



**THE
FAIRCHILD
CHALLENGE**

Changing the way we understand and live with nature

at



**2017-2018 School Year
Middle Schools & High Schools**

Coordinator:
Dr. Mark Miller
Outreach Education Manager

Sponsor:





Fairchild Challenge at Franklin Park Conservatory

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CHALLENGES AT A GLANCE: MIDDLE & HIGH SCHOOLS

Fairchild Challenges	Maximum Points	Maximum Number of Entries	Due at Franklin Park Conservatory by 5:00 p.m.
1. Green Cuisine: Healthy Snacks & Comfort Food	400 (400 points per entry)	1	Weds., October 18, 2017 **Cooking takes place on Weds., October 25, 2017**
2. Visual Arts: Petals & Pollinators	300 (100 points per entry)	3 (1 per student/ group)	Weds., Dec. 5, 2017
3. Interview/Writing: Green Treasures: A Living History	900 (300 points per entry)	3 (1 per student/ group)	Weds., February 21, 2018
4. Research/Video: Growing Beyond Earth	500 (500 points per entry)	1	Weds., March 28, 2018

“One touch of nature makes
the whole world kin.”

William Shakespeare

Introduction

Franklin Park Conservatory and Botanical Gardens is a partner in the growing consortium offering a unique program launched in 2002 by The Fairchild Tropical Botanic Garden in Miami, Florida: The Fairchild Challenge. This **free**, multidisciplinary, standards-based, STE(A)M-focused environmental education program provides teachers with a valuable tool to deliver core curriculum, and gives students an opportunity to shine. By appealing to students' innate sense of creativity and curiosity about the world around them, the Challenge invites learners to investigate environmental issues, devise imaginative and effective responses to these issues and to take action—at any level—to address them.

All central Ohio high schools and all central Ohio middle schools are invited to participate in the 2017-2018 Fairchild Challenge! Please contact us for more information and to arrange a meeting at your school. Share with your colleagues, administration and parents, and visit the Franklin Park Conservatory webpage about the Fairchild Challenge program for details, stories and images about this program:

<http://www.fpconservatory.org/The-Experience/Outreach-Programs/The-Fairchild-Challenge>

Consider participating in any one or all of the challenges in this exciting program! Please call Dr. Mark Miller, Fairchild Challenge Coordinator, at [614.715.8030](tel:614.715.8030) or email (mmiller@fpconservatory.org) with any questions you may have, or to arrange a meeting at your school. We look forward to discussing the rich possibilities! Thank you.



Program Guidelines and Procedures

- **Registration:** Schools are required to submit contact information for the teachers who are interested in participating (ideally, at least three teachers from different disciplines).
- **Challenge entry form:** Each registered school (not individual student) must submit one completed entry form by the specified due date for each of the challenges in which they compete. The challenge entry form is at the end of this packet.
- **Student work:** All work submitted as Fairchild Challenge entries must be completed **only by students**. Each entry must be clearly marked with the student(s) and school names. Entries must follow **the specified requirements in this packet**, or they will be penalized and/or disqualified. Participants are expected to follow a strict honor code. All work must be original or from a referenced source. **Plagiarism will result in disqualification of all work submitted by the student(s) involved for the entire program year, and all accumulated points will be nullified.**
- **Deadlines:** Entries must be received by the published deadlines; **due dates are strictly enforced and late entries will be penalized.** Entries will be accepted in person or by mail unless otherwise noted. Entries may be dropped off at Franklin Park Conservatory's entrance during regular hours (seven days a week, from 10am to 5pm, unless otherwise specified). Please label mailed entries "Attn: Dr. Mark Miller, Fairchild Challenge Coordinator." We will gladly accept early-bird entries.
- **Earning Points:** Schools should encourage as many students as possible to attempt each of the diverse challenges. Each challenge has a maximum number of students' entries that may be submitted to the Conservatory for judging; additional entries cannot be accepted. Schools should always try to submit the maximum number of entries allowed per challenge in order to earn as many points as possible.
- **Evaluation Rubrics:** Teachers are encouraged to review each challenge's evaluation rubric prior to submitting student entries. Each challenge evaluation rubric is included in this packet. **Bonus Points:** Occasionally, challenges will present the opportunity to earn bonus points.
- **Judges:** Third-party independent judges use rubrics that reflect the evaluation criteria listed in the specific requirements for each challenge. All the results are final; completed judges' rubrics are not shared although judges' comments can be requested.
- **Scores:** Schools will receive their scores by e-mail following participation in challenges. We do not release other schools' scores or school rankings during the program year. Overall results are announced at the awards celebration. **School recognition:** All schools that participate in The Fairchild Challenge are recognized at the awards celebration.
- **Student Recognition:** Participation certificates for each challenge will be sent to teachers for distribution to all participating students. Top-placing students will be recognized at the Awards Celebration.
- **Global competition:** Top entries from the Global Challenge will be submitted to a larger competition to compete with students internationally. Top submissions will be featured for online voting as part of the Global Challenge. To learn more about this initiative, visit www.fairchildchallenge.org/partners.
- **Student materials:** All entries not claimed by 5pm on May 25, 2018, will become property of Franklin Park Conservatory. Select entries may be used for Fairchild Challenge fundraising or other purposes. **When submitting an entry, you must notify us in writing if you do not agree to these terms.** The Conservatory is not responsible for any materials lost, stolen, or damaged.
- **Schools consent** to Franklin Park Conservatory's **unrestricted use of student work and participants' likenesses**, including photographs and audio/visual recordings made of participants and/or their entries, at the Conservatory or elsewhere. Student entries may be exhibited and/or published by the Conservatory. The Conservatory must be notified in writing of any exceptions or non-consent.

