

Fairchild Challenge for Middle Schools Challenge Resources 2011-2012

How-to-Guide for Teachers

Challenge 6 – Science Experiments: Plant Biology, Botany and Agriculture

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I. Overview

The science experiment challenge is a way for students to comprehend and experience the scientific method. The scientific process enables scientists to ask questions and draw conclusions about the world, searching for cause and effect relationships in nature. The students use the scientific method to develop a conclusion for their question by performing an experiment. The focus of the experiment should be in the fields of plant biology, botany, and/or agriculture focusing on conservation implications.

II. Approaching the Challenge

Encourage as many **students** as possible to participate in this challenge.

- Schools are encouraged to have students practice researching different topics pertaining to plant biology, botany, and agriculture as practice and to gain more general knowledge on the topics.
 - Students not able to participate in the South Florida Ecosystems workshop are welcomed to research different sites and check out the judges' evaluation sheets in [Challenges-In-Depth](#).
 - Hold a contest at your school to select the best two experiments to submit to The Fairchild Challenge.
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III. Incorporating Science Experiments into your Class

As you plan to participate in this challenge, remember that there are various ways to approach these topics with your students. **The following examples are provided as suggestions** and originality is encouraged. For a detailed list of specific standards that can be incorporated, visit www.fairchildgarden.org/ms/standards.

A. English

- Students are required to have a written component for this challenge which can be graded as an assignment.
- Students can write persuasive essays evaluating current conservation efforts in the respective fields.

B. Science

- Students can work in groups to research soil qualities and compare and contrast those qualities in different ecosystems.
- Students can conduct experiments to explore the effects of different pollutants on the water supply.
- Students can research the benefits and drawbacks of organic farming.

C. History

- Students can research famous botanists and biologists such as David Fairchild.
- Students can track the urban development and agricultural growth in specific areas in South Florida.
- Students can research and explore agricultural practices of Native Americans (i.e. Tequesta), early European/Caribbean settlers, etc.

D. Math

- Students can create graphs that show plant growth.
 - Students can measure and track distribution of South Florida crops.
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VI. Checklist

- Encourage students to look through journals and magazines like *Natural History*, *Popular Mechanics*, *National Geographic*, *Consumer Reports*, or *Science News* to get some ideas about their topic.
 - Choose a specific subject, ask a question, and identify or define a problem. Questioning is probably the most important part of scientific creativity and is often followed by an “if...then” statement. Questioning usually leads to experiments or observations.
 - Make sure experiment display includes your hypothesis, procedure, data, observations, conclusions, and reference sections are included.
 - Experiment addresses conservation implications
 - Review entry requirements before submitting two entries per school.
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V. Resources

Science Buddies

www.sciencebuddies.org/science-fair-projects/project_guide_index.shtml

All Science Fair Projects www.all-science-fair-projects.com

Science Fair Projects World www.sciencefair-projects.org

Science made Simple www.sciencemadesimple.com

Cool Science www.hhmi.org/coolscience

Florida Science Fair Guidelines www.chancellorlantana.com/news/2010-2011%20Science%20Fair%20Handbook.pdf

Science Fair Projects and Experiments www.juliantrubin.com/fairprojects.html