#MyScienceFuture:

Students dress-up as scientists in education project promoting science careers, environmental identity, and nature connection at a Florida field station

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ARCHBOLD
BIOLOGICAL STATION

#MyScienceFuture

Proof of Concept

This document is a proof-of-concept of sorts for Archbold's #MyScienceFuture project, an overview of the project that includes my insights as the originator and practitioner. I've also tried to offer questions that may stimulate an environmental education researcher. My hope is to find partners and funding to further improve, evaluate, and scale up the project.

Some Background on #MyScienceFuture

This project started as a concept I wasn't sure I could pull off. I have been photographing the science and conservation community in the region since 2014, but until #MyScienceFuture I hadn't tried integrating this with our children's programs. When planning Archbold's Ecology Summer Camp in 2019, I decided to introduce the scientist portraits and attempt to photography the students in scientist dress-up. Logistically, this meant that instead of 1-2 hours per person, I had only 45 minutes to photograph approximately 18 campers and teen volunteers each week. Could I do it, would I be satisfied with the quality of the photos, and would it support the camp's mission? Starting with these questions, I created the #MyScienceFuture project. I remember being anxious and hopeful going into that first week of camp. The results that summer exceeded my expectations, and since then I have run variations on the project with college students and children at community festivals. In 2022, I made several improvements and again ran the full program for Archbold's summer camp.

Methods

This document may give the false impression that the project was methodically organized and facilitated in a controlled and repetitive manner. In truth, the project was born from a "let's see how this works" attitude and developed from week to week (especially in 2019) as I tried new things and adapted based on student engagement. During the first summer, the project did not have evaluation in mind. This document includes examples of student work from both years and does not distinguish between them. In addition, the adult portraits in this document are all from my *Florida Stewards* project, not limited to the selection the children viewed.


Lydia Landau


Micah, age 11

Photos from Archbold's Ecology Summer Camp in 2022

Embedded in a Summer Camp

The #MyScienceFuture project activities are embedded within a weeklong ecology-themed summer day camp for children at a biological field station in rural Venus, Florida, part of the Headwaters of the Florida Everglades. During camp, children visit multiple natural habitats, meet scientists, and participate in a variety of science activities. #MyScienceFuture is intended to be a memorable part of camp and to reinforce other camp experiences, contributing to the camp's goals of improving environmental identity and nature connection in children. Watch a slideshow with photos from all 2022 camp sessions here.

#MyScienceFuture Demographics

2019	2022
98 total participants	76 total participants
Gender 40% girls 60% boys	**Gender** 43% girls 57% boys
Race/ethnicity 78% White 20% Non-white Hispanic/Latinx 2% Black	**Race/ethnicity** 71% White 28% Non-white Hispanic/Latinx 1% Black

#MyScienceFuture

1 Project: 5 Activities

Activity ONE
INVESTIGATING PHOTOGRAPHS
Students view portraits of scientists and practice visual thinking strategies

1

Activity TWO
DRAWING SELF PORTRAITS
Students draw themselves as scientists.

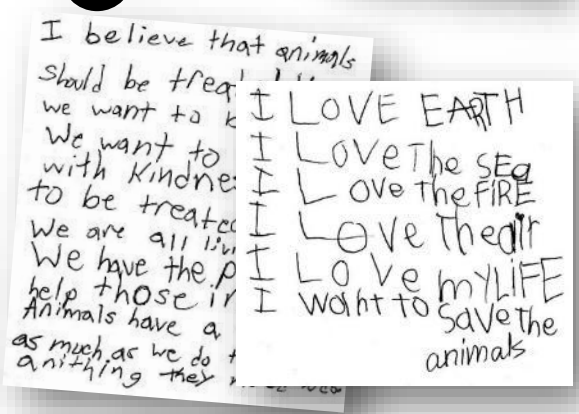
2

Activity THREE
DRESS-UP PHOTO SHOOT
Students dress up as scientists and model for a photo portrait.

3

Activity FOUR
REFLECTION WRITING
Students reflect on their finished portraits and write messages to go with them.

4



Activity FIVE
FRAMED FINISH
Students receive a framed copy of their photo portrait and writing.

5

Activity ONE

INVESTIGATING PHOTOGRAPHS

INVESTIGATING PHOTOGRAPHS

Using paintings and photos is a great way for students to build their knowledge through observation and discussion. The scientist portraits show clothing, tools, and environment – all are clues the students use to piece together what kind of science each subject works in.

Campers investigate the photos in an instructor facilitated group discussion using large prints or a digital slide show. These process is facilitated using a concepts from both *Visual Thinking Strategies* (Yenawine, 2013) and a BEETLES activity called "I Notice, I wonder, It Reminds Me Of" (beetlesproject.org).

The strategy common to both these sources is to teach through discussion, instructing students to first make comments based on sensory observations before moving to inferences, and for students to share the evidence for their claims. The idea is to develops a student-centered curiosity-motivated language toolset that empowers student knowledge building and improves learning retention Unlike in these sources, I do provide answers after the students finish their claims. I want them to learn about the process of field science and connect to the scientists and the natural environments in the pictures.

"I Notice, I Wonder, It Reminds Me Of"

During the activity, students pick up a natural object, such as a leaf, and make "I notice…" statements out loud with a partner, then share some of their observations with the group. They do the same with "I wonder…" questions, and with "It reminds me of…" connections. Then, students practice using these tools while exploring whatever they find interesting. This simple routine can help students get beyond seeing nature as a "green blur," and lead them to never be bored in nature again.
-BEETLES

Visual Thinking Strategies
1. What's going on in this picture?
2. What do you see that makes you say that?
3. What more can we find?
Yenawine, 2013

INVESTIGATING PHOTOGRAPHS

In #MyScienceFuture, students investigate a selection of scientist portraits. These heroic-looking scientists, standing proudly in beautiful landscapes, are intended as role models for the viewers, promoting science careers and fostering *environmental identities* and *nature connections*.

