

**Environmental Science**

**Earth and Space Sciences**

**B 10.** Interpret weather maps and their symbols to predict changing weather conditions worldwide (e.g., monsoons, hurricanes and cyclones).

**C 12.** Explain ways in which humans have had a major effect on other species (e.g., the influence of humans on other organisms occurs through land use, which decreases space available to other species and pollution, which changes the chemical composition of air, soil and water)

**C 13.** Explain how human behavior affects the basic processes of natural ecosystems and the quality of the atmosphere, hydrosphere and lithosphere.

**Life Sciences**

**E 6.** Predict some possible impacts on an ecosystem with the introduction of a non-native species.

**E 7.** Show populations can increase through linear or exponential growth with corresponding effects on resource use and environmental pollution.

**E 8.** Recognize that populations can reach or temporarily exceed the carrying capacity of a given environment. Show that the limitation is not just the availability of space but the number of organisms in relation to resources and the capacity of earth systems to support life.

**F 9.** Give examples of how human activity can accelerate rates of natural change and can have unforeseen consequences.

**Science and Technology**

**A 1.** Identify that science and technology are essential social enterprises but alone they can only indicate what can happen, not what should happen. Realize the latter involves human decisions about the use of knowledge.

**A 2.** Predict how decisions regarding the implementation of technologies involve the weighing of trade-offs between predicted positive and negative effects on the environment and and/or humans.

**A 3.** Explore and explain any given technology that may have a different value for different groups of people and at different points in time (e.g., new varieties of farm plants and animals have been engineered by manipulating their genetic instructions to reproduce new characteristics)

**A 5.** Investigate that all fuels (e.g., fossil, solar and nuclear) have advantages and disadvantages; therefore society must consider the trade-offs among them (e.g., economic costs and environmental impact)

**A 6.** Research sources of energy beyond traditional fuels and the advantages, disadvantages and trade-offs society must consider when using alternative sources (e.g., biomass, solar, hybrid engines, wind and fuel cells)

**Scientific Ways of Knowing**

**A 1.** Analyze a set of data to derive a hypothesis and apply that hypothesis to a similar phenomenon (e.g., biome data).

**A 2.** Apply scientific inquiry to evaluate results of scientific investigations, observations, theoretical models and the explanations proposed by other scientists.

**A 3.** Demonstrate that scientific explanations adhere to established criteria, for example a proposed explanation must be logically consistent, it must abide by the rules of evidence and it must be open to questions and modifications.

**A 4.** Explain why scientists can assume that the universe is a vast single system in which the basic rules are the same everywhere.

**A 7.** Explain how theories are judged by how well they fit with other theories, the range of included observations, how well they explain observations and how effective they are in predicting new findings.

**B 5.** Recognize that bias affects outcomes. People tend to ignore evidence that challenges their beliefs but accept evidence that supports their beliefs. Scientists attempt to avoid bias in their work.

**B 6.** Describe the strongly held traditions of science that serve to keep scientists within the bounds of ethical professional behavior.

**C 8.** Explain that the decision to develop a new technology is influenced by societal opinions and demands and by cost benefit considerations.

**C 9.** Explain how natural and human-induced hazards present the need for humans to assess potential danger and risk. Many changes in the environment designed by humans bring benefits to society as well as cause risks.

**C 10.** Describe costs and trade-offs of various hazards – ranging from those with minor risk to a few people, to major catastrophes with major risk to many people. The scale of events and the accuracy with which scientists and engineers can (and cannot) predict events are important considerations.

**C 11.** Research the role of science and technology in careers that students plan to pursue.

**Physics**

**Science and Technology**

**A 1.** Identify that science and technology are essential social enterprises but alone they can only indicate what can happen, not what should happen. Realize the latter involves human decisions about the use of knowledge.

**A 2.** Predict how decisions regarding the implementation of technologies involve the weighing of trade-offs between predicted positive and negative effects on the environment and and/or humans.

**Physical Sciences**

**C 3.** Describe real world examples showing that all energy transformations tend toward disorganized states (e.g., fossil fuel combustion, good pyramids and electrical use.)

**Earth and Space Sciences**

**B 3.** Explain heat and energy transfers in and out of the atmosphere and its involvement in weather and climate (radiation, conduction, convection and advection)

**Scientific Ways of Knowing**

**A 1.** Analyze a set of data to derive a hypothesis and apply that hypothesis to a similar phenomenon (e.g., biome data).

**A 2.** Apply scientific inquiry to evaluate results of scientific investigations, observations, theoretical models and the explanations proposed by other scientists.

**A 3.** Demonstrate that scientific explanations adhere to established criteria, for example a proposed explanation must be logically consistent, it must abide by the rules of evidence and it must be open to questions and modifications.

**A 4.** Explain why scientists can assume that the universe is a vast single system in which the basic rules are the same everywhere.

**A 7.** Explain how theories are judged by how well they fit with other theories, the range of included observations, how well they explain observations and how effective they are in predicting new findings.

**B 5.** Recognize that bias affects outcomes. People tend to ignore evidence that challenges their beliefs but accept evidence that supports their beliefs. Scientists attempt to avoid bias in their work.

**B 6.** Describe the strongly held traditions of science that serve to keep scientists within the bounds of ethical professional behavior.

