomena, verify previous results, test how well a theory predicts, and compare opposing theories.</p> <ul style="list-style-type: none"> SPI 3210.INQ.2 Analyze the components of a properly designed scientific investigation. <p>CLE 3210.INQ.3 Use appropriate tools and technology to collect precise and accurate data</p> <ul style="list-style-type: none"> SPI 3210.INQ.3 Determine appropriate tools to gather precise and accurate data.
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Standard 3

Energy	<p>CLE 3210.3.1 Analyze energy flow through an ecosystem</p> <ul style="list-style-type: none"> SPI Description SPI 3210.3.1 Interpret a diagram that illustrates energy flow in an ecosystem.
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Standard 2

Interactions	<p>CLE 3210.2.1 Investigate how the dynamic equilibrium of an ecological community is associated with interactions among its organisms.</p> <ul style="list-style-type: none"> SPI 3210.2.1 Predict how population changes of organisms at different trophic levels affect an ecosystem. SPI 3210.2.5 Make inferences about how a specific environmental change can affect the amount of biodiversity.
Changes in Nature	<p>CLE 3210.2.2 Analyze and interpret population data, graphs, or diagrams.</p> <ul style="list-style-type: none"> SPI 3210.2.2 Interpret the relationship between environmental factors and fluctuations in population size. SPI 3210.2.3 Determine how the carrying capacity of an ecosystem is affected by interactions among organisms.
Changes in Nature	<p>CLE 3210.2.3 Predict how global climate change, human activity, geologic events, and the introduction of non-native species impact an ecosystem.</p> <ul style="list-style-type: none"> SPI 3210.2.4 Predict how various types of human activities affect the environment. SPI 3210.2.6 Predict how a specific environmental change may lead to the extinction of a particular species.
Embedded Inquiry	<p>CLE 3210.INQ.2 Design and conduct scientific investigations to explore new phenomena, verify previous results, test how well a theory predicts, and compare opposing theories.</p> <ul style="list-style-type: none"> SPI 3210.INQ.1 Select a description or scenario that reevaluates and/or extends a scientific finding
Interactions	<p>CLE 3210.2.4 Describe the sequence of events associated with biological succession</p> <ul style="list-style-type: none"> SPI 3210.2.7 Analyze factors responsible for the changes associated with biological succession.

Standard 3	
Matter	<p>CLE 3210.3.4 Describe the events which occur during the major biogeochemical cycles.</p> <ul style="list-style-type: none"> • SPI Description SPI 3210.3.4 Predict how changes in a biogeochemical cycle can affect an ecosystem.

Standard 1	
Cell Structure and Function	<p>CLE 3210.1.1 Compare the structure and function of cellular organelles in both prokaryotic and eukaryotic cells.</p> <ul style="list-style-type: none"> • SPI SPI 3210.1.2 Distinguish between prokaryotic and eukaryotic cells • SPI 3210.1.1 Identify the cellular organelles associated with major cell processes. <p>CLE 3210.1.2 Distinguish among the structure and function of the four major organic macromolecules found in living things.</p> <ul style="list-style-type: none"> • SPI 3210.1.3 Distinguish among proteins, carbohydrates, lipids, and nucleic acids. • SPI 3210.1.4 Identify positive tests for carbohydrates, lipids, and proteins • SPI 3210.1.5 Identify how enzymes control chemical reactions in the body
Cell Processes	<p>CLE 3210.1.5 Compare different models to explain the movement of materials into and out of cells.</p> <ul style="list-style-type: none"> • SPI 3210.1.8 Compare and contrast active and passive transport

Standard 3	
Energy	<p>CLE 3210.3.3 Investigate the relationship between the processes of photosynthesis and cellular respiration.</p> <ul style="list-style-type: none"> • SPI 3210.3.3 Compare and contrast photosynthesis and cellular respiration in terms of energy transformation. <p>CLE 3210.3.2 Distinguish between aerobic and anaerobic respiration.</p> <ul style="list-style-type: none"> • SPI 3.2 Distinguish between aerobic and anaerobic respiration.

Standard 1	
Cell Processes	<p>CLE 3210.1.4 Describe the processes of cell growth and reproduction.</p> <ul style="list-style-type: none"> • SPI 3210.1.6 Determine the relationship between cell growth and cell reproduction.

Standard 4	
Reproduction	<p>CLE 3210.4.5 Recognize how meiosis and sexual reproduction contribute to genetic variation in a population</p> <ul style="list-style-type: none"> • SPI SPI 3210.4.6 Describe how meiosis is involved in the production of egg and sperm cells. • SPI 3210.4.7 Describe how meiosis and sexual reproduction contribute to genetic variation in a population.
Heredity Information	<p>CLE 3210.4.1 Investigate how genetic information is encoded in nucleic acids.</p> <ul style="list-style-type: none"> • SPI SPI 3210.4.1 Identify the structure and function of DNA. • SPI 3210.4.3 Recognize the interactions between DNA and RNA during protein synthesis.
Embedded inquiry	<p>CLE 3210.INQ.1 Recognize that science is a progressive endeavor that reevaluates and extends what is already accepted</p> <p>CLE 3210.INQ.1 Trace the historical development of a scientific principle or theory, such as cell theory, evolution, or DNA structure</p>

Embedded Inquiry Checks for Understanding

- ✓ **3210.Inq.1** Trace the historical development of a scientific principle or theory, such as cell theory, evolution, or DNA structure.
- ✓ **3210.Inq.2** Conduct scientific investigations that include testable questions, verifiable hypotheses, and appropriate variables to explore new phenomena or verify the experimental results of others.
- ✓ **3210.Inq.3** Select appropriate tools and technology to collect precise and accurate quantitative and qualitative data.
- ✓ **3210.Inq.4** Determine if data supports or contradicts a hypothesis or conclusion.
- ✓ **3210.Inq.5** Compare or combine experimental evidence from two or more investigations.
- ✓ **3210.Inq.6** Recognize, analyze, and evaluate alternative explanations for the same set of observations.
- ✓ **3210.Inq.7** Analyze experimental results and identify possible sources of experimental error.
- ✓ **3210.Inq.8** Formulate and revise scientific explanations and models using logic and evidence.