Archbold's Program Director of Education, Dustin Angell is also an independent conservation photographer. His largest project, the **Florida Stewards**, includes over 100 portraits of the science and conservation community working in the Headwaters of the Florida Everglades. These Stewards are photographed in their work attire, holding the tools of their trade, and posing in a natural setting related to their work. The project's unifying style usually includes a mix of artificial and natural light, front-facing subjects who make direct eye contact with the viewer, and an upward looking point-of-view.

Representation Matters
In the selected portraits, children see that scientists don't all look the same or do the same things.

Some features of the selected science portraits:

- Diversity of race and age
- A variety of ecology and conservation job types
- Women in historically male-gendered roles
- Male and female representation for all careers
- A visibly pregnant field ecologist

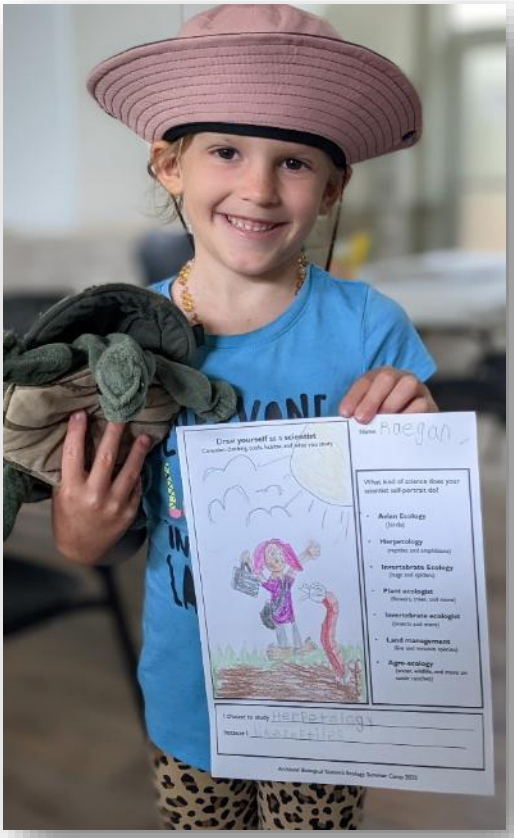
Will children accept the scientists in these photos as role models?

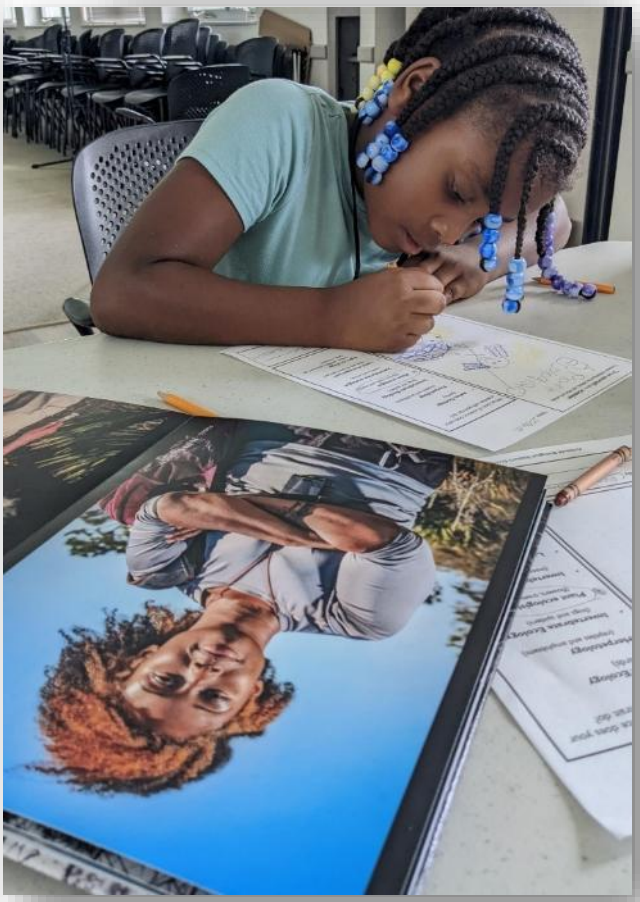
Activity TWO

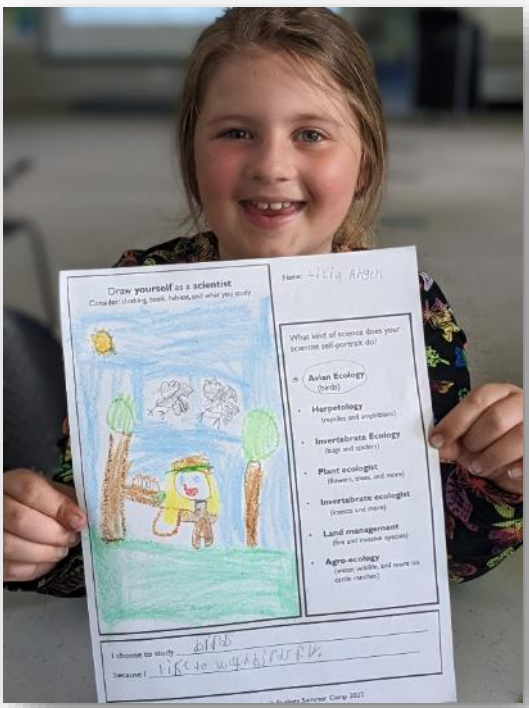
DRAWING SELF PORTRAITS

DRAWING SELF PORTRAITS

In the second activity, students are asked to **draw themselves** as scientists. Having children "draw a scientist" is a decades-old activity used by researchers to reveal children's stereotypes about scientists. In contrast, drawing self-portraits may encourage the children to push beyond stereotypes and engage the part of themselves that identifies with nature and science. The worksheet and photo examples help with this cognitive activity and hopefully reinforce the learning and self-identification that happened while investigating the photo portraits in the first activity. Making art may engage their emotions, too, reinforcing the activity.