CHALLENGE #1

GREEN CUISINE: HEALTHY SNACKS & COMFORT FOOD

For Individuals or Groups (4 People Maximum); maximum points: 400

YOUR CHALLENGE: There is a growing trend in the US to make our favorite snacks and comfort food with healthier ingredients. The challenge is to choose your favorite snack or comfort food dish, research how to reduce refined sugars, saturated fats, sodium and preservatives, and come up with delicious AND nutritious results. Each dish will be created by student individuals or teams, with an eye to obtaining locally-grown, organically-grown or ethically-sourced produce and ingredients. Cooking demonstration will take place at Franklin Park Conservatory and Botanical Gardens.

ENTRY (RECIPE) SUBMISSION: Wednesday, October 18, 2017

Submit all materials to Franklin Park Conservatory. No electronic submissions:

- Maximum one entry per school
- Drop off or mail recipes and narratives
- Challenge #1 entry form

CONSERVATORY COOK-OFF: Wednesday, October 25, 2017, 5:30-7pm

ENTRY REQUIREMENTS:

- Recipe and healthier ingredients narrative; include a cost estimate for 1 serving/dish
- Recipe must include a list of ingredients and their quantities (in commonly-used measurements), tools needed and specific actions needed to make the dish. Include nutritional information per serving (similar to what one would see on a food label)
- Describe the substitution of unhealthy ingredients for more nutritious ones
- Narrative (150 word minimum; 350 words maximum) must have school and student name(s)
- Minimum cook-off serving size: 8 Servings for tasting
- On-time entry submission

ADDITIONAL INFORMATION:

- Students are encouraged to communicate why certain ingredients were chosen.

EVALUATION CRITERIA: For a detailed list of evaluation criteria and points awarded for this challenge, please review the sample evaluation sheets in this packet.

STATE STANDARDS: Ohio Common Core Strands and Topics that can be addressed while participating in the *Green Cuisine: Healthy Snacks & Comfort Food Challenge*:

- **Language Arts:** *Reading, Writing Standards, Speaking and Listening, Language Standards, Literacy in Science and Technical Subjects*
- **Social Studies:** *Modern World History, Economics & Financial Literacy, Contemporary World Issues*
- **Science:** *Physical Science, Biology, Chemistry*
- **Mathematics:** *Number & Quantity, Functions, Modeling*

RESOURCES:

- Franklin Park Conservatory – <http://www.fpconservatory.org>
- Franklin County Local Food Council - <http://www.fcllocalfoodcouncil.org/>
- Local Matters – <http://www.localmatters.org>
- Food Network - <http://www.foodnetwork.com/recipes.html>
- 50 Healthy Foods - <http://time.com/4121973/the-50-new-healthiest-foods-of-all-time-with-recipes/>



2017-2018

Challenge 1

Green Cuisine: Healthy Snacks

Challenge 1 Recipe/Narrative



Student(s) Name(s):

School:

Name of Dish:

Please submit your recipe on a separate sheet of paper. The narrative (150-word minimum, 350-word maximum) can be written below or submitted on a separate sheet of paper. Be sure to include: description of every ingredient substitution to create a healthier dish, a cost estimate for all ingredients, and mention of where ingredients were sourced. You are encouraged to explain why a particular snack or comfort food dish was chosen.

By 5:00pm, Wednesday, October 18, 2017, complete and return this form, along with other Challenge 1 materials, to Franklin Park Conservatory at 1777 E. Broad Street, Columbus, OH 43203. No electronic submissions accepted. For questions, please contact 614.715.8030.

DIRECTIONS

Please initial in the space to the right and, referring to the guidelines, write your score for each category in the space provided. Write any comments in the space designated.

Fold along the dark lines so that your score is not visible to the other judges.