Embedded Technology & Engineering Checks for Understanding

- ✓ **93210.T/E.1** Select appropriate tools to conduct a scientific inquiry.
- ✓ **93210.T/E.2** Apply the engineering design process to construct a prototype that meets developmentally appropriate specifications.
- ✓ **93210.T/E.3** Explore how the unintended consequences of new technologies can impact human and non-human communities.
- ✓ **93210.T/E.4** Present research on current bioengineering technologies that advance health and contribute to improvements in our daily lives.
- ✓ **93210.T/E.5** Design a series of multi-view drawings that can be used by other students to construct an adaptive design and test its effectiveness.

Embedded Mathematics Checks for Understanding

- ✓ **3210.Math.1** Choose and construct appropriate graphical representations for a data set.
- ✓ **3210.Math.2** Analyze graphs to interpret biological events.
- ✓ **3210.Math.3** Make decisions about units, scales, and measurement tools that are appropriate for investigations involving measurement.
- ✓ **3210.Math.4** Select and apply an appropriate method to evaluate the reasonableness of results.
- ✓ **3210.Math.5** Apply and interpret rates of change from graphical and numerical data.
- ✓ **3210.Math.6** Apply probabilistic reasoning to solve genetic problems.

Standard 1 – Cells Checks for Understanding

- ✓ **3210.1.1** Investigate cells using a compound microscope.
- ✓ **3210.1.2** Construct a model of a prokaryotic or eukaryotic cell.
- ✓ **3210.1.3** Design a graphic organizer that compares proteins, carbohydrates, lipids, and nucleic acids.
- ✓ **3210.1.4** Conduct tests to detect the presence of proteins, carbohydrates, and lipids.
- ✓ **3210.1.5** Design a model that illustrates enzyme function.
- ✓ **3210.1.6** Demonstrate the movement of chromosomes during mitosis in plant and animal cells.
- ✓ **3210.1.7** Design and conduct an experiment to investigate the effect of various solute concentrations on water movement in cells.
- ✓ **3210.1.8** Analyze experimental data to distinguish between active and passive transport.

Standard 2 – Interdependence Checks for Understanding

- ✓ **3210.2.1** Analyze human population distribution graphs to predict the impact on global resources, society, and the economy.
- ✓ **3210.2.2** Construct and maintain a model of an ecosystem.
- ✓ **3210.2.3** Monitor and evaluate changes in a yeast population.
- ✓ **3210.2.4** Investigate an outdoor habitat to identify the abiotic and biotic factors, plant and animal populations, producers, consumers, and decomposers.
- ✓ **3210.2.5** Conduct research on how human influences have changed an ecosystem and communicate findings through written or oral presentations.
- ✓ **3210.2.6** Describe a sequence of events that illustrates biological succession.

Standard 3 – Flow of Matter and Energy Checks for Understanding

- ✓ **3210.3.1** Track energy flow through an ecosystem.
- ✓ **3210.3.2** Construct a concept map to differentiate between aerobic and anaerobic respiration.
- ✓ **3210.3.3** Conduct experiments to investigate photosynthesis and cellular respiration.
- ✓ **3210.3.4** Investigate the process of fermentation.
- ✓ **3210.3.5** Construct models of the carbon, oxygen, nitrogen, phosphorous, and water cycles.

Standard 4 - Heredity Checks for Understanding

- ✓ **3210.4.1** Use models of DNA, RNA, and amino acids to explain replication and protein synthesis.
- ✓ **3210.4.2** Complete and interpret genetic problems that illustrate sex linkage, co- dominance, incomplete dominance, multiple alleles, and polygenic inheritance.
- ✓ **3210.4.3** Apply data to complete and interpret a genetic pedigree
- ✓ **3210.4.4** Describe how the process of meiosis controls the number of chromosomes in a gamete.
- ✓ **3210.4.5** Associate gene mutation with changes in a DNA molecule.
- ✓ **3210.4.6** Design an informational brochure to describe a human genetic disorder.
- ✓ **3210.4.7** Conduct research to explore the scientific and ethical issues associated with emerging gene technologies.

Standard 5 Biodiversity and Change Checks for Understanding

- ✓ **3210.5.1** Create graphic organizers to demonstrate the relationship between form and function in representative organisms.
- ✓ **3210.5.2** Explain how natural selection operates in the development of a new species.
- ✓ **3210.5.3** Associate fossil data with biological and geological changes in the environment.
- ✓ **3210.5.4** Analyze a variety of models, samples, or diagrams to demonstrate the genetic relatedness of organisms.
- ✓ **3210.5.5** Use a dichotomous key to identify an unknown organism.