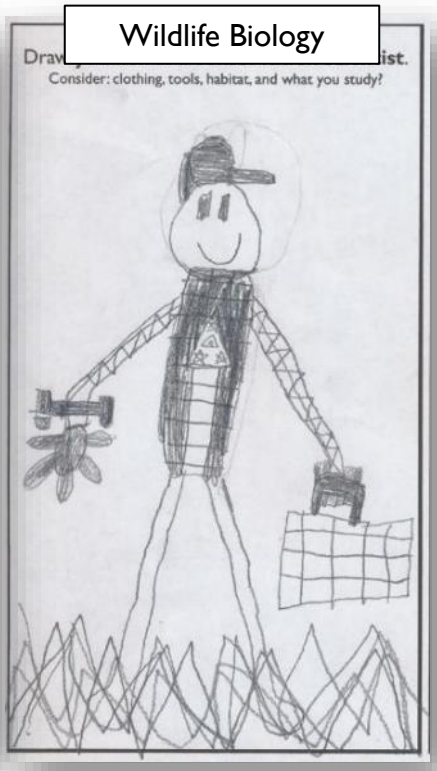


DRAWING SELF PORTRAITS

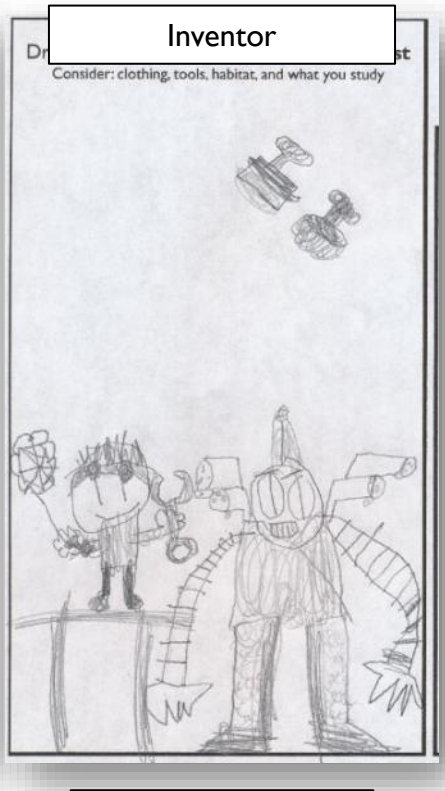
The students are encouraged to choose scientist careers from a list of examples that align with the photo portraits. Most of the children follow this prompt and most of those will use the photos as drawing aids; others will choose different science jobs, like inventor or marine biologist, or even non-science jobs like animal lawyer or artist.

Avian Ecology

Wildlife Biology



Inventor



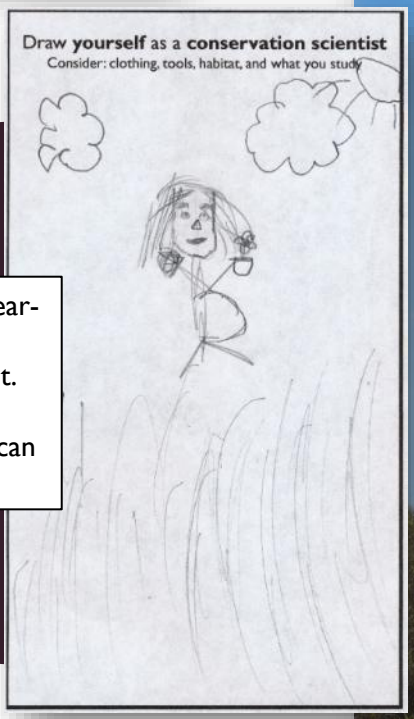
Plant Ecology

Herpetology

Animal Lawyer

DRAWING SELF PORTRAITS

Some drawings are directly inspired by specific photo portraits. When this happens, campers usually, but not always, imitate someone of the same gender as them. Here are some examples:



Imitating Stacy, this 12-year-old drew herself as a pregnant plant ecologist. Stacy's portrait is a reminder that scientists can be moms, too.

DRAWING SELF PORTRAITS

I choose to study water, wildlife and more on cattle ranche

because I want to be like maya

Maya Zambrano-Lee

Steffan Pierre

DRAWING SELF PORTRAITS

Does gender determine science career choices?
During the 2019 inaugural year, the students' career choices in their self-portraits differed greatly by gender, with no overlap in their top 3 careers. Was this due to inherent preferences in boys and girls? Do girls like flowers, birds, and fuzzy animals; do boys prefer snakes and lighting fires? Or perhaps it was due to perceived stereotypes about science careers?

Or were they taking a cue from the photographic portraits?
In 2019, the book of portraits the children were shown included a portrait of only one plant ecologist, the photo of a visibly pregnant Stacy Smith, and only one Land Manager, Kevin Main surrounded by smoke. Were the children searching for gender cues when looking for science role models?

What happens when science representation has gender parity?
In 2022, I updated the book of photo portraits to include gender parity for all represented careers. I included portraits of two male Plant Ecologists and one female Land Manager. I even created two versions of the book with these new portraits as alternate covers. In 2022, once exposed to the new book, the top choices for girls and boys shifted. I had worried this change would hinder identification with a career choice, but both girls and boys maintained some consistency from 2019; their previous top choices still score high, but now we see some overlap with Avian Ecology and Herpetology as popular choices with boys and girls. It should also be mentioned that in 2022 the campers met Avian Ecologists and Herpetologists before doing this drawing assignment, which may have influenced these choices.


