

Twelfth Grade Science  
Third Nine Weeks

**Environmental Science**

**Life Sciences**

- B.** Explain how humans are connected to and impact natural systems.
- F.** Explain how human choices today will affect the quality and quantity of life on earth.

**Science and Technology**

- A 1 Explain** how science often advances with the introduction of new technologies and how solving technological problems often results in new scientific knowledge.
- A 2 Describe** how new technologies often extend the current levels of scientific understanding and introduce new areas of research.
- A 3.** Research how scientific inquiry is driven by the desire to understand the natural world and how technological design is driven by the need to meet human needs and solve human problems.
- A 4.** Explain why basic concepts and principles of science and technology should be a part of active debate about the economics, policies, politics and ethics of various science-related and technology -related challenges.

**Science Inquiry**

- A 4.** Create and clarify the method, procedures, controls and variables in complex scientific investigations.

**Scientific Ways of Knowing**

- A 1.** Give examples that show how science is a social endeavor in which scientists share their knowledge with the expectation that it will be challenged continuously by the scientific community and others.
- A 2.** Evaluate scientific investigations by reviewing current scientific knowledge and the experimental procedures used, examining the evidence, identifying faulty reasoning, pointing out statements that go beyond the evidence and suggesting alternative explanations for the same observations.
- A 3.** Select a scientific model, concept or theory and explain how it has been revised over time based on new knowledge, perceptions or technology.
- A 4.** Analyze a set of data to derive a principle and then apply that principle to a similar phenomenon (e.g., predator-prey relationships and properties of semiconductors).
- A 5.** Describe how individuals and teams contribute to science and engineering at different levels of complexity (e.g., an individual may conduct basic field studies, hundreds of people may work together on major scientific questions or technical problem).
- B.** Explain how ethical considerations shape scientific endeavors.
- C 6.** Explain that scientists may develop and apply ethical tests to evaluate the consequences of their research when appropriate.
- C 7.** Describe the current and historical contributions of diverse peoples and cultures to science and technology and the scarcity and inaccessibility of information on some of these contributions.
- C 8.** Recognize that individuals and society must decide on proposals involving new research and the introduction of new technologies into society. Decisions involve assessment of alternatives, risks, costs and benefits and consideration of who benefits and who suffers, who pays and gains, and what the risks are and who bears them.
- C 9.** Recognize the appropriateness and value of basic questions "What can happen?" "What are the odds?" and "How do scientists and engineers know what will happen?"
- C 10.** Recognize that social issues and challenges can affect progress in science and technology (e.g., Funding priorities for specific health problems serve as example of ways that social issues influence science and technology.)
- C 11.** Research how advances in scientific knowledge have impacted society on a local, national or global level.

**Physics**

**Physical Sciences**

- D 8.** Describe how the observed wavelength of a wave depends upon the relative motion of the source and the observer (Doppler effect). If either is moving towards the other; the observed wavelength is shorter; if either is moving away, the observed wavelength is longer (e.g., weather radar, bat echoes and police radar).

**Science and Technology**

- A 1 Explain** how science often advances with the introduction of new technologies and how solving technological problems often results in new scientific knowledge.
- A 2 Describe** how new technologies often extend the current levels of scientific understanding and introduce new areas of research.
- A 3.** Research how scientific inquiry is driven by the desire to understand the natural world and how technological design is driven by the need to meet human needs and solve human problems.
- A 4.** Explain why basic concepts and principles of science and technology should be a part of active debate about the economics, policies, politics and ethics of various science-related and technology -related challenges.

**Science Inquiry**

- A 4.** Create and clarify the method, procedures, controls and variables in complex scientific investigations.

**Scientific Ways of Knowing**

- A 1.** Give examples that show how science is a social endeavor in which scientists share their knowledge with the expectation that it will be challenged continuously by the scientific community and others.
- A 2.** Evaluate scientific investigations by reviewing current scientific knowledge and the experimental procedures used, examining the evidence, identifying faulty reasoning, pointing out statements that go beyond the evidence and suggesting alternative explanations for the same observations.
- A 3.** Select a scientific model, concept or theory and explain how it has been revised over time based on new knowledge, perceptions or technology.
- A 4.** Analyze a set of data to derive a principle and then apply that principle to a similar phenomenon (e.g., predator-prey relationships and properties of semiconductors).
- A 5.** Describe how individuals and teams contribute to science and engineering at different levels of complexity (e.g., an individual may conduct basic field studies, hundreds of people may work together on major scientific questions or technical problem).
- B.** Explain how ethical considerations shape scientific endeavors.
- C 6.** Explain that scientists may develop and apply ethical tests to evaluate the consequences of their research when appropriate.
- C 7.** Describe the current and historical contributions of diverse peoples and cultures to science and technology and the scarcity and inaccessibility of information on some of these contributions.
- C 8.** Recognize that individuals and society must decide on proposals involving new research and the introduction of new technologies into society. Decisions involve assessment of alternatives, risks, costs and benefits and consideration of who benefits and who suffers, who pays and gains, and what the risks are and who bears them.
- C 9.** Recognize the appropriateness and value of basic questions "What can happen?" "What are the odds?" and "How do scientists and engineers know what will happen?"
- C 10.** Recognize that social issues and challenges can affect progress in science and technology (e.g., Funding priorities for specific health problems serve as example of ways that social issues influence science and technology.)
- C 11.** Research how advances in scientific knowledge have impacted society on a local, national or global level.

**Zoology**

**Science and Technology**

- A 1 Explain** how science often advances with the introduction of new technologies and how solving technological problems often results in new scientific knowledge.
- A 2 Describe** how new technologies often extend the current levels of scientific understanding and introduce new areas of research.
- A 3.** Research how scientific inquiry is driven by the desire to understand the natural world and how technological design is driven by the need to meet human needs and solve human problems.
- A 4.** Explain why basic concepts and principles of science and technology should be a part of active debate about the economics, policies, politics and ethics of various science-related and technology -related challenges.

