



## Ohio Academic Standards Addressed By Zoo Program

### SLIDE SHOW PRESENTATION — EVERGREEN WORLD

Program description:

Learn about the technologies CREW scientists are using in the preservation and propagation of some of the rarest plants on earth. This fascinating program reveals the mysteries of plant tissue culture (“cloning”) and cryopreservation...a frozen garden! Hear and see how science can save plants as well as animals.

Ohio Science Standards addressed by this program, organized by grade band and then standard:

#### GRADES 7-8

**Standard:** Life Sciences

**Benchmark B:** Describe the characteristics of an organism in terms of a combination of inherited traits and recognize reproduction as a characteristic of living organisms essential to the continuation of the species.

**Indicators:**

7<sup>th</sup> Grade

8. Investigate the great diversity among organisms.

**Benchmark C:** Explain how energy entering the ecosystems as sunlight supports the life of organisms through photosynthesis and the transfer of energy through the interactions of organisms and the environment.

**Indicators:**

7<sup>th</sup> Grade

2. Investigate how organisms or populations may interact with one another through symbiotic relationships and how some species have become so adapted to each other that neither could survive without the other (e.g., predator-prey, parasitism, mutualism, and commensalism).

**Benchmark D:** Explain how extinction of a species occurs when the environment changes and its adaptive characteristics are insufficient to allow survival (as seen in evidence of the fossil record).

**Indicators:**

7<sup>th</sup> Grade

5. Explain that some environmental changes occur slowly while others occur rapidly (e.g., forest and pond succession, fires and decomposition).

**Standard:** Science and Technology

**Benchmark A:** Give examples of how technological advances, influenced by scientific knowledge, affect the quality of life.

**Indicator:**

8<sup>th</sup> Grade

1. Examine how science and technology have advanced through the contributions of many different people, cultures and times in history.

**Standard:** Scientific Ways of Knowing

**Benchmark C:** Give examples of how thinking scientifically is helpful in daily life.

**Indicators:**

7<sup>th</sup> Grade

3. Describe how the work of science requires a variety of human abilities and qualities that are helpful in daily life (e.g., reasoning, creativity, skepticism and openness).
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**GRADES 9-10**

**Standard:** Life Science

**Benchmark G:** Describe how human activities can impact the status of natural systems.

**Indicators:**

10<sup>th</sup> Grade

18. Describe ways that human activities can deliberately or inadvertently alter the equilibrium in ecosystems. Explain how changes in technology/biotechnology can cause significant changes, either positive or negative, in environmental quality and carrying capacity.

**Benchmark J:** Summarize the historical development of scientific theories and ideas, and describe emerging issues in the study of life sciences.

**Indicators:**

10<sup>th</sup> Grade

27. Describe advances in life sciences that have important long-lasting effects on sciences (e.g., biological evolution, germ theory, biotechnology and discovering germs).
28. Analyze and investigate emerging scientific issues (e.g., genetically modified food, stem cell research, genetic research and cloning).

**Standard:** Science and Technology

**Benchmark B:** Explain that science and technology are interdependent; each drives the other.

**Indicators:**

9<sup>th</sup> Grade

1. Describe means of comparing the benefits with the risk of technology and how science can inform public policy.

10<sup>th</sup> Grade

2. Describe examples of scientific advances and emerging technologies and how they may impact society.

**Standard:** Scientific Ways of Knowing

**Benchmark A:** Explain that scientific knowledge must be based on evidence, be predictive, logical, subject to modification and limited to the natural world.

**Indicators:**

9<sup>th</sup> Grade

1. Comprehend that many scientific investigations require the contributions of women and men from different disciplines in and out of science. These people study different disciplines in and out of science. These people study different topics, use different techniques and have different

standards of evidence but share a common purpose – to better understand a portion of our universe.

**Benchmark B:** Explain how scientific inquiry is guided by knowledge, observations, ideas and questions.

**Indicators:**

9<sup>th</sup> Grade

7. Recognize that scientific knowledge and explanations have changed over time, almost always building on earlier knowledge.

**Benchmark D:** Recognize that scientific literacy is part of being a knowledgeable citizen.

**Indicators:**

9<sup>th</sup> Grade

9. Investigate how the knowledge, skills and interests learned in science classes apply to the careers students plan to pursue.

10<sup>th</sup> Grade

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## GRADES 11-12

**Standard:** Life Sciences

**Benchmark B:** Explain how humans are connected to and impact natural systems.

**Indicators:**

11<sup>th</sup> Grade

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.

**Benchmark D:** Relate how biotic and abiotic global changes have occurred in the past and will continue to do so in the future.

**Indicators:**

11<sup>th</sup> Grade

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.

**Benchmark E:** Explain the interconnectedness of the components of a natural system.

**Indicators:**

11<sup>th</sup> Grade

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

**Benchmark F:** Explain how human choices today will affect the quality and quantity of life on earth.

**Indicators:**

11<sup>th</sup> Grade

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

11. Investigate issues of environmental quality at local, regional, national and global levels such as population growth, resource use, population distribution, over-consumption, the capacity of technology to solve problems, poverty, the role of economics, politics and different ways humans view the earth.

**Benchmark G:** Summarize the historical development of scientific theories and ideas within the study of life sciences.

**Indicators:**

12<sup>th</sup> Grade

12. Describe advances in life sciences that have important, long-lasting effects on science and society (e.g., biotechnology).

**Standard:** Science and Technology

**Benchmark A:** Predict how human choices today will determine the quality and quantity of life on Earth.

**Indicators:**

12<sup>th</sup> Grade

1. Explain how science often advances with the introduction of new technologies and how solving technological problems often results in new scientific knowledge.

**Standard:** Scientific Ways of Knowing

**Benchmark A:** Explain how scientific evidence is used to develop and revise scientific predictions, ideas or theories.

**Indicators:**

12<sup>th</sup> Grade

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).