Kevin Main


Elysia Dytrych

2019	2022
Top Career Choices 1. Land Manager (18%) 2. Wildlife Biologist (13%) 3. Plant Ecologists (13%)	**Top Career Choices** 1.a. Avian Ecology (23%) 1b. Herpetology (23%) 2. Agro-ecology (15%) 3. Land Management (13%)
Top Choices from Girls 1. Plant Ecologist (24%) 2. Ornithologist (18%) 3. Mammologist (15%)	**Top Choices from Girls** 1. Avian Ecology (30%) 2. Herpetology (19%) 3. Plant Ecology (15%)
Top Choices from Boys 1. Land Manager (31%) 2. Herpetologist (14%) 3. Wildlife Biologist (12%)	**Top Choices from Boys** 1. Herpetology (26%) 2a. Agro-ecology (17%) 2b. Avian Ecology (17%) 2c. Land Management (17%)


Seth Raynor

Step THREE

DRESS-UP PHOTO SHOOT

DRESS-UP PHOTO SHOOT

In activity three, the students dress-up and pose for their own scientist photo portraits with Dustin Angell. They have access to most of the same science equipment seen in the adult scientist portraits. Dustin replicates the process and style he uses in his adult photo shoots as much as possible.

Campers can dress-up as a specific type of scientist or mix-and-match the supplies in whatever way they like. Dustin directs these "models," but the phot shoot is a collaborative process.

Ren, 10 years old

Elisha, 8 years old

Dante, 12 years old

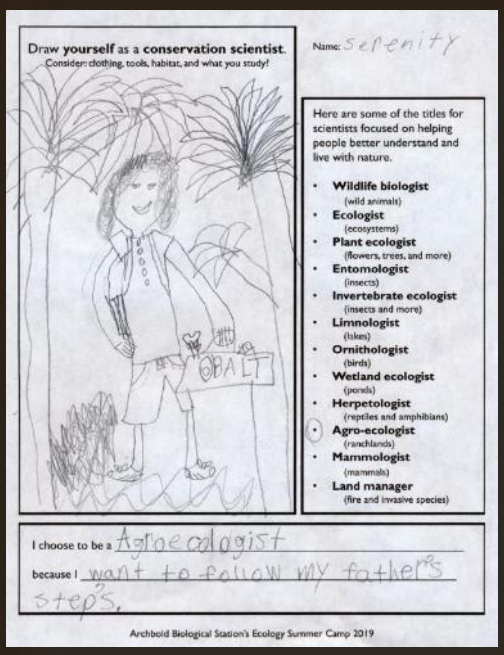
Jessica, 8 years old

DRESS-UP PHOTO SHOOT

Students sometimes want to dress-up and pose as specific people from the Florida Stewards photo project. This seems to usually happen with children whose family member is in the photo project. Eva wanted to be like her older sister and Serenity wanted to be like her dad.

Eva, 8 years old

Lexi Siegle (Eva's sister)



Draw **yourself** as a **conservation scientist**.
Consider: clothing, tools, habitat, and what you study!

Name: Serenity

Here are some of the titles for scientists focused on helping people better understand and live with nature.

- **Wildlife biologist** (wild animals)
- **Ecologist** (ecosystems)
- **Plant ecologist** (flowers, trees, and more)
- **Entomologist** (insects)
- **Invertebrate ecologist** (insects and more)
- **Limnologist** (lakes)
- **Ornithologist** (birds)
- **Wetland ecologist** (ponds)
- **Herpetologist** (reptiles and amphibians)
- **Agro-ecologist** (ranchlands)
- **Mammologist** (mammals)
- **Land manager** (fire and invasive species)

I choose to be a Agroecologist

because I want to follow my father's steps.

Archbold Biological Station's Ecology Summer Camp 2019

Serenity, 8 years old

Steffan Pierre, (Serenity's dad)

DRESS-UP PHOTO SHOOT

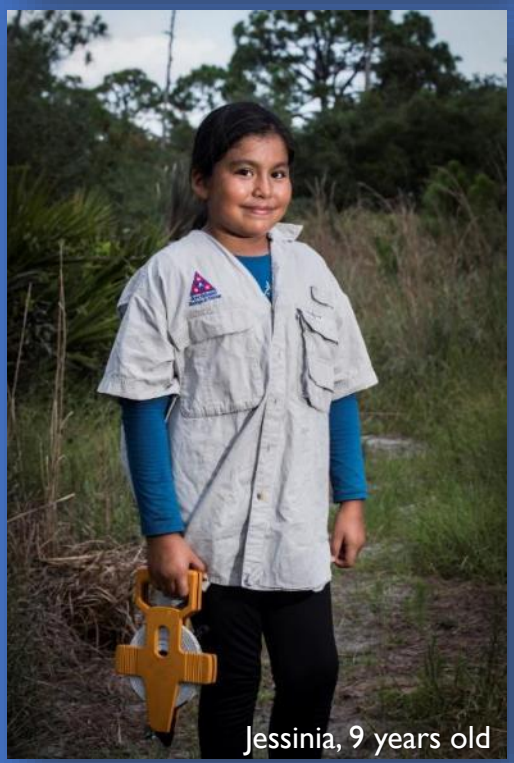
In 2022, 48% of the dress-up photos matched the career of the student's self-portrait (when the supplies were available). For nearly half the students, it appears the photo shoot is a chance to reaffirm their self-portrait identities from activity two.

DRESS-UP PHOTO SHOOT

Some campers have participated in #MyScienceFure in 2019 and 2022. Kennedy came back as a teen volunteer.

2019

Kennedy, 11 years old



Jessinia, 9 years old

2022

Kennedy, 14 years old

Jessinia, 12 years old

DRESS-UP PHOTO SHOOT

Some campers have participated in #MyScienceFure in 2019 and 2022.