**C 8.** Explain that the decision to develop a new technology is influenced by societal opinions and demands and by cost benefit considerations.

**C 9.** Explain how natural and human-induced hazards present the need for humans to assess potential danger and risk. Many changes in the environment designed by humans bring benefits to society as well as cause risks.

**C 10.** Describe costs and trade-offs of various hazards – ranging from those with minor risk to a few people, to major catastrophes with major risk to many people. The scale of events and the accuracy with which scientists and engineers can (and cannot) predict events are important considerations.

**C 11.** Research the role of science and technology in careers that students plan to pursue.

**Zoology**

Eleventh Grade Science  
Third Nine Weeks

**Life Sciences**

**B 5.** Investigate the impact on the structure and stability of ecosystems due to changes in their biotic and abiotic components as a result of human activity.

**D 12.** Recognize that ecosystems change when significant climate changes occur or when one or more new species appear as a result of immigration or speciation.

**D 13.** Describe how the process of evolution has changed the physical world over geologic time.

**E 6.** Predict some possible impacts on an ecosystem with the introduction of a non-native species.

**E 10.** Explain how environmental factors can influence heredity or development of organisms.

**J 27.** Describe advances in life sciences that have important long-lasting effects on science and society (e.g., biological evolution, germ theory, biotechnology and discovering germs).

**Science and Technology**

**A 1.** Identify that science and technology are essential social enterprises but alone they can only indicate what can happen, not what should happen. Realize the latter involves human decisions about the use of knowledge.

**A 2.** Predict how decisions regarding the implementation of technologies involve the weighing of trade-offs between predicted positive and negative effects on the environment and and/or humans.

**Scientific Ways of Knowing**

**A 1.** Analyze a set of data to derive a hypothesis and apply that hypothesis to a similar phenomenon (e.g., biome data).

**A 2.** Apply scientific inquiry to evaluate results of scientific investigations, observations, theoretical models and the explanations proposed by other scientists.

**A 3.** Demonstrate that scientific explanations adhere to established criteria, for example a proposed explanation must be logically consistent, it must abide by the rules of evidence and it must be open to questions and modifications.

**A 4.** Explain why scientists can assume that the universe is a vast single system in which the basic rules are the same everywhere.

**A 7.** Explain how theories are judged by how well they fit with other theories, the range of included observations, how well they explain observations and how effective they are in predicting new findings.

**B 5.** Recognize that bias affects outcomes. People tend to ignore evidence that challenges their beliefs but accept evidence that supports their beliefs. Scientists attempt to avoid bias in their work.

**B 6.** Describe the strongly held traditions of science that serve to keep scientists within the bounds of ethical professional behavior.

**C 8.** Explain that the decision to develop a new technology is influenced by societal opinions and demands and by cost benefit considerations.

**C 9.** Explain how natural and human-induced hazards present the need for humans to assess potential danger and risk. Many changes in the environment designed by humans bring benefits to society as well as cause risks.

**C 10.** Describe costs and trade-offs of various hazards – ranging from those with minor risk to a few people, to major catastrophes with major risk to many people. The scale of events and the accuracy with which scientists and engineers can (and cannot) predict events are important considerations.

**C 11.** Research the role of science and technology in careers that students plan to pursue.

**Chemistry**

**Science and Technology**

**A 1.** Identify that science and technology are essential social enterprises but alone they can only indicate what can happen, not what should happen. Realize the latter involves human decisions about the use of knowledge.

**A 2.** Predict how decisions regarding the implementation of technologies involve the weighing of trade-offs between predicted positive and negative effects on the environment and and/or humans.

**Physical Sciences**

**A 1.** Explain that elements with the same number of protons may or may not have the same mass and those with different masses (different numbers of neutrons) are called isotopes. Some of these are radioactive.

**Scientific Ways of Knowing**

**A 1.** Analyze a set of data to derive a hypothesis and apply that hypothesis to a similar phenomenon (e.g., biome data).

**A 2.** Apply scientific inquiry to evaluate results of scientific investigations, observations, theoretical models and the explanations proposed by other scientists.

**A 3.** Demonstrate that scientific explanations adhere to established criteria, for example a proposed explanation must be logically consistent, it must abide by the rules of evidence and it must be open to questions and modifications.

**A 4.** Explain why scientists can assume that the universe is a vast single system in which the basic rules are the same everywhere.

**A 7.** Explain how theories are judged by how well they fit with other theories, the range of included observations, how well they explain observations and how effective they are in predicting new findings.

**B 5.** Recognize that bias affects outcomes. People tend to ignore evidence that challenges their beliefs but accept evidence that supports their beliefs. Scientists attempt to avoid bias in their work.

**B 6.** Describe the strongly held traditions of science that serve to keep scientists within the bounds of ethical professional behavior.

**C 8.** Explain that the decision to develop a new technology is influenced by societal opinions and demands and by cost benefit considerations.

**C 9.** Explain how natural and human-induced hazards present the need for humans to assess potential danger and risk. Many changes in the environment designed by humans bring benefits to society as well as cause risks.

**C 10.** Describe costs and trade-offs of various hazards – ranging from those with minor risk to a few people, to major catastrophes with major risk to many people. The scale of events and the accuracy with which scientists and engineers can (and cannot) predict events are important considerations.

**C 11.** Research the role of science and technology in careers that students plan to pursue.