



Standard #: SC.912.L.17.15

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Discuss the effects of technology on environmental quality.

General Information

Subject Area: Science

Grade: 912

Body of Knowledge: Life Science

Idea: Level 2: Basic Application of Skills & Concepts

Standard: [Interdependence](#) -

Date Adopted or Revised: 02/08

A. The distribution and abundance of organisms is determined by the interactions between organisms, and between organisms and the non-living environment.

B. Energy and nutrients move within and between biotic and abiotic components of ecosystems via physical, chemical and biological processes.

C. Human activities and natural events can have profound effects on populations, biodiversity and ecosystem processes.

Content Complexity Rating: [Level 2: Basic Application of Skills & Concepts](#) - [More Information](#)

Date of Last Rating: 05/08

Status: State Board Approved

Related Courses

| Course Number | Course Title |
|--------------------------|---|
| 2000330: | Biology 2 Honors (Specifically in versions: 2014 - 2015, 2015 - 2018, 2018 - 2022 (current), 2022 and beyond) |
| 3027020: | Biotechnology 2 (Specifically in versions: 2015 and beyond (current)) |
| 2003350: | Chemistry 1 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond) |
| 2001340: | Environmental Science (Specifically in versions: 2015 - 2022 (current), 2022 and beyond) |
| 2002410: | Integrated Science 1 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond) |
| 2002530: | Marine Science 2 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond) |
| 2003400: | Nuclear Radiation (Specifically in versions: 2014 - 2015, 2015 - 2018 (course terminated)) |
| 2020710: | Nuclear Radiation Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond) |
| 2003410: | Physics 2 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond) |
| 2003600: | Principles of Technology 1 (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond) |
| 2003610: | Principles of Technology 2 (Specifically in versions: 2014 - 2015, 2015 - 2018 (course terminated)) |
| 2002540: | Solar Energy Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond) |
| 2002550: | Solar Energy 2 Honors (Specifically in versions: 2014 - 2015, 2015 - 2018 (course terminated)) |
| 2003500: | Renewable Energy 1 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond) |
| 2003838: | Florida's Preinternational Baccalaureate Physics 2 (Specifically in versions: 2015 and beyond (current)) |
| 2001341: | Environmental Science Honors (Specifically in versions: 2016 - 2022 (current), 2022 and beyond) |
| 2001330: | Meteorology Honors (Specifically in versions: 2016 - 2019, 2019 - 2022 (current), 2022 and beyond) |

Related Resources

Lesson Plans

| Name | Description |
|--|--|
| Fighting Poaching with Technology: | In this lesson, students will analyze an informational text from National Geographic that discusses the design of an artificial intelligence technology called PAWS that was designed to prevent poaching. PAWS uses data about previous poaching activities and analyzes the data to create smart and efficient routes for wildlife officers to use while looking for poaching activity. This lesson is designed to support reading in the content area. The lesson plan includes a note-taking guide, text-dependent questions, a writing prompt, answer keys, and a writing rubric. |
| | In this lesson, students will analyze an informational text intended to support reading in the content area. The article informs readers about the ozone layer and why it was larger and lasted longer in 2015 than in previous years. Although it was unusually large, the practices that have been followed since the Montreal Protocol was enacted have |

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|--|--|
| A Hole in the Ozone: | actually resulted in a long-term decrease in the size of the ozone hole. The text explains the aberration and also provides general information about the ozone layer and its function in protecting human life. The lesson plan includes a note-taking guide, text-dependent questions, a writing prompt, answer keys, and a writing rubric. Numerous options to extend the lesson are also included. |
| Impact of Technology on the Environment: | Students conduct research to identify and explore environmental technologies in their area and to describe how these technologies are being used to shape the world around them. |
| Preserving Our Marine Ecosystems: | The focus of this MEA is oil spills and their effect on the environment. In this activity, students from a fictitious class are studying about the effects of an oil spill on marine ecosystems and have performed an experiment in which they were asked to try to rid a teaspoon of corn oil from a baking pan filled with two liters of water as thoroughly as possible in a limited timeframe and with limited resources. By examining, analyzing, and evaluating experimental data related to resource usage, disposal, and labor costs, students must face the tradeoffs that are involved in trying to preserve an ecosystem when time, money, and resources are limited. |