2019

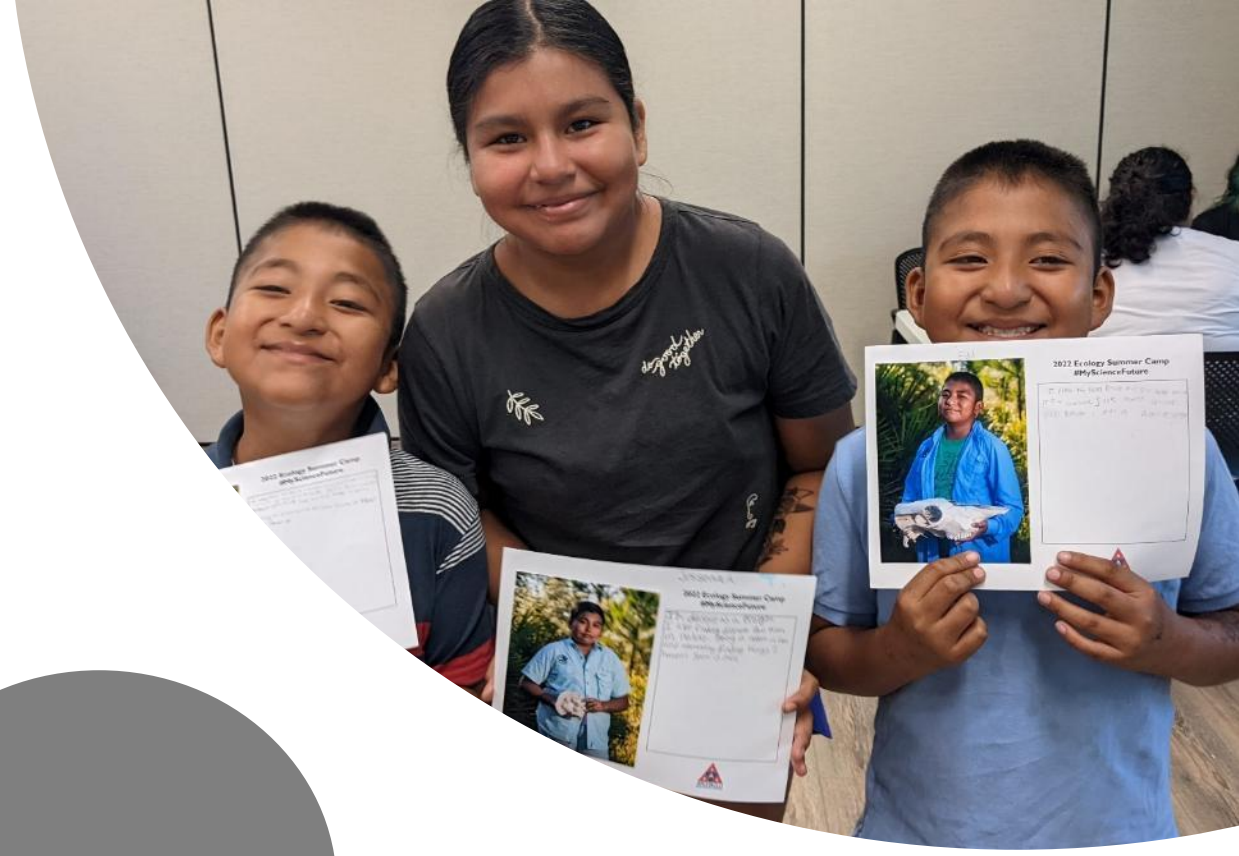
Cristian, 8 years old

James, 9 years old

2022

Cristian, 12 years old

James, 12 years old



Activity FOUR

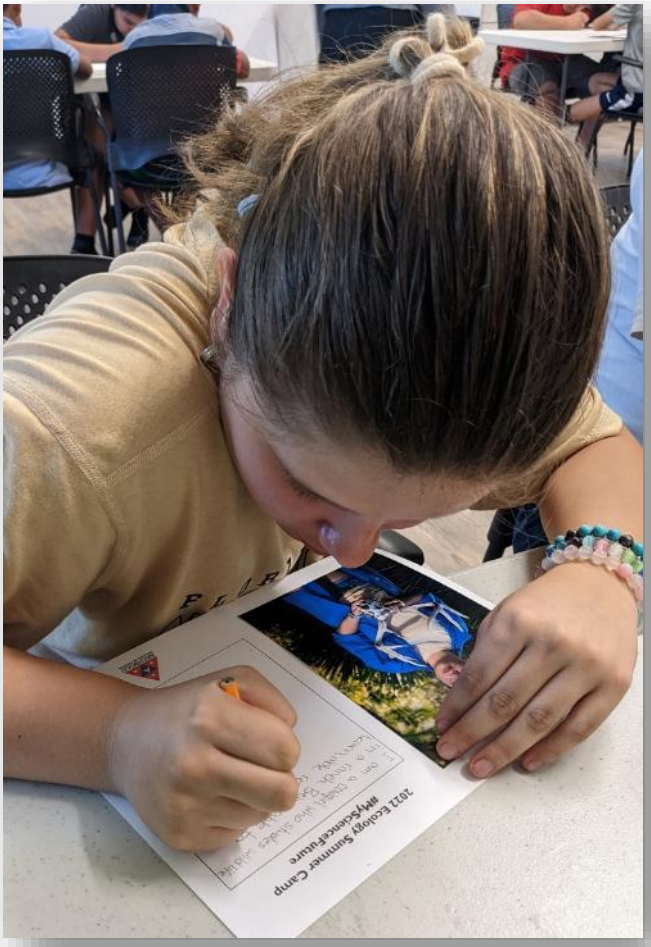
REFLECTION WRITING

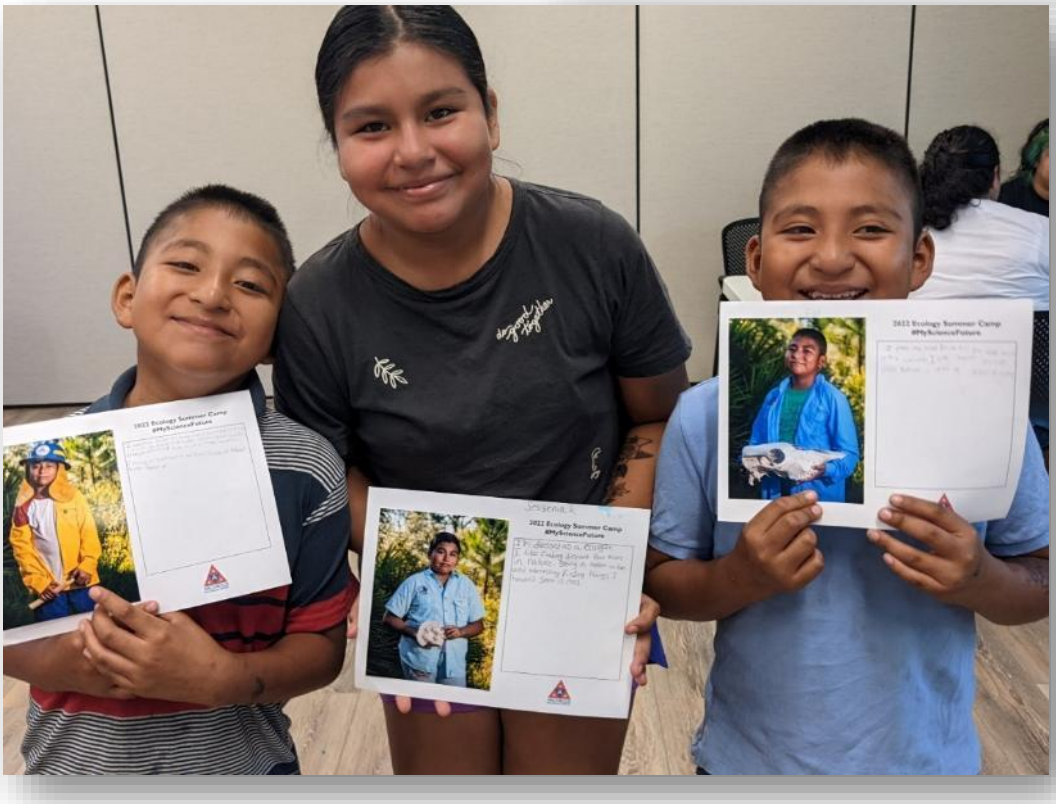
REFLECTION WRITING

In activity four, students look at a print of their dress-up portrait and are asked to write a message to accompany it. Their writing prompt is open ended, but they are told that the writing should help the viewer better understand the photo.

Most of the reflections in 2022 reference the photos directly or indirectly (70%) and express the students' interest in nature or science (67%). The writings also mention science/conversation careers (30%), express the attitude that nature should be cared for (27%), and reference camp (23%). A few of the campers write about family (6%) or a career outside of the environment and conservation.

This writing piece is intended as another chance for students to think about their environmental identities and experience their connection to nature.





REFLECTION WRITING

help the Earth

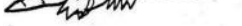
I want to be Ornithologist so I can save Scrub-Jays from extintion and save the world!

I chose a Wildland firefighter because my dad is a firefighter I think its important because you have to help the enviroment.

I picked this because I like cats.

herpatology where a reptile can be a reptile person

Study reptile people



my furite thing i did was Go in the second challenge and i want to be a animal biologist.