**Science Inquiry**

- A 4.** Create and clarify the method, procedures, controls and variables in complex scientific investigations.

**Life Sciences**

- D 10.** Explain additional components of the evolution theory, including genetic drift, immigration, emigration and mutation.
- E 7.** Relate diversity and adaptation to structures and functions of living organisms at various levels of organization.
- E 8.** Based on the structure and stability of ecosystems and their nonliving components, predict the biotic and abiotic changes in such systems when disturbed (e.g., introduction of non-native species, climatic change, etc.)
- F.** Explain how human choices today will affect the quality and quantity of life on earth.
- G 11.** Trace the historical development of a biological theory or idea (e.g., genetics, cytology and germ theory).

**Zoology Continued**

Twelfth Grade Science  
Third Nine Weeks

**Scientific Ways of Knowing**

- A 1.** Give examples that show how science is a social endeavor in which scientists share their knowledge with the expectation that it will be challenged continuously by the scientific community and others.
- A 2.** Evaluate scientific investigations by reviewing current scientific knowledge and the experimental procedures used, examining the evidence, identifying faulty reasoning, pointing out statements that go beyond the evidence and suggesting alternative explanations for the same observations.
- A 3.** Select a scientific model, concept or theory and explain how it has been revised over time based on new knowledge, perceptions or technology.
- A 4.** Analyze a set of data to derive a principle and then apply that principle to a similar phenomenon (e.g., predator-prey relationships and properties of semiconductors).
- A 5.** Describe how individuals and teams contribute to science and engineering at different levels of complexity (e.g., an individual may conduct basic field studies, hundreds of people may work together on major scientific questions or technical problem).
- C 6.** Explain that scientists may develop and apply ethical tests to evaluate the consequences of their research when appropriate.
- C 7.** Describe the current and historical contributions of diverse peoples and cultures to science and technology and the scarcity and inaccessibility of information on some of these contributions.
- C 8.** Recognize that individuals and society must decide on proposals involving new research and the introduction of new technologies into society. Decisions involve assessment of alternatives, risks, costs and benefits and consideration of who benefits and who suffers, who pays and gains, and what the risks are and who bears them.
- C 9.** Recognize the appropriateness and value of basic questions "What can happen?" "What are the odds?" and "How do scientists and engineers know what will happen?"
- C 10.** Recognize that social issues and challenges can affect progress in science and technology (e.g., Funding priorities for specific health problems serve as example of ways that social issues influence science and technology.)
- C 11.** Research how advances in scientific knowledge have impacted society on a local, national or global level.

**Earth and Space Sciences**

- A 1.** Explain how scientists obtain information about the universe by using technology to detect electromagnetic radiation that is emitted, reflected or absorbed by stars and other objects.

**Physical Sciences**

- A 1.** Explain how atoms join with one another in various combinations in distinct molecules or in repeating crystal patterns.
- C 12.** Describe how different atomic energy levels are associated with the electron configurations of atoms and electron configurations (and/or conformations) of molecules.

**Science and Technology**

- A 1 Explain** how science often advances with the introduction of new technologies and how solving technological problems often results in new scientific knowledge.
- A 2 Describe** how new technologies often extend the current levels of scientific understanding and introduce new areas of research.
- A 3.** Research how scientific inquiry is driven by the desire to understand the natural world and how technological design is driven by the need to meet human needs and solve human problems.
- A 4.** Explain why basic concepts and principles of science and technology should be a part of active debate about the economics, policies, politics and ethics of various science-related and technology-related challenges.

- A 1.** Give examples that show how science is a social endeavor in which scientists share their knowledge with the expectation that it will be challenged continuously by the scientific community and others.
- A 2.** Evaluate scientific investigations by reviewing current scientific knowledge and the experimental procedures used, examining the evidence, identifying faulty reasoning, pointing out statements that go beyond the evidence and suggesting alternative explanations for the same observations.
- A 3.** Select a scientific model, concept or theory and explain how it has been revised over time based on new knowledge, perceptions or technology.
- A 4.** Analyze a set of data to derive a principle and then apply that principle to a similar phenomenon (e.g., predator-prey relationships and properties of semiconductors).
- A 5.** Describe how individuals and teams contribute to science and engineering at different levels of complexity (e.g., an individual may conduct basic field studies, hundreds of people may work together on major scientific questions or technical problem).
- C 6.** Explain that scientists may develop and apply ethical tests to evaluate the consequences of their research when appropriate.
- C 7.** Describe the current and historical contributions of diverse peoples and cultures to science and technology and the scarcity and inaccessibility of information on some of these contributions.
- C 8.** Recognize that individuals and society must decide on proposals involving new research and the introduction of new technologies into society. Decisions involve assessment of alternatives, risks, costs and benefits and consideration of who benefits and who suffers, who pays and gains, and what the risks are and who bears them.
- C 9.** Recognize the appropriateness and value of basic questions "What can happen?" "What are the odds?" and "How do scientists and engineers know what will happen?"
- C 10.** Recognize that social issues and challenges can affect progress in science and technology (e.g., Funding priorities for specific health problems serve as example of ways that social issues influence science and technology.)
- C 11.** Research how advances in scientific knowledge have impacted society on a local, national or global level.

- A 3.** Research and apply appropriate safety precautions when designing and/or conducting scientific investigations (e.g., OSHA<MSDS, eyewash, goggles and ventilation).
- A 4.** Create and clarify the method, procedures, controls and variables in complex scientific investigations