



The Fairchild Challenge is our award-winning, interdisciplinary, environmental science competition designed to engage students of diverse interests, abilities, talents and backgrounds to explore the natural world. The program has been recognized as a benchmark for exceptional STEM education and for empowering PreK – 12th grade students to become the next generation of scientists, researchers, educated voters, policy makers, and environmentally-minded citizens.

The Fairchild Challenge is made possible by the generous support of the Batchelor Foundation.





Middle School Challenges

Challenge 1: Botanical Breakthrough

Challenge 2: Connect to Protect – My Story

Challenge 3: Growing Beyond Earth

Challenge 4: Green Cuisine – Cooking Show

Challenge 5: Green Treasures – Fairchild's Pharmacy

Challenge 6: Shade Our Schools – Leaves are Cool!



Challenge 1

Botanical Breakthrough

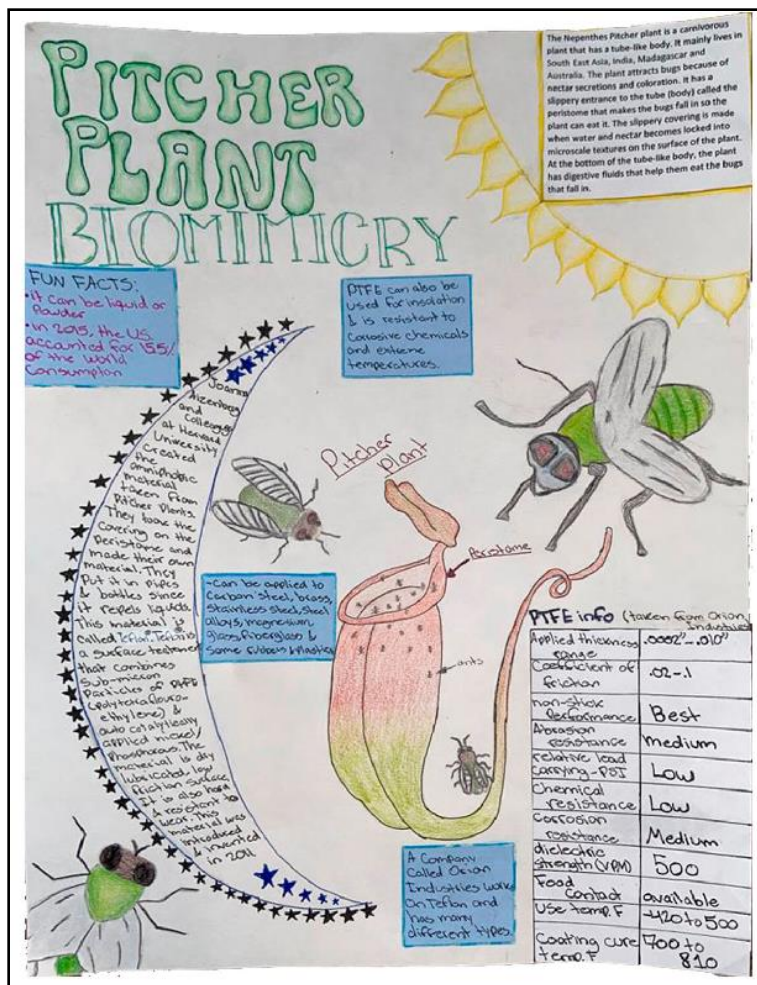
Nature can be regarded as the most profound inventor ever known. **In response to the ever-changing environment, living organisms have evolved and adapted their form and function.** To unlock solutions to modern problems, humans are inspired by, learn from and emulate nature's materials, structures and systems. Research an invention of which the original blueprints were based on plants and their processes. **We asked students to create an infographic explaining how natural design provided the building blocks for some of our most creative engineering feats.**

Challenge 1 Botanical Breakthrough

FIRST PLACE

Carolina Carbone

Aventura Waterways K-8 Center



PITCHER PLANT BIOMIMICRY

The Nepenthes Pitcher plant is a carnivorous plant that has a tube-like body. It mainly lives in South East Asia, India, Madagascar and Australia. The plant attracts bugs because of nectar secretions and coloration. It has a slippery entrance to the tube (body) called the peristome that makes the bugs fall in so the plant can eat it. The slippery covering is made when water and nectar becomes locked into microscale textures on the surface of the plant. At the bottom of the tube-like body, the plant has digestive fluids that help them eat the bugs that fall in.

FUN FACTS:
- It can be liquid or powder
- In 2015, the US accounted for 15% of the world consumption

Arizona State University created the omniphobic material from Pitcher Plants. They took the peristome and made their own material. They put it in pipes & bottles since it repels liquids. This material is called Teflon. Teflon is a surface treatment that combines their carbonaceous particles of PTFE (polytetrafluoroethylene) & graphite. The particles are applied in a way that they move and dry in a curved layer. Friction surface is also made. It is also made in a way that it is resistant to heat. This material has microscale textures & is inert in 2011.

PTFE can also be used for insulation & is resistant to corrosive chemicals and extreme temperatures.

Can be applied to Carbon steel, brass, stainless steel, steel alloys, magnesium, glass, PTFE glass & some other metals.

A Carbon called Orion Industries work on Teflon and has many different types.

PTFE info (taken from Orion Industries)	
Applied thickness	.0002" - .010"
Coefficient of friction	.02-.1
non-stick substance	Best
abrasion resistance	medium
relative load carrying - PSI	Low
Chemical resistance	Low
Corrosion resistance	Medium
dielectric strength (VPM)	500
Food Contact	available
Use temp. F	-120 to 500
Coating cure temp. F	400 to 810

Click image to learn more about this entry.