I want to be a bird whacher because they are cool. the colgr are cool.

Dont be afrad to do what you want todo in life.

I Want to be a land manager. I Want to be a land manager because i like to do hard stuff.

I LOVE EARTH
I LOVE The SEa
I LOve the FIRE
I LOve the air
I LOve mY LIFE
I Want to Save the animals

iam in ornatholog ist so take cain of the Birds !!!!

REFLECTION WRITING

Alan, 10 years old

Treat natrue like kindness.
I dress like a Florda
Scrub jay biologist. they
are my number 1 best.

Katy, 11 years old

I want to be an ornithologist because I have two sunconures as pets. They make me want to save birds in the wild because if my sun conures were birds in the wild, I would definitely want to save them! If I were to be an ornithologist, I would be able to save and research birds in the wild! I think it would be cool if I were to be an ornithologist.

REFLECTION WRITING

Kassidy, 11 years old

I want to be a Land Manager because I want to save nature. I wanna save natore cause I'm always outdoors and I don't want nature to be destroyed. My dad is a Fireman so I wanna follow his footsteps. I know this isn't a Fireman but its the closest thing.

Royal, 10 years old

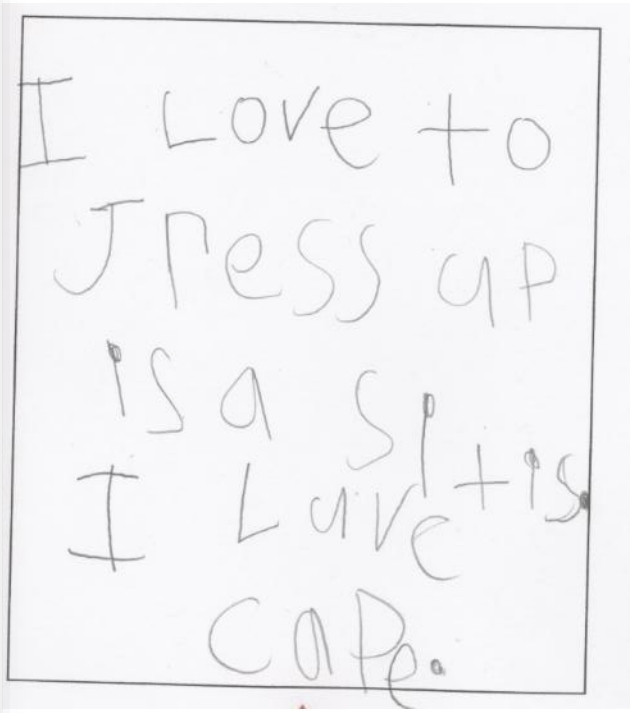
I really want to be an entomologist. I've always loved being in nature and collecting insects. I pin them and study them. I want to go to UF for College. They have one of the best entomology departments in the world. I love insects, traveling, nature, and science. Entomology is my Passion.