	Judge 3		Judge 2		Judge 1	
	Initials	Score	Initials	Score	Initials	Score
RECIPE/PRODUCT (100 POINTS)						
<ul style="list-style-type: none"> Ingredients used are primarily locally sourced, fresh, good quality and of high nutritional value Demonstrates understanding of best cooking practices and appropriate food safety techniques Flavorful, cooked properly, seasoned & spiced appropriately; interesting and/or unique taste 		<u>100</u>		<u>100</u>		<u>100</u>
RECIPE/NARRATIVE (100 POINTS)						
<ul style="list-style-type: none"> Produced clear and coherent writing in which development, organization, and style are appropriate to task and purpose Demonstrate command of the conventions of standard English and usage, capitalization, punctuation, and spelling Accurate & clear measurements and cooking instructions 		<u>100</u>		<u>100</u>		<u>100</u>
CRITICAL THINKING (50 POINTS)						
<ul style="list-style-type: none"> Expresses point of view with reasoning and evidence Demonstrates understanding of relationships between concepts Demonstrates ability to combine ingredients into a harmonious, tasty, nutritional dish 		<u>50</u>		<u>50</u>		<u>50</u>
ORIGINALITY (100 POINTS)						
<ul style="list-style-type: none"> Demonstrates their own ideas and experiences creatively and persuasively Shows imagination and ingenuity with cooking in relation to topic Successfully creates healthier snacks & comfort food 		<u>100</u>		<u>100</u>		<u>100</u>
FOR STAFF USE ONLY:						
1. AVERAGE: JUDGES' SCORES FROM SUBTOTALS						
		<u>350</u>		<u>350</u>		<u>350</u>



School Name: _____

Student: _____

REQUIREMENTS	(MAXIMUM 50 PTS)
<input type="checkbox"/> Recipe and narrative (length of 150 min.-350 words max.).....	17 points _____
<input type="checkbox"/> Recipe includes ingredients, quantities, measurements, tools, actions, nutritional info and cost estimate; identify where ingredients were obtained	17 points _____
<input type="checkbox"/> Must be student's own words and own recipe (subject to school plagiarism policies)	9 points _____
<input type="checkbox"/> Include title, school and student(s) name(s).....	5 points _____
<input type="checkbox"/> On-time entry submission.....	2 points _____
Meets Requirements (circle one): Y / N	
Requirements Total:	<div style="border: 1px solid black; width: 60px; height: 30px; display: flex; align-items: center; justify-content: center;"> 50 </div>

FOR STAFF USE ONLY:

1. AVERAGE: JUDGES' SCORES FROM SUBTOTALS _____
2. TOTAL SCORE: ADD REQUIREMENTS TO AVERAGE

~~400~~

GLOBAL CHALLENGE #2 – PETALS & POLLINATORS

For Individuals or Groups; maximum points: 300

The Global Competition is being offered by the Fairchild Challenge, in partnership with all of The Fairchild Challenge Partners. The Top 10 submissions from each individual institution, Franklin Park Conservatory being one, will share their entries and compete in this global challenge.

MEDIA: 3-D MODEL

YOUR CHALLENGE: Over millions of years, flowers have co-evolved specialized traits with various animal pollinators. Perfectly adapted for retrieving nutritious nectar from within blossoms, these animals carry pollen to the next flower, enabling the plant to reproduce. Research the co-evolution of flowers and their pollinators and create a 3D model depicting a fictional flower. Write a description based on your research including what kind of pollinator your flower relies upon and any special adaptations that have co-evolved to facilitate pollination.

ENTRY SUBMISSION: Wednesday, December 5, 2017

Submit all materials to Franklin Park Conservatory. No electronic submissions. To be included:

- (a) Challenge #2 entry form and Challenge #2 table
- (b) Maximum three (3) entries per school (100 points per entry)

ENTRY REQUIREMENTS:

- Model must be 3-D, made entirely of paper and/or cardboard, no larger than 16" in any dimension.
- Descriptive title, students' names, grade and school clearly printed on the back of each entry.
- Complete Challenge #2 table (with name of flower, typed description and bibliography).
- On-time entry submission

ADDITIONAL INFORMATION:

- Challenge #2 requires a completed accompanying Table. Please see Table document for details.
- Students are encouraged to use recycled or reused material to create their 3-D model. Paper products such as newspapers, cereal boxes, shoe boxes, clean paper plates, etc. are all accepted. Please do not use perishable materials for the construction.
- As students create their model, consider how it will be transported and hold up over time.

EVALUATION CRITERIA: For a detailed list of evaluation criteria and points awarded for this challenge, please review the sample evaluation sheets in this packet.

STATE STANDARDS: Ohio Common Core Strands and Topics that can be addressed while participating in the Global Challenge.

- **Visual Arts:** *Perceiving/Knowing, Producing/Performing, Responding/Reflecting*
- **Science:** *Biology, Environmental Science, Life Science, Physical Science & Geology*
- **Language Arts:** *Reading, Writing, Literacy in Science, Research & Media Skills*

RESOURCES:

- Franklin Park Conservatory – <http://www.fpconservatory.org>
- Eden Project - <http://www.edenproject.com/learn/for-everyone/what-is-pollination-a-diagram-for-kids>
- Kids Growing Strong - <https://kidsgrowingstrong.org/pollination/>
- USDA - https://www.fs.fed.us/wildflowers/pollinators/What_is_Pollination/
- Biology Corner - https://www.biologycorner.com/worksheets/flower_coloring.html

2017-2018

Global Challenge

PETALS & POLLINATORS

Challenge 2 Table



Student Name:

School:

Title:

Choose:

3-D Model

Plant Name:

Explain (150-word min; 200-word max) what type of environment your flower inhabits, what kind of pollinator your flower relies upon, and what special adaptations your flower and pollinator have co-evolved to facilitate pollination. Flower must be fictional but include labeled representations of at least 3 scientifically-based flower parts (pistil, stamen, etc.). Include bibliography citing at least 2 sources (MLA or APA format). Please use additional sheets of paper to complete this Table.