Challenge 1 Botanical Breakthrough




SECOND PLACE

**Amelia Blanco, Anthony Garcia, Daniela Mendez,
Stephen Nunez, and Jari Obando**

Florida Christian School

Salvinia Molesta's Texture Influences Waterproof Material




History & Facts of the Salvinia Molesta
The Salvinia Molesta is a fascinating plant. It is indigenous to southeastern Brazil and northern Argentina, but is now mostly found in America and Australia. Its hairs are of an egg beater shape, and the tips lightly cling on to the water, reducing friction and helping the plant float.

Problem
Water seeps through the material. This is an issue because, while using the Salvinia Molesta, you need waterproof material to protect something from being damaged. Engineers had to find a way to make this stop, so they can prevent harm to certain structures that are crucial to the economy and society.

Plant Mimicking
While making waterproof material, the engineers based the material off the Salvinia Molesta leaves. The leaves have pockets where the air is confined and the water friction is reduced. The engineers made a plastic version of the leaf's slippery but adhesive layer. The plastic layer was made to have the exact same stickiness as the natural leaf. The material worked precisely as the plant.

Solution
The hairs on the Salvinia Molesta are used to block water which can be used for waterproof material. This can be supported by the fact that each hair is coated in hydrophobic wax crystals. Salvinia Molesta has wax that prevents water from coming in contact with the leaves, then traps air under the plant. This gives the plant buoyancy, which in turn causes the water to not flood the boat.



Click image to learn more about this entry.


Challenge 1 Botanical Breakthrough

Special Merit – Novel Invention Selection

Djesly Mompremier, Reggie Mompremier,
Carlatchee Noelsaint, & Kirsteen Vasquez

John F. Kennedy Middle School

Botanical Breakthrough: Butterworts and Their Sticky Situations!



80 species

Are found mostly in the Northern Hemisphere and South America

"Capturing the Nuisance"

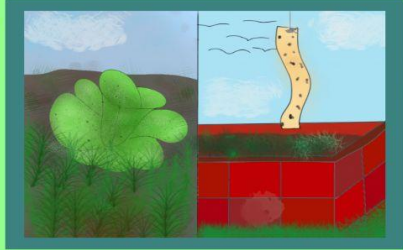
The invention of the sticky fly paper was inspired by the Pinguicula plant. Humans needed to find a solution because flies were a nuisance to them. Through close observations, they noticed how flies were attracted to the plant because of its conspicuous, vibrant colors, and overall look.

Butterworts

are a type of carnivorous plant


Pinguicula

"little greasy one" in reference to their distinctly buttery or greasy feel



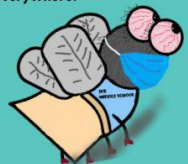
Mexico

has the most variety of species. Dozens are found in the last 20 years




Q & A

What would happen if no one invented the fly trap? There will be swarms of flies everywhere.



Scientific name: Pinguicula
Common name: Butterwort
Higher classification: Lentibulariaceae
Order: Lamiales
Rank: Genus
Kingdom: Plantae



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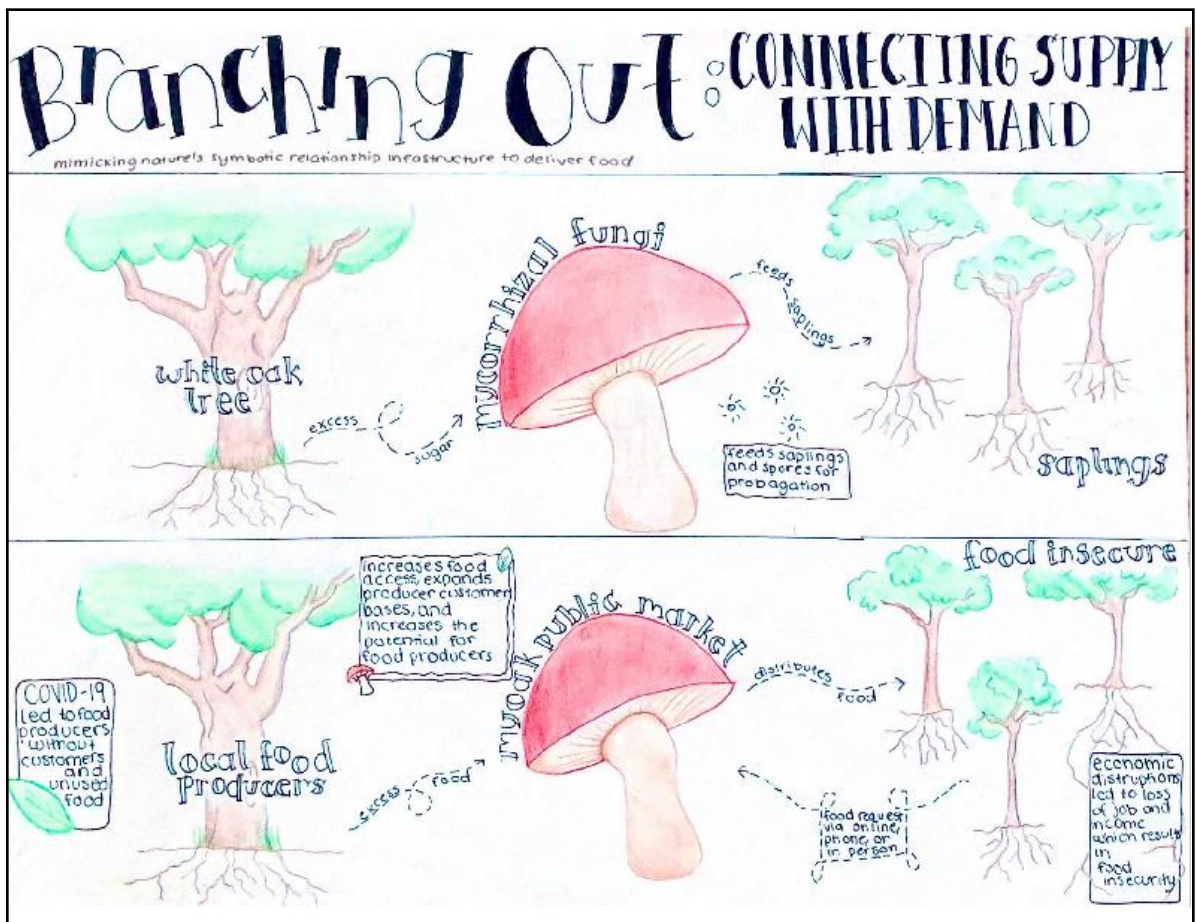
Click image to learn more about this entry.