ENTOMOLOGY

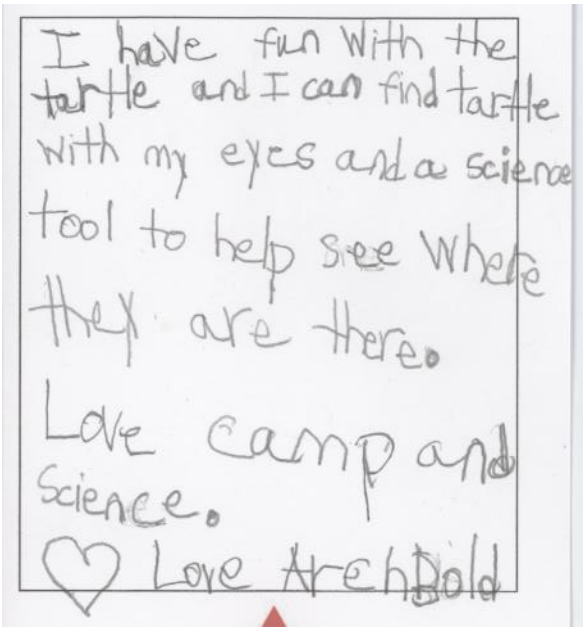
-Royal

REFLECTION WRITING

Emory, 7 years old



Heidi, 8 years old



REFLECTION WRITING

Sheila, 8 years old

I Put bird on becues I Like the colre blue. and I got bis chrap becuse to catch amalcs. I Like Art. I Like the Plant becuse they are Precty. and Save Mother EARTh. end I Like Stitch. becuse he is blue and cute and Shei a funey. end like fish.

Hudson, 11 years old

I chose to be a Herpetolegist because I enjoy going into nature and hearing all of the sounds, seeing all of the sights and smelling all the smells of nature.

REFLECTION WRITING

Alan, 10 years old

Treat natrue like kindness. I dress like a Florda Scrub jay biologist. they are my number 1 best.

Maddie, 9 years old

I feel that turtles are important and we need to protect them.

REFLECTION WRITING

Gabriel, 8 years old

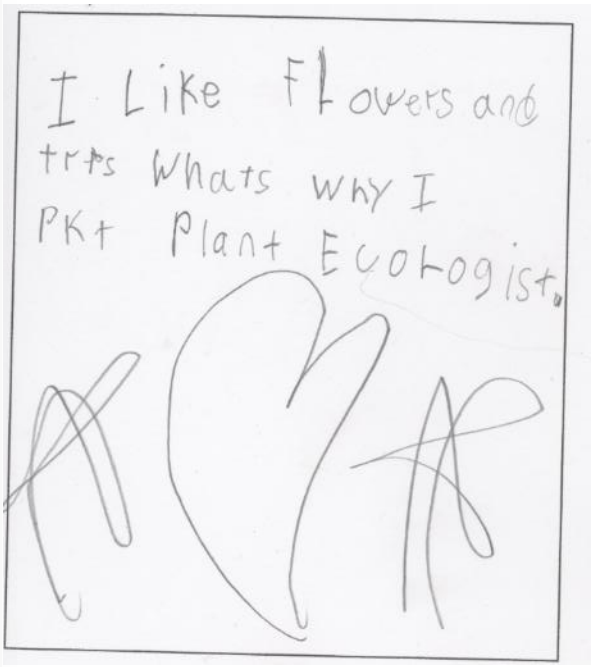
I wanted to be a Landmanagemen+ cause I want to help nature grow bifrint so other animal live were they want.

I have a hammer a yellow soot, a blue hat. Gabriel

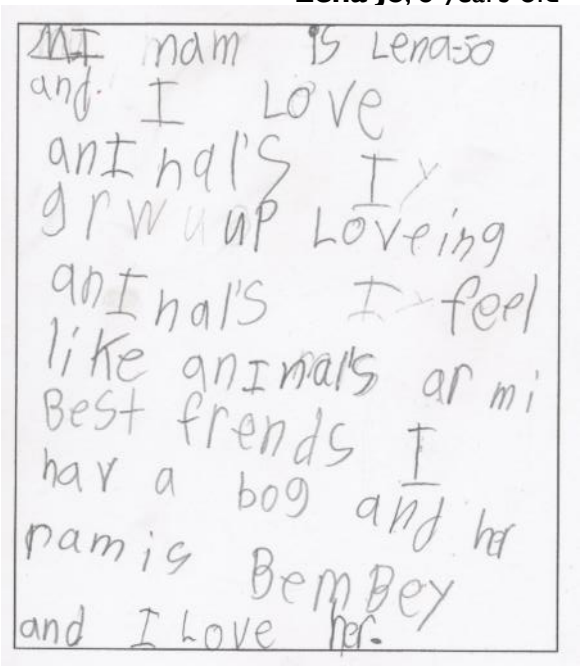
Josue, 8 years old

REFLECTION WRITING

Adeline, 7 years old



Lena Jo, 8 years old



REFLECTION WRITING

Cristian

I chose this becaese the birds and the wings are equal they represent freedom being able to leave your home being Free being able to see the night sky every day see the buety of nature is everything the bat the good everything see it's nice the cycles and the plants Lican a soft sponge plant but hard dried up mushrooms able to grow on decomposing organsums cauctsas able to grow with Little water see all these plants are amazing.

I think you should trate natere fairly and you should not pulet natere and I fell in love with natere when I was much yunger when I Lived by the wuds I will help any animal that is hurt and not filing good and prutekt enatere and the will life that it has.

Cristian's 2019 Message:
I think you should treat nature fairly and you should not pollute nature. I fell in love with nature when I was much younger, when I lived by the woods. I will help any animal that is hurt and not feeling well and protect nature and the wildlife it has.

Cristian's 2022 Message:
I chose this because
the birds and the wings are equal
they represent freedom
being able to leave your home
being free
being able to see the night sky every day.

See, the beauty of nature is everything
the bad, the good, everything.