By 5:00pm, Wednesday, December 5, 2017, complete and return this form, along with other Challenge 2 materials, to Franklin Park Conservatory at 1777 E. Broad Street, Columbus, OH 43203. No electronic submissions accepted. For questions, please contact Mark Miller 614.715.8030.

DIRECTIONS

Please initial in the space to the right and, referring to the guidelines, write your score for each category in the space provided. Write any comments in the space designated. Fold along the dark lines so that your score is not visible to the other judges.

	Judge 3		Judge 2		Judge 1	
	Initials	Comments	Initials	Comments	Initials	Comments
RESEARCH/KNOWLEDGE OF SCIENCE (20 POINTS)						
<ul style="list-style-type: none"> Breadth and depth of research apparent in facts presented Adequate description of the chosen subject Understanding of theories: support for plant choice(s) 	<u>20</u>		<u>20</u>		<u>20</u>	
ARTISTRY / TECHNICAL ABILITY (20 POINTS)						
<ul style="list-style-type: none"> Competent artistry and use of paper medium Composition of 3-D model Use of artistic elements adds to plant identification 	<u>20</u>		<u>20</u>		<u>20</u>	
RELEVANCE TO THEME (20 POINTS)						
<ul style="list-style-type: none"> Chosen plant and corresponding pollinator are dominant features of model Plant(s) depicted display at least three (3) scientifically-based flower parts (pistil, stamen, etc.) 3-D model adds to viewer's appreciation of nature and the general theme 	<u>20</u>		<u>20</u>		<u>20</u>	
CREATIVITY (20 POINTS)						
<ul style="list-style-type: none"> Depiction of chosen plant and pollinator is memorable 3-D model is aesthetically appealing and unique 	<u>20</u>		<u>20</u>		<u>20</u>	
FOR STAFF USE ONLY:						
1. AVERAGE: JUDGES' SCORES FROM SUBTOTALS						
	SUBTOTAL		SUBTOTAL		SUBTOTAL	
	<u>80</u>		<u>80</u>		<u>80</u>	

School: _____

School Name: _____

Student: _____

REQUIREMENTS	(MAXIMUM 20 PTS)
<input type="checkbox"/> Model is 3-D, made entirely of paper and/or cardboard, no larger than 16" in any dimension.....	5 points _____
<input type="checkbox"/> Artwork caption (150-word minimum, 200-word maximum).....	5 points _____
<input type="checkbox"/> Must be student's own words (subject to school plagiarism policies).....	5 points _____
<input type="checkbox"/> Include title, school and student(s) name(s).....	3 points _____
<input type="checkbox"/> On-time entry submission.....	2 points _____
Meets Requirements (circle one): Y / N	
Requirements Total:	<div style="border: 1px solid black; width: 50px; height: 30px; display: flex; align-items: center; justify-content: center;"> 20 </div>

FOR STAFF USE ONLY:

1. AVERAGE: JUDGES' SCORES FROM SUBTOTALS _____

2. TOTAL SCORE: ADD REQUIREMENTS TO AVERAGE

~~100~~

CHALLENGE #3 GREEN TREASURES: A LIVING HISTORY

For individuals; maximum points: 900

LANGUAGE ARTS: INTERVIEW/WRITING

YOUR CHALLENGE: Ethnobotany is the study of how people use plants for medicinal, culinary, religious, and other purposes. Students will identify and interview three (3) elders in their families, neighborhoods or communities to learn about their past use of plants for medicine, food, religion or culture. Students will then create a human interest story for their local newspaper to represent the information and stories they heard through their intergenerational interviews.

ENTRY SUBMISSION: Wednesday, February 21, 2018

Submit all materials to Franklin Park Conservatory. No electronic submissions:

- (a) Maximum three entries per school (300 points per entry)
- (b) Drop off or mail entries
- (c) Challenge #3 entry form

ENTRY REQUIREMENTS:

- Human Interest Story length: 1,200 (minimum) - 1,500 words (maximum), Word Document
- Must be student's own words (subject to school plagiarism policies)
- Include names and brief background on each of the three (3) people interviewed
- Include title, school, and student's name(s)
- On-time entry submission

ADDITIONAL INFORMATION:

- Students are encouraged to explain how they identified and why they chose their interviewees.

EVALUATION CRITERIA: Research, Interview Techniques and Communication, Writing Skills, Critical Thinking, and Originality. For a detailed list of evaluation criteria and points awarded for this challenge, please review the sample evaluation sheets in this packet.