Challenge 1 Botanical Breakthrough

Special Merit – Artistic Ability

Kathryn Walsh

Nautilus Middle School




[Click image to learn more about this entry.](#)

Challenge 1 Botanical Breakthrough

Special Merit – Unique Plant Selection

Almendra Bodan Nautilus Middle School

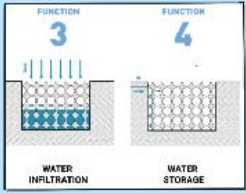


BryoSoil

BryoSoil is a modular, multi functional system that uses five geometries or patterns of bryophytes. The purpose of bryo soil is to prevent flooding and the heat island affect. BryoSoil mimics the grouping directions of the Sphanda moss, Thudium moss, and Campolypus moss.

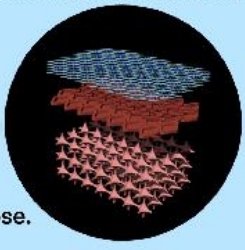
BryoSoil has five functions:

1. Decrease flow rate
2. Redirect
3. Infiltrates
4. Storage
5. Evaporate

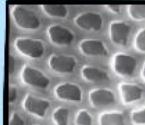



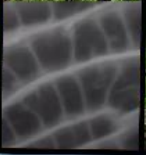



FUNCTION 3: WATER INFILTRATION
FUNCTION 4: WATER STORAGE

BryoSoil is composed of three main parts. Modules under the surface catch and separate run off water. Modules above ground evaporate and cool the air. BryoTiles slow down, conduct, and redirect water.



Each Mosses' geometric pattern serves a purpose.

Sphandae Moss	Thudium Moss	Campolypous moss
		
		

- Sphandae moss decreases flow rate and redirects water.
- Thudium Moss decreases flow rate.
- Campolypous moss evaporates water, cools the air, water infiltration, and has water storage.

Click image to learn more about this entry.

Challenge 1 Botanical Breakthrough



Special Merit – Concise Presentation


Esteban Cruz

Ponce De Leon Middle School

CORN PLASTIC TO THE RESCUE


SIMPLE STEPS WITH HUGE IMPACT

THE PROBLEM




The problem with most plastic is that it just breaks up into tiny pieces and never goes away. Plastic kills many animals, and in some parts of the ocean there's almost as much plastic pieces as sand.

**THE SOLUTION:
BIODEGRADABLE CORN PLASTIC**



To transform corn into plastic, corn kernels are immersed in sulfur dioxide and hot water, where its components break down into starch, protein, and fiber. Biodegradable plastic provides the benefits without the ecological damage.


WHAT CAN IT BE USED FOR.




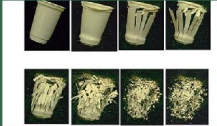
Plastic provides us with medical equipment for computer cases, utensils, and more. Most technology depends on it but we still don't want plastic around forever.

THE INVENTOR: PATRICK GRUBER

LESS POLLUTION, MORE BENEFITS



Many scientists tried to find a renewable and environmentally safe raw material to make into plastic. In 1989, Gruber discovered how to make PLA from plant starches inexpensively enough for large scale production.



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Esteban Cruz, 6th Grade
Ponce De Leon Middle School

Click image to learn more about this entry.



Challenge 2

Connect to Protect Network – My Story

Less than 2% of the pine rocklands remain outside of Everglades National Park making **this natural community one of the most globally imperiled ecosystems**. Much of what remains occurs today exists as only fragmented parcels across Miami and The Keys. **Fairchild's own Connect to Protect Network encourages families, schools and local businesses to plant pine rockland gardens to increase the probability of visits of seed dispersers and pollinators.** The goal of this conservation program is to improve genetic health of plant species by connecting these remaining isolated patches across urban areas. **We asked students to write a short story about their experience in South Florida that features the pine rockland ecosystem.**

Challenge 2
Connect to Protect Network
My Story



FIRST PLACE

Kristian Abreu

Richmond Heights Middle School



Click image to learn more about this entry.

Challenge 2
Connect to Protect Network
My Story



SECOND PLACE

Kristopher Rodriguez

Advanced Achievers Academy



Click image to learn more about this entry.

Challenge 2
Connect to Protect Network
My Story



**Special Merit –
Environmental Advocacy**

Emily Cruz

Advanced Achievers Academy



Click image to learn more about this entry.