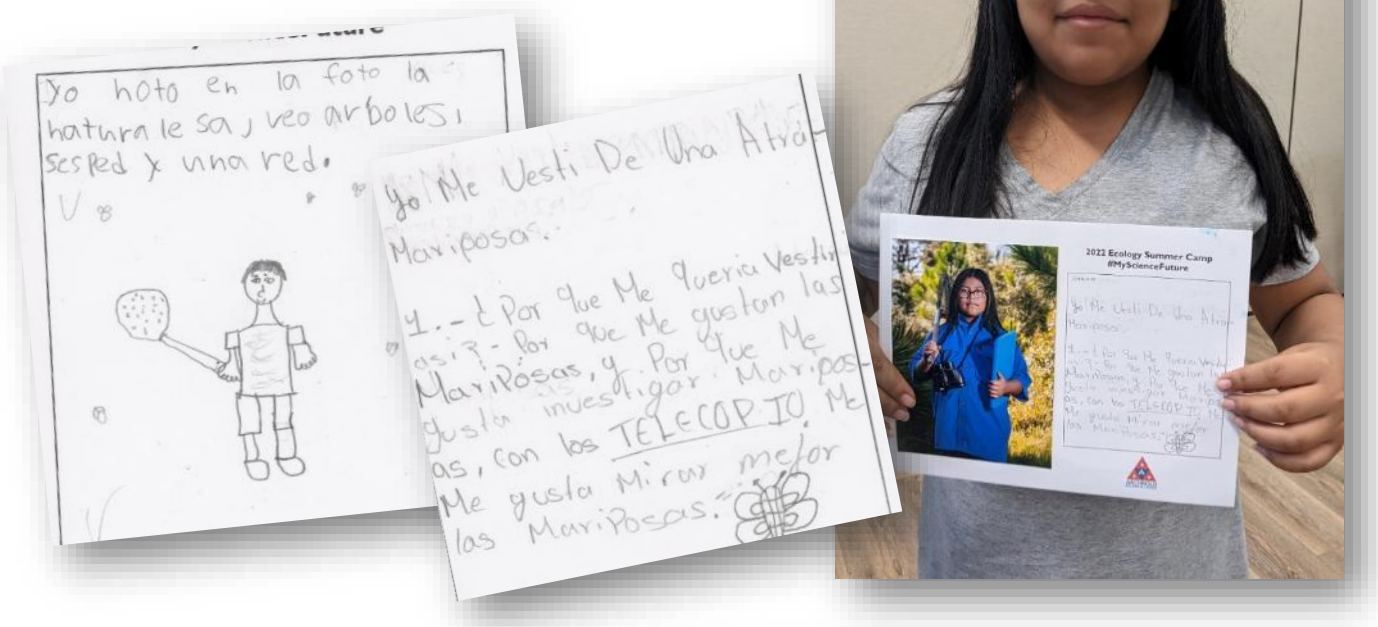
See, it's nice
the cycles and the plants
Lichen, a soft sponge plant
but hard when it dries up
Mushrooms, able to grow on decomposing organisms
Cactus, able to grow with little water.

See, all the plants are amazing.

REFLECTION WRITING

Providing a culturally relevant and inclusive experience starts with the selection of adult scientist portraits and carries through the project.

Language
Approximately 28% of the 2022 students are from Spanish-speaking families. During the reflection writing, they are welcome to write in English or Spanish.



Inclusive Connections
There is no one right way for children to relate to science and nature. Waylon didn't want to be photographed at first, but when I assured him that he didn't need to show his face in the photo and that he could hold an animal skull, he consented. Perhaps he had a difficult time imagining himself as a scientist. His writing implies that he does have a strong connection to nature, but instead of an interest in science or protecting nature, he connects by hunting with his father.


Waylon, 9 years old

I am holding a deer skull because I hunt these. I hunt these with my dad.

Activity FIVE
FRAMED FINISH

FRAMED FINISH

Graduation Slideshow
Each weeklong camp session concludes with an informal graduation ceremony. The campers watch a slideshow with photos from the week, including their #MyScienceFutuer photos. Then each camper is called up to the front of the room to receive their camp t-shirts. Some students will have also seen the slideshow the night before, if they attended the night hike event with their families.

Framed and Cherished
As part of the graduation ceremony, at the beginning or end, the students also receive the framed worksheet with their dress-up portrait and writing. After observing many past camp worksheets and art projects get carelessly damaged or left behind by the campers, and with the assumption that many more don't make it home in good shape, I decided to put these finished pieces in frames; the parents will want to keep the glass from breaking, so the portraits will arrive home safe, and the frames will make the art convenient to display. Perhaps the students will have daily exposure to their portraits for years to come, linking the ecology camp and their home, two parts of their learning ecosystem. At past camps, I have witnessed the positive phycological influence on children of putting their artwork in a frame. I hope the frames help the children to see these portraits as art objects, special items to protect and reflect upon.

Final Thoughts and Suggested Reading

FINAL THOUGHTS

Facilitator Impact
What effect does the facilitator have on this project? What does it mean that I spend time with the children all week, have know some of them for years, and that I am the photographer for both the scientist portraits and the dress-up portraits? In 2022, first-time camper Lydia chose to dress-up not as a scientist, but as me, writing "I am Mr. Dustin!"

Teen Spirit
Although the project wasn't envisaged with the teen volunteers as participants, many of them choose to take part. Most of these teens are former campers. What does #MyScienceFuture mean to them?

Alternative Process
How important is it to have professionally portraits photographed by Dustin? Could another adult take the photos? What if the children where the photographers? Would the act of working with a peer to create their dress-up portraits be more impactful than being photographed by an adult? I tried this with a small group that came for a field trip and the results were inconclusive.

A student (and father) photographs his brother.

SUGGESTED READINGS

Field Stations

National Research Council. (2014). *Enhancing the value and sustainability of field stations and marine laboratories in the 21st century*. National Academies Press.

Havran, J. C., Stowe, K. A., Blanchard, T. A., Kandl, K. L., Kimball, M. E., Richter, S. C., ... & Terhune, T. M. (2017). Meeting society's needs for education and discovery: A survey of eight field stations and marine laboratories in the southeastern United States. *Southeastern Naturalist*, 16 (sp10), 146-157.

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