STATE STANDARDS: Ohio Common Core Strands and Topics that can be addressed while participating in the *Green Treasures: A Living History* Challenge:

- **Language Arts:** *Reading Informational Texts, Writing Standards, Speaking and Listening, Language Standards, Literacy in History/Social Studies, Science, and Technical Subjects*
- **Social Studies:** *American History, Modern World History, Economics and Financial Literacy, Contemporary World Issues, World Geography*
- **Science:** *Environmental Science, Physical Geology, Biology*

RESOURCES:

- Franklin Park Conservatory – <http://www.fpconservatory.org>
- OSU – <http://www.osu.edu> and Ohio Cooperative Extension – <http://extension.osu.edu>
- US Forest Service - <http://www.fs.fed.us/wildflowers/ethnobotany>
- Missouri Botanical Garden - <http://www.missouribotanicalgarden.org/plant-science/plant-science/william-l-brown-center/wlbc-programs/wlbc-ethnobotany.aspx>
- Columbia University - <http://www.columbia.edu/itc/journalism/isaacs/edit/MencherIntv1.html>
- BBC Academy - <http://www.bbc.co.uk/academy/journalism/skills/interviewing>

DIRECTIONS

Please initial in the space to the right and, referring to the guidelines, write your score for each category in the space provided. Write any comments in the space designated.

Fold along the dark lines so that your score is not visible to the other judges.

	Judge 3		Judge 2		Judge 1	
	Initials	Score	Initials	Score	Initials	Score
RESEARCH/INTERVIEW (90 POINTS)		90		90		90
<ul style="list-style-type: none"> Gathered relevant information from at least three (3) credible persons (interviewees) and print or digital sources Demonstrates understanding of subject and appropriate interviewing techniques Uses information from a variety of sources, avoiding an overreliance on any one source 						
WRITING SKILLS (70 POINTS)		70		70		70
<ul style="list-style-type: none"> Produced clear and coherent writing in which development, organization, and style are appropriate to task and purpose Demonstrated command of the conventions of standard English and usage, capitalization, punctuation, and spelling 						
CRITICAL THINKING (70 POINTS)		70		70		70
<ul style="list-style-type: none"> Expressed point of view with reasoning and evidence Demonstrated understanding of relationships between concepts Demonstrated ability to synthesize data and generalize 						
ORIGINALITY (40 POINTS)		40		40		40
<ul style="list-style-type: none"> Expressed their own ideas and experiences creatively and persuasively Showed imagination and ingenuity with writing in relation to topic 						
FOR STAFF USE ONLY: 1. AVERAGE: JUDGES' SCORES FROM SUBTOTALS		270		270		270
	SUBTOTAL	270	SUBTOTAL	270	SUBTOTAL	270



School: _____

School Name: _____

Student: _____

REQUIREMENTS

(MAXIMUM 30 PTS)

- Essay length of 1,200 (minimum) - 1,500 words (maximum); Word Document 7 points _____
- Must be student's own words (subject to school plagiarism policies)..... 9 points _____
- Include names and brief background on each of the three (3) people interviewed 7 points _____
- Include title, school and student(s) name(s)..... 5 points _____
- On-time entry submission 2 points _____

Meets Requirements (circle one): Y / N

Requirements
Total:

30

- FOR STAFF USE ONLY:
1. AVERAGE: JUDGES' SCORES FROM SUBTOTALS _____
 2. TOTAL SCORE: ADD REQUIREMENTS TO AVERAGE

300

CHALLENGE #4 GROWING BEYOND EARTH

For Individuals or Groups; maximum points: 500

Maximum Number of participating schools: 10

(a) Maximum **one entry per school**

CITIZEN SCIENCE/MEDIA ARTS: VIDEO

YOUR CHALLENGE: Over the past two years of the NASA-partnered Growing Beyond Earth (GBE) project, students have tested over 90 varieties of edible plants for germination rates, growth habits and edible biomass production. After confirming that our experimental growth chamber produced similar results to the International Space Station (ISS) Vegetable Production System (Veggie), students helped NASA choose the "cut and come again" procedure to use on the ISS as a method to grow and harvest fresh produce. This year, you will be provided one free GBE Growth Chamber from Fairchild to test how changes in photoperiod affect production of edible biomass in fresh greens varieties. After completing a 30-day trial, analyze your data and create a research poster. Participating students will produce a video documenting their research, data collection, results and creation of the research poster.

PARTICIPATION REQUIREMENTS:

- Schools must submit a Memorandum of Understanding by Wednesday, December 13, 2017 if they plan to participate;
- Participating mentor teachers must attend a mandatory professional development workshop at Franklin Park Conservatory to receive protocols, data sheet access, and materials (below), which will be held on Friday, January 19, 9am-4pm.
- Students must submit data, research poster and video for complete entry submission (see below)

FINAL SUBMISSION ENTRY DUE: Wednesday, March 28, 2018 by 5pm

DATA & VIDEO REQUIREMENTS:

- Data entries updated weekly on provided Google data sheets
- All required data fields complete and valid. Any irregularities or empty fields accompanied by an explanation
- Weekly student-created, scientifically-relevant tweets including the school name, [@GrowBeyondEarth](#), and descriptions of any photographs, illustrations or graphs
- Student-produced Video must be compatible for viewing on all PC or MAC computers and submitted on a flash drive. Video should be 3-minute minimum length and 8-minute maximum length
- On-time entry submission

RESEARCH POSTER REQUIREMENTS:

- Research poster must be 22" x 14"; Research poster must follow MS poster template
- Photographs/illustrations/graphs **must** include captions
- Descriptive title, student's name(s) and school name clearly printed on entry
- Research poster must include visual representation of data, discussion, conclusion and at least 2 references
- On-time entry submission

EVALUATION CRITERIA: For a detailed list of evaluation criteria and points awarded for this challenge, please review the sample evaluation sheets in this packet.