Challenge 2
Connect to Protect Network
My Story



Special Merit – Most Imaginative

Carlatchee Noelsaint

John F. Kennedy Middle School



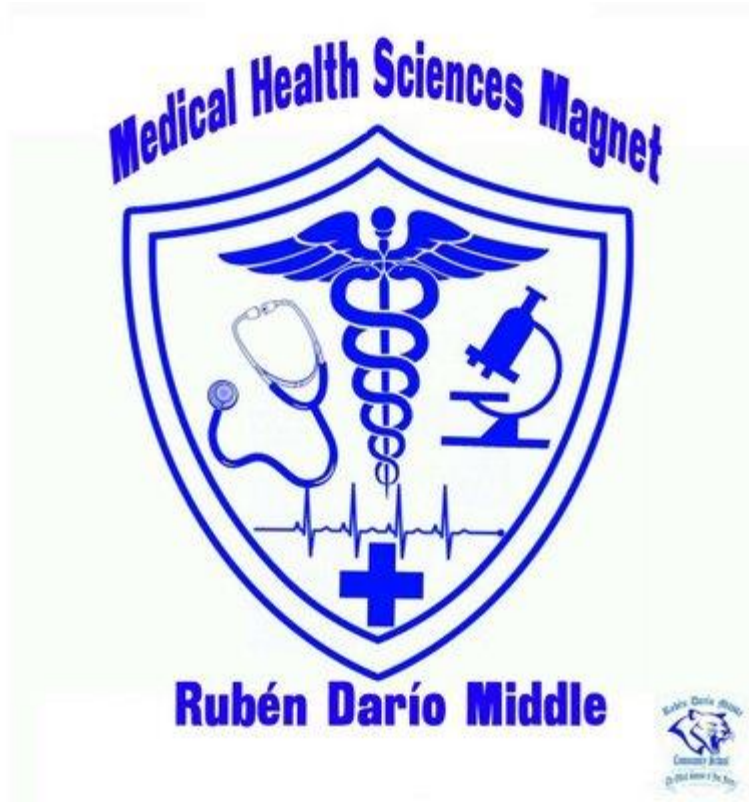
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Challenge 2
Connect to Protect Network
My Story



Special Merit – Educational Content

Patrick Orga
Ruben Dario Middle School



Click image to learn more about this entry.

Challenge 2
Connect to Protect Network
My Story



Special Merit – Most Captivating

Emma Delpozo
Riviera Middle School



Click image to learn more about this entry.

Challenge 2
Connect to Protect Network
My Story



Special Merit – Descriptive Narrative

Elizabeth Adan and Sophia Setien

St. Kevin Catholic School



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Challenge 3

Growing Beyond Earth

Humans have never been more determined to explore the universe, however reaching and settling new planets is still an incredible challenge with several hurdles to overcome. **One of the biggest challenges will be providing fresh produce for astronauts during long distance space travel.** For the past 5 years, your research has brought NASA closer to solving that problem and has supported some of the important components of growing plants in space. This year, **students will test different pollination methods with peppers by growing them at home or in the classroom.**

Challenge 3 Growing Beyond Earth

FIRST PLACE

Mater Lakes Academy Middle School

Pollination Study on Chimayo Peppers

Mater Lakes Academy Middle School

By: Nicole Murphy, Sophia Mendez & Sol Quiroz- Grade 8



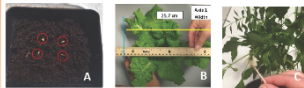
Background Information

Introduction- This particular research is important because we are trying to grow these plants in space so we can then travel to other places in not only our solar system but outside as well. This is important because we can only bring so much food to space but if we can grow our own food successfully in space, it tells us that we will be able to live/travel in space one day.

Summary of Experiments- We grew Chimayo Peppers for a period of 11 weeks but the research will continue for 14 weeks. About half of the students kept them outside and they are pollinated by the wind and bugs. The ones who did it inside would have had to pollinate the plant with a Q-tip or by moving the plant around. We counted how many peppers came from the pollination of the flowers and evaluated the difference between the two settings.

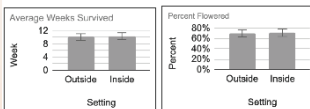
Materials- Growing Media Jiffy peat moss pellets, seeds Envelopes with Capsicum annuum seeds (10 seeds per pack), 4" pots, bag of slow release fertilizer (14-4-14 T180) FLORIKAN, cotton swabs (for pollination of indoor plants).

Methods- We placed the soil pellet in a bowl and covered it with water until it turned into dirt. Afterwards it was mixed in with the fertilizer and placed the 4 seeds in a squared formation or an X (close to the edges but at the same time close the the middle). We assigned spots (inside or outside based on the availability of our homes). Students with outside plants did not pollinate flowers. Students with plants indoors pollinated their flowers with a q-tip. We collected the data including the length, the width, the height, wellness, amount of peppers, temperature(C), humidity, date, sunset, sunrise, amount of water and any additional observations. Students were advised to water their plants when they looked dry. Unfortunately, we are still gathering week 13 and 14 data where we will have the final harvest for the pepper plants.



Picture A shows how to place the seeds, picture B shows how to pollinate the flower and picture C shows how to measure the width. (Pictures taken from the GBE protocol).

Results



Weeks Survived- Both setting survived an average of 10 weeks.

Flowering- Comparison of flowering in the plants.

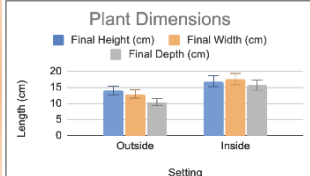


Pepper present- Percentage of peppers present in the plants.

Week the first pepper appeared- Tracks the average week the first pepper appeared.



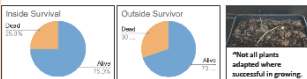
Total peppers- Tracks the average total peppers.



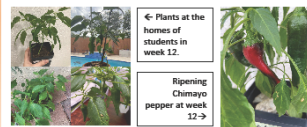
Plant Dimension- Overall plant dimensions (Height, Width and Depth).

Discussion of Results

- Avg. Weeks Survived-** The inside plants survived 10.4 while the outside survived 10.1 (very close).
- Percent Flowered-** The inside plant flowered 71% while the outside plants flowered 70%.
- Percent of Peppers Present-** 50% outside plants fruited peppers, while 43% inside plants fruited peppers.
- Week first pepper appeared-** In Week seven most of the outside peppers started appearing and in week 8.3 the inside peppers started appearing.
- Total Peppers-** Outside plants gave an average of 2.8 peppers, 3.8 peppers for the inside.
- Final Height-** The outside plants were 14 cm while the inside were 16.9 cm
- Final Width-** The outside plants were 13 cm and the inside plants were 17.6 cm.
- Final Depth-** The outside depth of the plant was 10.5 cm and the depth for the inside plant is 15.7 cm.
- Survivorship-** 70% of outside plants survived, while 75% of inside plants survived.



