



Fairchild Challenge at Phipps

2019 – 2020 Middle School Challenges In-Depth

Challenge I: Sculpture

“Litter Birds”

For individuals or groups | Maximum points: 200

Due at Phipps: Friday, October 4 by 5 p.m.

Your Challenge: We know littering is bad. Garbage that is not disposed of properly can contaminate our soil and waterways and harm habitat and wildlife! Yet litter continues to grow as an environmental issue. For this challenge, you will draw attention to the problem of litter by creating a set of three to five bird sculptures entirely out of “found objects,” litter* or recycled materials. Along with your set of sculptures, submit one short (no more than three paragraphs) description of how litter/plastics in the environment can affect birds and wildlife.

Each finished sculpture should be no larger than 6”x6”x6” and should weigh no more than three pounds. Sculptures should not contain any food or edible ingredients (including wheat, seeds, or pinecones). Sculptures from this challenge will be featured in Phipps’ 2019 Winter Show. Therefore, each sculpture should have a string, wire or other attachment so that it can be hung on display.

Resources: The following list of online resources may be used when preparing your entry:

- [Lauritzen Garden Exhibit: Metamorphosis](#)
- [Longwood Garden Children’s Christmas Trees](#)
- [Washed Ashore: Art to Save the Seas](#)
- [EPA: Impacts of Mismanaged Trash](#)

Entry Requirements: Deliver to high school program coordinator at Phipps in person or via certified mail (electronic submission is not accepted):

- Challenge Entry Form
- One set of three to five bird sculptures made from “found objects,” litter* or recycled materials
- Each sculpture should have an attached wire or string for hanging and be no larger than 6”x6”x6” and 3 lbs.
- One written description, three paragraphs or less, explaining how litter in the environment affects birds and wildlife.

- Please include the school name and a list of the students involved in the project.

** Use caution when collecting and sculpting with litter, please do not use any materials that are sharp, soiled or otherwise dangerous.*

School Submits: One set of five sculptures, Challenge Entry Form

State Standards:

- 4.1.12.B Research solutions to problems caused by interrupting natural cycles.
- 4.1.12.E Research solutions addressing human impacts on ecosystems over time.
- 4.5.6.A Examine how historical events have shaped the sustainable use of natural resources.
- 4.5.6.D Identify reasons why organisms become threatened, endangered, and extinct.

Keystone Final Assessment:

BIO.B.4.2.4 Describe how ecosystems change in response to natural and human disturbances (e.g., climate changes, introduction of nonnative species, pollution, fires).

Challenge 2: Global Challenge – Field Data Collection

“Shade our Schools – Leaves Are Cool!”

For groups | Maximum Points: 200

Due at Phipps: Friday, November 15 by 5 p.m.

Fairchild Global Challenge: The Fairchild Global Challenge is distributed to the many Fairchild Partner Sites (such as Phipps) by the Fairchild Tropical Botanic Garden (FTBG) in Miami, Florida. Because this challenge is posed to Fairchild Partner Sites around the world, it provides the opportunity for students to have a wider and stronger impact. In this year’s Global Challenge, students from around the world will collect data that will be used by a scientist at the University of Miami.

Your Challenge: In order to understand and predict how plant species are affected by global warming, we need to understand how temperature impacts a plant’s ability to carry out its basic functions. Despite rising ambient temperatures, plants are able to use different characteristics and mechanisms to regulate their leaf temperature. This year, students will help a scientist from the University of Miami conduct a series of experiments to understand how leaf size, shape and color affect leaf temperature. Students will collect data and create an illustrated field journal documenting their observations.

Resources: The following list of online resources may be used when preparing your entry:

- [Types of plants \(video\)](#)

- [Basic Leaf ID Information](#)
- [How to conduct a biodiversity survey](#)
- [ETEKCITY Non-Contact Thermometer](#) (Phipps will have some thermometers available to borrow.)
- [Shade Our Schools Protocol](#), [Shade Our Schools Data Sheets](#)

Entry Requirements: Deliver to high school program coordinator at Phipps in person or via certified mail (electronic submission is not accepted):

- Challenge Entry Form
- Data Requirements:
 - Collect temperature data for leaves of different colors*, different shapes and different sizes as per Shade Our Schools protocol
 - Students must collect temperature measurements for **at least** three leaves per variable
 - Data sheets must be filled out completely (including the “notes” section)
 - Data sheets must include the temperature measurements for the reference
 - Complete data set must be submitted with Field Journal
 - On-time entry submission (late entries may not receive points)
- Field Journal Requirements:
 - Title page of field journal must clearly indicate school name, teacher name(s), and how many students or classes were involved in the collection of data and the creation of the journal
 - Field journal must include a combination of text, labeled drawings, photos and graphs summarizing the results
 - Field journal must include an analysis of the results and conclusions
 - Field journal must be 8.5” x 11” or less, and 12 double sided pages or less, excluding the front and back cover pages. Pages cannot include additional attachments or be used as pockets
 - On time entry submission (late entries may not receive points)

** Leaves that have stopped photosynthesizing and have changed color due to the season change **should not be used** for color comparison. Students can compare leaves that are light and dark green, or other colors as long as they are photosynthesizing and otherwise healthy.*

School submits: Challenge Entry Form, One Field Journal, Data Sheet (Google Sheet provided by FTBG or hardcopy)

State Standards:

- 4.1.6.F
 - Understand how theories are developed.
 - Identify questions that can be answered through scientific investigations and evaluate the appropriateness of questions.
 - Design and conduct a scientific investigation and understand that current scientific knowledge guides scientific investigations.

- Describe relationships using inference and prediction.
- Use appropriate tools and technologies to gather, analyze, and interpret data and understand that it enhances accuracy and allows scientists to analyze and quantify results of investigations.
- Develop descriptions, explanations, and models using evidence and understand that these emphasize evidence, have logically consistent arguments and are based on scientific principles, models, and theories.
- Analyze alternative explanations and understanding that science advances through legitimate skepticism.
- Use mathematics in all aspects of scientific inquiry.
- Understand that scientific investigations may result in new ideas for study, new methods or procedures for an investigation, or new technologies to improve data collection.
- 4.1.12.B Research solutions to problems caused by interrupting natural cycles.
- 4.1.12.E Research solutions addressing human impacts on ecosystems over time.
- CC.3.5.6-8.C Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
- CC.3.5.6-8.D Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
- CC.3.6.6-8.F Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

Keystone Final Assessment:

- BIO.A.4.2 Explain mechanisms that permit organisms to maintain biological balance between their internal and external environments.
 - BIO.B.4.2.4 Describe how ecosystems change in response to natural and human disturbances (e.g., climate changes, introduction of nonnative species, pollution, fires).
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