STATE STANDARDS: Ohio Common Core Strands and Topics that can be addressed while participating in the *Growing Beyond Earth* Challenge:

- **Science:** *Earth and Space Science, Life Science, Environmental Science, Physical Science, Biology, Physics, Chemistry*
- **Language Arts:** *Reading Informational Texts, Writing Standards, Speaking and Listening, Language Standards, Literacy in Science and Technical Subjects*
- **Visual Arts:** *Perceiving/Knowing, Producing/Performing, Responding/Reflecting*

CHALLENGE RESOURCES:

- [Welcome letter from NASA](#)
- [HS Research Protocols](#)
- [Data Sheet Instructions](#)
- [What to Tweet](#)
- [GBE Tutorial](#)
- [How to set a timer](#)

ADDITIONAL RESOURCES:

- [Growing Plants In Space](#) NASA presentation
- [Growing Beyond Earth TEDx](#) video & [Space Station Live: Veggie 01](#) video
- [NASA Publications](#)
- [Florikan Fertilizer: Collaboration with NASA](#) presentation
- [Complete GBE seed list](#)
- [2016-2017 Preliminary Results](#)

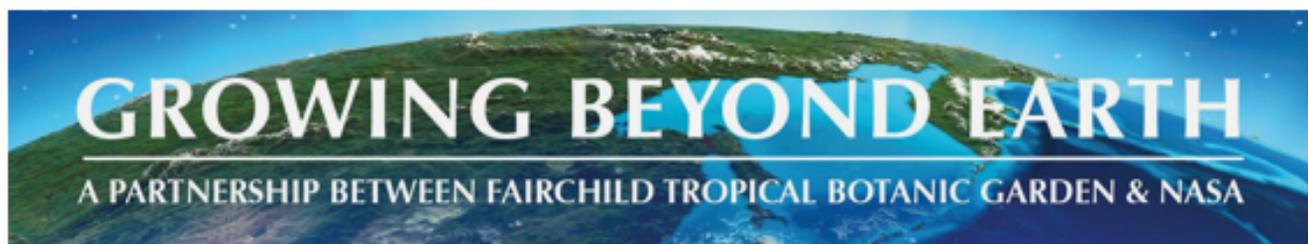
****IF YOU ARE INTERESTED IN BECOMING A PARTICIPATING SCHOOL FOR THIS CHALLENGE, PLEASE COMPLETE THE MEMORANDUM OF UNDERSTANDING (MOU) ON THE FOLLOWING PAGE AND SUBMIT IT TO MARK MILLER BY WEDNESDAY, DECEMBER 13, 2017****

Dr. Mark A. Miller, Fairchild Challenge Coordinator, 614-715-8030; mmiller@fpconservatory.org

Growing Beyond Earth: Required Teacher Workshop

Friday, January 19, 2018; 9am – 4pm at Franklin Park Conservatory and Botanical Gardens

Scientists from NASA have shared information with Fairchild Challenge staff to introduce their research and the problems they try to solve for future space missions. Your classrooms will be used as space-lab extensions and students will contribute to an important step into the future. Participating teachers will learn the research protocols; discuss ideas for suitable experiments and the requested data to select. Teachers will also receive the necessary materials, including basic seed materials, to take back to their schools.



Memorandum of Understanding

As with many of Fairchild's programs, it is our goal to level the playing field by providing all of the materials necessary to achieve the program's goals. In order to make this happen, Fairchild staff spends a tremendous amount of time to raise the funds necessary to make this happen.

For the Growing Beyond Earth Project, we are providing your school with \$350 worth of equipment and supplies. In return, you are required to complete the following:

1. Actively participate in the Fairchild Challenge Growing Beyond Earth Project by:
 - a. Following the research protocols distributed during the January 19, 2018 Teacher Workshop at Franklin Park Conservatory and Botanical Gardens
 - b. Regularly collect and submit the required data
 - c. Produce and submit a final project as per the challenge requirements
2. Maintain all equipment provided by Franklin Park Conservatory's Fairchild Challenge Program
3. Report any equipment breakage or malfunctions to Franklin Park Conservatory as soon as possible
4. Return all equipment to Franklin Park Conservatory upon completion of the Challenge and prior to the end of the 2017-18 academic year (at no cost to you).

If you fail to meet these requirements, Fairchild will request that you return the materials prior to the completion of the project. If you are having difficulties completing any of these items, please contact us as soon as possible so we can provide assistance.