- **The weeks of pepper only seem to vary by one week (which can be due to chance).
- **The amount of peppers produced only differed by one pepper from the outside vs. inside setting (can also be by chance).
- **There is no large variation of observations between pepper plants kept outside vs. inside. They both seem to be able to succeed.



Conclusions

The results state that the peppers flowered at almost the same rate and that they survived for almost the same amount of time. This shows that the health of the plants remained relatively the same in both settings. However, the plant grew more peppers outside than inside. This could be due to the fact that there is better pollination in an outside environment or this could be simply due to the distribution of energy within the plant. Because if you notice, the inside plants grew longer while the outside plants grew more peppers. The things to note about this experiment is that the peppers are more prone to diseases and pests when they are grown outside and when the peppers are grown inside, you have to make sure that they are getting enough water and that they are being pollinated.

These results are significant because they show that the chimayo pepper plants could survive just as well inside as they can outside. This raises the possibility of taking them up to space and possibly "Growing Beyond the Earth".

However, before we could grow them in space, we have to test multiple trials of these Chimayo pepper plants species with conditions similar to space. We should try growing them in the modified pods, with the grow lights and circulation fans. This experiment could indicate if the plant is convenient/reliable enough to be grown in the international space station.

References

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Click image to learn more about this entry.

Challenge 3 Growing Beyond Earth



SECOND PLACE

Carrollton School of the Sacred Heart

Carrollton Junior High Chili Challenges Grade Seven Science



Background Information



Fairchild Challenge schools in the Growing Beyond Earth (GBE) program have many different growing conditions (temperature, humidity, elevation) which helps NASA's Project Veggie to select the toughest plants to grow for the astronauts. The Capsicum annuum "Fidel Martinez Chimayo" pepper was chosen this year and scientists are interested in how these chili peppers react to artificial pollination and how growing the plants inside and outside aids in the production of chilis.

Chilis are the first fruit to be grown in space. Chilis self pollinate with air movement, either by wind or an insect vibrating its wings. The challenge on the ISS is that with microgravity there is no air movement and there are no insect pollinators. We are helping to test the Independent Variable of artificial pollination. On certain chilis in the class, a cotton swab is rubbed in the center of the flower causing the pollen from the anther to enter the stigma which transports pollen to the ovule in the ovary. The other Independent Variable we are testing is to see the number of chilis "fruit" grown on plants growing indoors or outdoors in South Florida.

Growing plants in space offers nutritional, psychological and physical benefits. Astronauts rely on packaged food. Over time, its nutritional value decreases, losing many vitamins and minerals. Chilis provide Vitamins A, C, B6 and K1, Potassium and Copper which helps to maintain bone strength along with other benefits. All plants produce oxygen and release water vapor. So, chilis add flavor and life into the Space Station. Even a little plant can alter the mood of a homesick astronaut.

Methods and Materials - Steps to Planting Our Chili Peppers

- Place a coconut jiffy pellets into a 4" pot. Put the pot into another dish like a pie pan and pour 300 ml water into the pan and let it sit for a few minutes. After the water is fully absorbed by the pellet, break the moistened pellet into bits. Mix the premeasured packet of fertilizer beads into the pellet. Plant four Capsicum annuum seeds in the middle of the pot about 1 cm apart in a square. Remove other germinated seeds so only one chili seedling remains in the pot.

Data Collection Process

- Every class record the date, day number, temperature in Celsius, and the humidity percentage in notebooks. Water plants as needed with around 50 ml of water. Finally, at the end of each week, measure the plants' height, width, length, and record, indications also the overall health into a shared Google Sheet. Also insert the average of the abiotic factors we recorded daily.

Results



Independent Variable #1

How did chili plants grown inside the classroom compare to those grown outside?

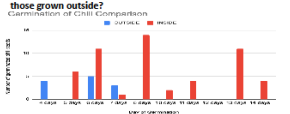


Figure 1: Germination Comparison of Outdoor and Indoor Conditions
The outdoor plants began germination a day before those inside did. All outdoor plants had germinated by Day 7 whereas the inside plants took longer but all germinated by Day 14. There were more 18 indoor plants and 7 outside plants for this experiment.

Height of Chili Plants

The outside chili plants grew higher than chilis grown inside. As our graph shows, we had very few chili plants survive until Week 14. The highest chili outside grew to 23 cm and the only inside chili plant at Week 14 was 18 cm high. The average heights of outdoor and indoor chili heights was almost the same.



Figure 2: Week 8 Indoor and Outdoor Chilis, Dec 4, 2020 (K. Thome)

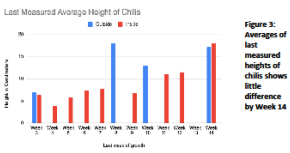


Figure 3: Averages of last measured heights of chilis shows little difference by Week 14

Discussion of Results



Independent Variable #2

What is the effect of artificial pollination on chili production?

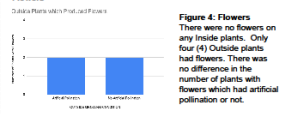


Figure 4: Flowers
There were no flowers on any indoor plants. Only four (4) outdoor plants had flowers. There was no difference in the number of plants with flowers which had artificial pollination or not.

Chili Production

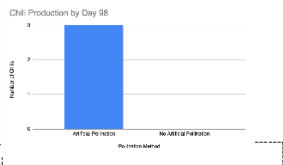
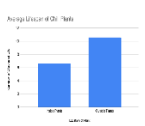


Figure 5: Chili Production
Only two plants produced chilis by Day 98, both plants were grown outside and had artificial pollination, with such a low percentage of chilis, we cannot make a conclusion about the effect of artificial pollination.

Figure 6: Lifespan comparison of our chili plants

Outdoor chili plants had a greater survival rate. On Harvest Day (Day 98) there were four (4) outdoor plants alive and one (1) indoor plant alive.