Perspectives Video: Expert

| Name | Description |
|---|---|
| Rapid Genetic Identification of Sharks: | Dr. Mahmood Shivji explains how rapid genetic testing of shark tissue samples is used to address societal pressures on marine environments. Download the CPALMS Perspectives video student note taking guide . |

Perspectives Video: Professional/Enthusiast

| Name | Description |
|---|---|
| Salvaging Timber from Riverbeds : | Coleman Mackie discusses the process of how he salvages pre-cut timbers from the bottom of river beds, the importance of ring density, buoyancy and the uses of the recovered logs. Download the CPALMS Perspectives video student note taking guide . |

Professional Development

| Name | Description |
|--------------------------------|---|
| Volcano Power: | This tutorial is designed to help secondary science teachers learn how to integrate literacy skills within their curriculum. This tutorial focuses on teaching students how to integrate and evaluate multiple sources of information in different media. The focus on literacy across content areas is designed to help students independently build knowledge in different disciplines through reading and writing. |

Text Resources

| Name | Description |
|---|---|
| Rangers Use Artificial Intelligence to Fight Poachers: | This informational text resource is designed to support reading in the content area. The text discusses the design of an artificial intelligence (AI) technology called PAWS that was designed as a tool to help wildlife officials stop poachers. PAWS uses data about previous poaching activities and analyzes the data to create smart and efficient routes for wildlife officers to use while looking for poaching activity. |
| Annual Antarctic Ozone Hole Larger and Formed Later in 2015: | This informational text resource is designed to support reading in the content area. The text provides information about 2015's ozone hole, showing why it is larger this year and lasted longer than previous years. The article shows how the protective ozone layer changes with the seasons and is different each year. Although the hole is large this year, the practices that have been followed since the Montreal Protocol was enacted have allowed the ozone hole to slowly decrease, and it should be back to 1980 levels by 2070. |
| The Importance of Wastewater Treatment : | This informational text resource is intended to support reading in the content area. Wastewater is being dumped into rivers, streams, and oceans, affecting not only the marine environment but also water quality in general. Better treatment processes are needed before this contaminated waste reaches our waterways. The article points out the problems faced by specific countries and their need for better management. |
| Peru Billboard Doubles Up as an Air Purifier: | This informational text resource is intended to support reading in the content area. Students at a university in Peru have erected a billboard near a construction site that filters air. It uses water to rid the air of pollutants like dust, bacteria, and even metal particles. This innovative billboard purifies the same amount of air as 12,000 trees! The billboard uses recycled air and takes little energy to work. The embedded video shows the impact on the construction workers who are near the billboard. |
| Brewing a New Fuel Source: | Mano Misra at the University of Nevada has proposed the use of old coffee grounds to make a biodiesel fuel. The benefits include the reduction of harmful emissions that trap greenhouse gases. Misra suggests ways in which the hurdle of gathering grounds for fuel production can be overcome. |
| Cool Jobs: Planet Protectors: | This informational text resource is intended to support reading in the content area. Scientists are looking into newer, futuristic technologies to help humans do less damage to our environment. This article focuses on three very exciting solutions—leafy walls, water conservation, and solar cells—that are close to becoming realities. |
| Will Seafloor Carpets Be the Key to Harvesting Wave Energy?: | This informational text resource is intended to support reading in the content area. The article describes how scientists have discovered a method of transferring wave energy into electrical energy by the use of manmade seafloor "carpets." After the article explains how the process works, it lists the potential benefits of utilizing this method on a large scale. |
| Risks of Genetic Engineering: Cultured Beef: Do We Really Need a \$380,000 Burger Grown in Petri Dishes?: | An online passage which addresses the Health and Environmental risks of genetic engineering. This informational text resource is intended to support reading in the content area. The text describes the way scientists have created the first lab-grown meat and the possible implications of this new technology. An infographic and video are included that add significantly to the content. |

[Volcano Power Plan Gets US Go-Ahead:](#)

This informational text resource is intended to support reading in the content area. The text describes a group of researchers/investors who are attempting to convert the energy in volcanically heated water to electricity using a new method of forming more fissures to hold the heated water.

[Open-Cycle:](#)

This informational text resource is intended to support reading in the content area. This text describes the open cycle method of converting the energy of warmed, surface seawater into electricity and the benefits of using this method.

Student Resources

Text Resource

| Name | Description |
|---|--|
| Risks of Genetic Engineering: | An online passage which addresses the Health and Environmental risks of genetic engineering. |