If the project equipment (minus the consumables) is not returned prior to June 7, 2018, Fairchild will charge your school a fee of \$400 (\$350 for the equipment plus an additional \$50 inconvenience fee).

If we do not receive a signed agreement, Fairchild reserves the right refuse materials to your school.

By signing, you are agreeing to the terms and conditions of the Franklin Park Conservatory's Fairchild Challenge Growing Beyond Earth Project.

School Name: _____

Senior Administrator Name

Signature

Date: _____

Email: _____

Lead Teacher Name

Signature

Date: _____

Email: _____

DIRECTIONS

Please initial in the space to the right and, referring to the guidelines, write your score for each category in the space provided. Write any comments in the space designated. Fold along the dark lines so that your score is not visible to the other judges.

	Judge 3		Judge 2		Judge 1	
	Initials	Score	Initials	Score	Initials	Score
SCIENTIFIC RESEARCH (80 POINTS)						
<ul style="list-style-type: none"> Research poster reflects both experimental findings and scientific research Student(s) describe experiment and its significance Conclusion section includes support for further research Sufficient, credible and relevant information presented 		<u>80</u>		<u>80</u>		<u>80</u>
WRITING SKILLS (40 POINTS)						
<ul style="list-style-type: none"> Produced clear and coherent writing in which development, organization, and style are appropriate to task and purpose Demonstrated command of the conventions of standard English and usage, capitalization, punctuation, and spelling 		<u>40</u>		<u>40</u>		<u>40</u>
RESEARCH POSTER (50 POINTS)						
<ul style="list-style-type: none"> Poster clearly explains the following: results (data/observations), discussion, conclusion and references. Results are visually represented and accurately displayed via graph, table or chart Poster is student-authored, easily read and understood, concise and visually appealing 		<u>50</u>		<u>50</u>		<u>50</u>
VIDEO/ORIGINALITY (60 POINTS)						
<ul style="list-style-type: none"> Employed appropriate techniques in Video creation & production Shows imagination and ingenuity in relation to topic 		<u>60</u>		<u>60</u>		<u>60</u>
FOR STAFF USE ONLY:						
AVERAGE: JUDGES' SCORES FROM SUBTOTALS						
		<u>230</u>		<u>230</u>		<u>230</u>
		<u>230</u>		<u>230</u>		<u>230</u>
		<u>230</u>		<u>230</u>		<u>230</u>
		<u>230</u>		<u>230</u>		<u>230</u>



School: _____

School: _____

DATA REQUIREMENTS

(200 POINTS)

- Data entries updated weekly on provided Google data sheets 50 points _____
- All appropriate data fields complete and valid (irregularities or empty fields accompanied by an explanation) 50 points _____
- Weekly student-created, scientifically-relevant tweets including the school name @GrowBeyondEarth, and descriptions of any photographs, illustrations, or graphs 50 points _____
- On time entry submission 50 points _____

Requirements Total:

~~200~~

Meets Requirements (circle one): Y / N

Student: _____

RESEARCH POSTER REQUIREMENTS

(40 POINTS)

- Research poster must be 22 inches by 14 inches 7 points _____
- Photograph/illustration/graph must include caption 5 points _____
- Descriptive title, student's name and school name clearly printed on entry 5 points _____
- Research poster must include visual representation of data, discussion, conclusion, and at least 2 references..... 10 points _____
- Research poster must follow MS GBE poster template 10 points _____
- On time entry submission 2 points _____

Meets Requirements (circle one): Y / N

Requirements
Total:

~~40~~

School Name: _____

Student: _____

VIDEO REQUIREMENTS		(MAXIMUM 30 PTS)
<input type="checkbox"/> Length of Video is no less than 3 minutes and no more than 8 minutes.....		7 points _____
<input type="checkbox"/> Video was submitted on a flash drive and viewable on Mac or PC computers.....		9 points _____
<input type="checkbox"/> Must be students' own work (subject to school plagiarism policies).....		7 points _____
<input type="checkbox"/> Include title, school and student(s) name(s).....		5 points _____
<input type="checkbox"/> On-time entry submission.....		2 points _____
Meets Requirements (circle one): Y / N		
Requirements Total:		<div style="border: 1px solid black; width: 60px; height: 30px; display: flex; align-items: center; justify-content: center;"> 30 </div>

FOR STAFF USE ONLY:

AVERAGE: JUDGES' SCORES FROM SUBTOTALS | _____

1. AVERAGE: REQUIREMENTS SCORES FROM SUBTOTALS _____

2. TOTAL SCORE: ADD REQUIREMENTS TO AVERAGE

~~500~~



Fairchild Challenge at Franklin Park Conservatory 2017 - 2018



ENTRY FORM FOR MIDDLE & HIGH SCHOOLS

This form can be completed by filling out all requested information and submitting by email (preferred), or by printing form and submitting hard-copy (NOTE: Please be sure to print an extra copy for your records).