Conclusion

Discussion and Analysis of Results
Growing the chili plants outside is more beneficial than growing them indoors. The outdoor growth conditions resulted in faster germination, taller growth, greater production of flowers and chilis, and a longer lifespan of the plants. We appreciate the chance to see these results.

Our indoor plants were heavily impacted by mold with 94% inside plants having mold but no outside plants had mold. The humidity inside the classroom averaged 71% compared with 73% outside humidity. Due to COVID, the classroom door to the outside was opened all day. There was less airflow inside than outside which may be why we had mold. Indoor humidity was similar to the outside during the first weeks up to Week 6. This was when most of our indoor plants died, although we scraped off the mold from the surface, the plant stems weakened and the plants fell over. Fans in the classroom would have helped greatly or keeping the doors closed (which we do now). The jiffy pellets absorbed and held more water than usual potting soil, and we may have over watered the plants which also added to the mold. Also, the natural light in the room was not enough and we moved them to another room. Installing artificial lights would have helped.

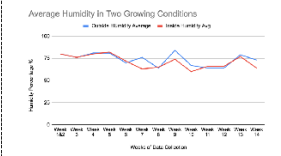


Figure 7: Average Humidity inside and outside
Due to the loss of so many plants to mold, there was a small number of plants which produced flowers for us to do the artificial pollination test. We do not have enough data to make a conclusion. There were only four plants outdoors which produced flowers. With only two plants producing chilis, we have limited results and cannot make any conclusions although both were artificially pollinated. Further testing, with better growing conditions, may show more clear results.

This was a valuable learning experience in growing a plant over a long period of time, and the chance to help contribute to research for chilis for the astronauts. We will continue to grow our chilis until ripe and look forward to tasting them. With chilis' health benefits and the fun of a spicy meal we hope they will grow successfully in space.

References:


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Challenge 3 Growing Beyond Earth

Special Merit – Clear and Concise Presentation

Air Base K-8 Center



The Effect of Artificial Pollination on Number of Fidel Martinez Chimayo Peppers Produced

Stephanie Barradas, Claire Remmen, and Alexa Torrens
Air Base K-8 Center for International Education

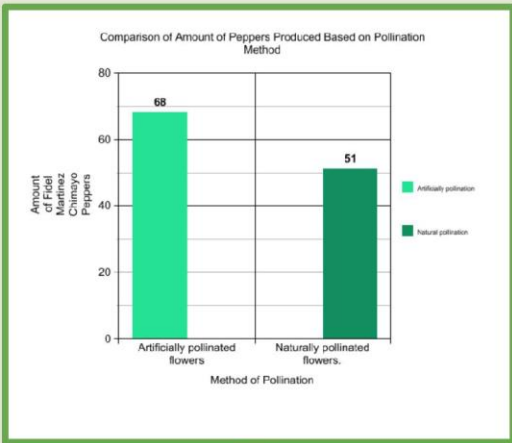
Introduction

In hopes to expand on knowledge of the universe, human beings have been making a continuous effort to learn more about outer space. Though, doing this is quite impossible if you don't even have the proper nutrients to thrive. With this experiment, students are able to help gather information that could contribute to NASA's studies by testing different pollination methods on peppers. With that being said, can the yield of peppers be affected by experimenting with different pollination conditions?


Methods/Materials

Materials: Moss pellets, 'Fidel Martinez Chimayo' (*Capsicum annuum*) seeds, cotton swabs, and fertilizer.

Methods: Four seeds were planted with each pot (best plant would later be prioritized). A selection of pots were artificially pollinated, while the remaining pots were left to be naturally pollinated.



Method of Pollination	Amount of Fidel Martinez Chimayo Peppers
Artificially pollinated flowers	68
Naturally pollinated flowers	51



Pictures of young pepper plants

Results

Pepper flowers that were artificially pollinated sprouted 68 peppers, while only 51 naturally pollinated flowers sprouted peppers. Flowers that were planted artificially yielded more peppers than the flowers that were naturally pollinated.

Conclusion

In this experiment students tested whether the plants being naturally or artificially pollinated affected the production of peppers. This experiment was done over a 12 week period. Within this time slot, enough evidence was gathered to establish a trend amongst the outcomes of each plant. Relationship wise, it is clear that the peppers thrived more with artificial pollination. The reason behind this was because with artificial pollination the flower has a much more significant chance of gathering and using pollen. This experiment is a great basis for astronauts as they are low maintenance and very resilient.

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"2020 GBE Protocols_REVISED 09-29.Pdf" Google Drive, Google, drive.google.com/file/d/1Gj1-hjPaNMEs1Az1zT9n-Ozmkorf8IC/view.

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Challenge 4

Green Cuisine – Cooking Show

Food brings comfort during these unprecedented times when people maintain social distancing and stay at home. **To reduce shopping trips people turn to their pantries for convenience, nutrition and delicious meals.** Staples such as rice, pasta and beans to shelf-stable condiments like vinegar, soy sauce and hot sauce can be found in the cupboard. **We asked students to create a cooking video showcasing imaginative recipes from the cupboard.**

Challenge 4
Green Cuisine
Cooking Show



FIRST PLACE

Pam Fuentes and Anna Fuentes
Vineland K-8 Center



Click image to learn more about this entry.

Challenge 4
Green Cuisine
Cooking Show



SECOND PLACE

Emily Galindo and Nestor Gandul
Rockway Middle School

THE "Junior Ball"
With Emily Galindo &
Nestor Gandul
For Green Cuisine Challenge 4
Rockway Middle School 2020-2021

Click image to learn more about this entry.

Challenge 4
Green Cuisine
Cooking Show



Special Merit – Best Use of Graphics

Ana Garcia

Dorothy M. Wallace COPE Center

Ana Garcia
Dorothy M. Wallace C.O.P.E. Center South

Family and Consumer Sciences
Nuris Binett, Teacher



Click image to learn more about this entry.