Challenge Number and Name: _____

School submits (please check off each required item):

Challenge entry form

Maximum entries per school (*please see individual challenge for specific information*)

School: _____

Entry #1 – Name of student: _____ Grade _____

Entry #2 – Name of student: _____ Grade _____

Entry #3 – Name of student: _____ Grade _____

In what class/club was this challenge introduced? (*be specific*): _____

Estimated total number of students at your school who **attempted** this challenge: _____

This challenge was presented to students as (*check all that apply*):

classwork homework extracurricular required assignment optional assignment

Contact Teacher for this Challenge: _____

Discipline(s): _____

Email: _____ Daytime Phone: _____ Ext: _____

Names (first and last) and emails of additional teachers participating in this challenge:

I acknowledge that I have read, understood and abided by all rules and program policies (see program booklet) of *The Fairchild Challenge at Franklin Park Conservatory*.

Teacher's signature _____ Date _____

By 5:00pm of Challenge Deadline, complete and return this entry form to:
Franklin Park Conservatory • 1777 East Broad St. • Columbus, OH 43203



Fairchild Challenge at Franklin Park Conservatory 2017 - 2018



ENTRY FORM FOR MIDDLE & HIGH SCHOOLS

This form can be completed by filling out all requested information and submitting by email (preferred), or by printing form and submitting hard-copy (NOTE: Please be sure to print an extra copy for your records).

Challenge Number and Name: _____

School submits (please check off each required item):

Challenge entry form

Maximum entries per school (*please see individual challenge for specific information*)

School: _____

Entry #1 – Name of student: _____ Grade _____

Entry #2 – Name of student: _____ Grade _____

Entry #3 – Name of student: _____ Grade _____

In what class/club was this challenge introduced? (*be specific*): _____

Estimated total number of students at your school who **attempted** this challenge: _____

This challenge was presented to students as (*check all that apply*):

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Fairchild Challenge at Franklin Park Conservatory 2017 - 2018



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School submits (please check off each required item):

Challenge entry form

Maximum entries per school (*please see individual challenge for specific information*)

School: _____

Entry #1 – Name of student: _____ Grade _____

Entry #2 – Name of student: _____ Grade _____

Entry #3 – Name of student: _____ Grade _____

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Teacher's signature _____ Date _____

By 5:00pm of Challenge Deadline, complete and return this entry form to:
Franklin Park Conservatory • 1777 East Broad St. • Columbus, OH 43203



The Fairchild Challenge 2017-2018 Franklin Park Conservatory



Middle School Registration Form

One registration form is required per middle school. To register for the Fairchild Challenge 2017-2018, please list two teachers from different disciplines to coordinate Fairchild Challenge activities at your school. You must also list an administrator and inform your administration about your school's participation in this year's Fairchild Challenge. After completion, print a copy for your records. Schools will receive an email confirmation within two business days. If no confirmation is received, please mail or fax a copy to the address or fax number below.

Please view our Fairchild Challenge packet for basic information and contact Dr. Mark Miller, 614-715-8030, mmiller@fpconservatory.org, with any questions before submitting your school's registration.

Full name of school: _____

School's street address: _____

City, Zip: _____

Type of school: (Fill in the blank and Check all applicable boxes)

Grade span (ex: 6-8) _____ Public Non-Public

Total enrollment # in all grades designated "Middle School": _____

teacher name	discipline	e-mail	phone & extension
1.			
2.			
3. administrator			

Additional Teachers (please also include discipline, e-mail and phone number)

Yes, I have informed my school's administrative team about our intended participation in the 2017-2018 Fairchild Challenge. Your name: _____

Please print a copy of the completed form for your records and then submit form by email, fax, or US mail.

Franklin Park Conservatory
Attn: Dr. Mark Miller
1777 E. Broad St.
Columbus, OH 43203

E-mail: mmiller@fpconservatory.org Fax: 614-715-8195



The Fairchild Challenge 2017-2018 Franklin Park Conservatory



High School Registration Form

One registration form is required per high school. To register for the Fairchild Challenge 2017-2018, please list two teachers from different disciplines to coordinate Fairchild Challenge activities at your school. You must also list an administrator and inform your administration about your school's participation in this year's Fairchild Challenge. After completion, print a copy for your records. Schools will receive an email confirmation within two business days. If no confirmation is received, please mail or fax a copy to the address or fax number below.

Please view our Fairchild Challenge packet for basic information and contact Dr. Mark Miller, 614-715-8030, mmiller@fpconservatory.org, with any questions before submitting your school's registration.

Full name of school: _____

School's street address: _____

City, Zip: _____

Type of school: (Check all applicable boxes)

9-12

Public

Non-Public

Is your school a Title 1 school? Yes

No

Total enrollment in grades 9-12: _____

teacher name	discipline	e-mail	phone & extension
1.			
2.			
3. administrator			

Additional Teachers (please also include discipline, e-mail and phone number)

Yes, I have informed my school's administrative team about our intended participation in the 2017-2018 Fairchild Challenge. Your name: _____

Please print a copy of the completed form for your records and then submit form by email, fax, or US mail.

Franklin Park Conservatory
Attn: Dr. Mark Miller
1777 E. Broad St.
Columbus, OH 43203

E-mail: mmiller@fpconservatory.org
Fax: 614-715-8195