Challenge 4
Green Cuisine
Cooking Show



**Special Merit –
Ingenious Use of Pantry Ingredients**

**Sofia Crespo, Selene Lettieres,
Adel Adly, and Miranda Silva**

Mater Grove Academy



Click image to learn more about this entry.

Challenge 4
Green Cuisine
Cooking Show



Special Merit – Most Dynamic

**Vivian Cordova, Alexa Diez-Arguelles,
and Danica Argote**

St. Kevin Catholic School

2020-2021
Challenge 4
St. Kevin

**By: Vivian Cordova,
Alexa Diez-Arguelles,
and Danica Argote**

Click image to learn more about this entry.



Challenge 5

Green Treasures – Fairchild's Pharmacy

Throughout the course of history people from all over the world have turned to specific plants for their healing properties many of which have been incorporated into contemporary medicine. **To date, nearly 18,000 plant species have documented medicinal uses several of which are on display at Fairchild.** These plants are not only beautiful to look at but are traditionally used to create natural remedies for the treatment of many common ailments. **Students were asked to research three of the plants on the provided list below and create a podcast describing the medicinal uses of each plant found in Fairchild's living collection.**

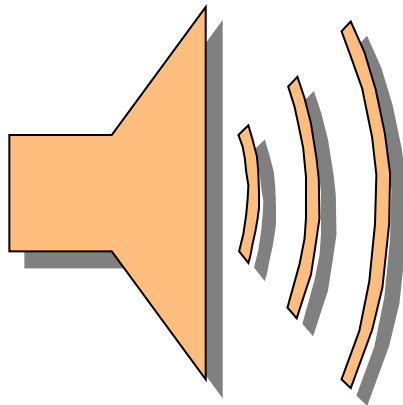
Challenge 5
Green Treasures
Fairchild's Pharmacy



FIRST PLACE

**Jan Carlos Hernandez, Dominic Hernandez,
Bryan Backs, and Carlos De Armas**

Hialeah Gardens Middle School



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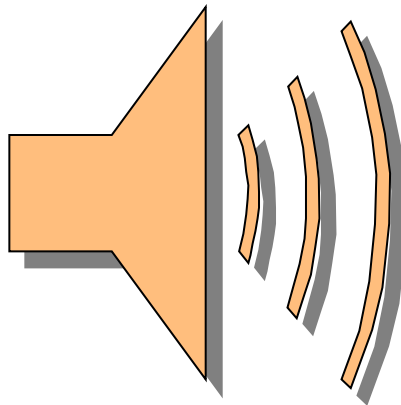
Challenge 5
Green Treasures
Fairchild's Pharmacy



SECOND PLACE

**Sophia Setien, Elizabeth Adan,
and Sabrina Pernas**

St. Kevin Catholic School



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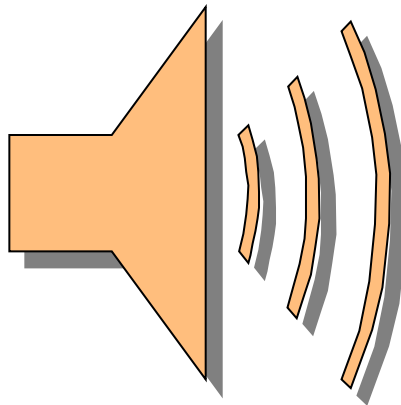
Challenge 5
Green Treasures
Fairchild's Pharmacy



Special Merit – Unique Plant Selection

**Sasha Mendez, Anthony Gonzalez,
Edier Hernandez, Analia Alvarez,
Marc Dorcin, Helen Ramos, Nicole
Vazquez, Geeovanny Contreras,
and Victoria Miranda**

Advanced Achievers Academy



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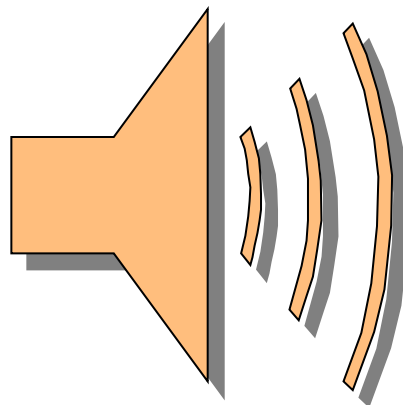
Challenge 5
Green Treasures
Fairchild's Pharmacy



Special Merit – Educational Content

Santiago Bonilla and Alejandro Velasco

St. Bonaventure Catholic School



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Challenge 6

Shade our School – Leaves are Cool!

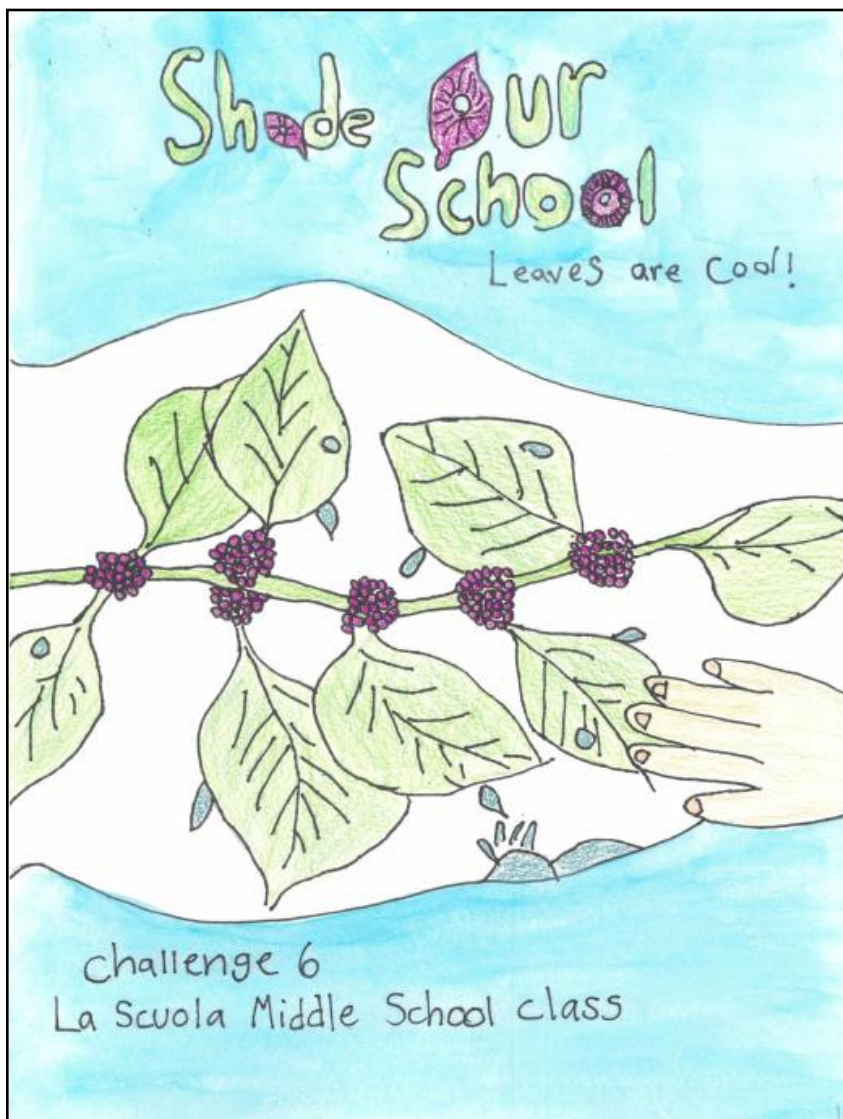
Despite rising temperatures, plants may be able to use different tricks to regulate their leaf temperatures and avoid overheating. **Similar to how humans sweat to cool down, plants can use transpiration to lower their leaf temperatures.** However, as many scientists predict decreases in rainfall and increasing temperatures for many parts of the world – including much of the tropics and subtropics – **those plants that rely on transpiration to keep cool may be especially threatened by global climate change.** This year, **students helped scientists at the University of Miami to conduct a series of experiments to characterize transpiration rates across different plant species** to see which species fare best in the future. **Students** used standardized methods to collect scientific data and **created an illustrated field journal documenting their observations.**

Challenge 6
Shade our School –
Leaves are Cool!



FIRST PLACE

La Scuola



[Click image to learn more about this entry.](#)

Challenge 6
Shade our School –
Leaves are Cool!



SECOND PLACE

Aventura Waterways K-8 Center

AWK-8 LEAF LADIES FIELD JOURNAL

Challenge 6: Shade our Schools – Leaves are Cool!



Aventura Waterways K-8 Center
Teacher: Mr. Livan Escudero

Team members

Maia Gueron	Gr. 8
Avril Ramirez	Gr. 8
Abihail Samuels	Gr.8

Isabella Sanmiguel (illustrations) Gr.8



[Click image to learn more about this entry.](#)

Challenge 6
Shade our School –
Leaves are Cool!



Special Merit – Depth of Research

Mater Lakes Academy Middle School

Shade Our Schools- Leaves Are Cool! Data and Field Journal



Mater Lakes Academy Middle School
8th Grade - Research Fairchild Bears



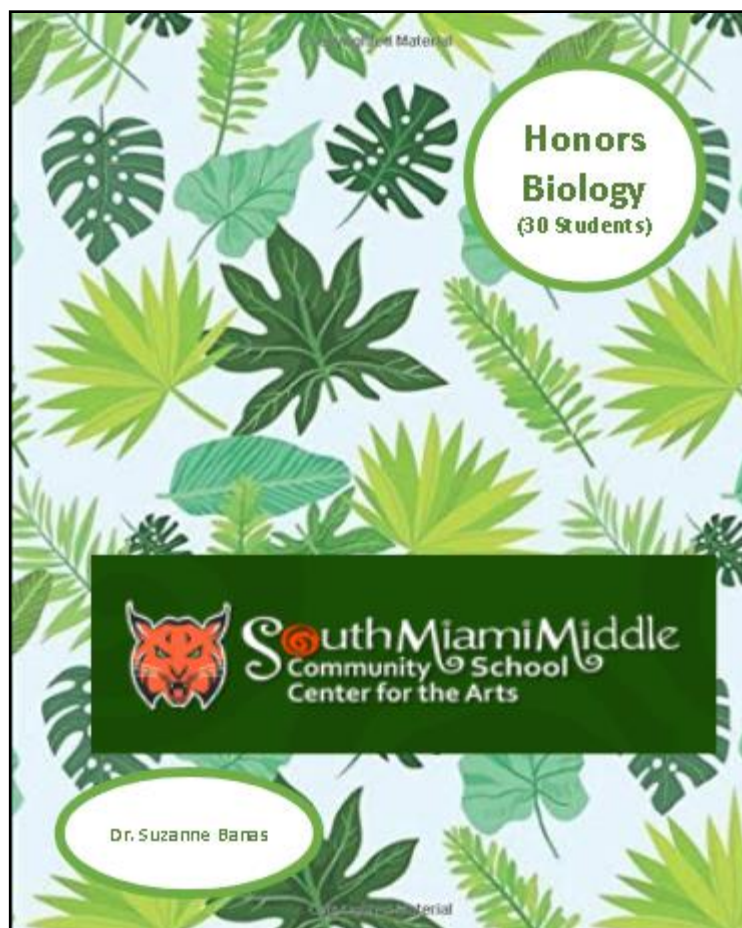
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Challenge 6
Shade our School –
Leaves are Cool!



**Special Merit –
Relevance to Theme**

South Miami Middle School



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Challenge 6
Shade our School –
Leaves are Cool!



Special Merit – Artistic

St. Kevin Catholic School

St. Kevin Catholic School
Field Journal



Mrs. De Novi

Transpiration Team: 8 students

[Click image to learn more about this entry.](#)