GLOBE Year of Climate and Carbon

Past, Present and Future of GLOBE Climate Change Research & Action

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UNIVERSITY OF ALASKA FAIRBANKS

Photo by Emily Sousa

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GLOBE observations tell the story of our past,

and can help create the story of our future.

Imagine a tree.

1983

1983

First day of preschool, Aug. 1985

1985

Mother’s Day, May 1986

1986

Katie in Kindergarten, Theresa in Preschool

Nov. 1987

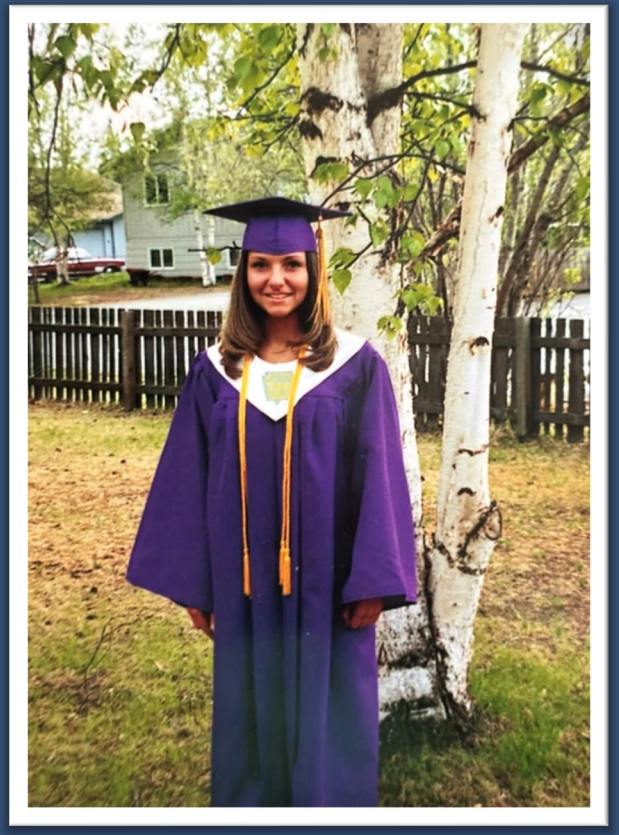
1987

A tree tells the story of years

1995

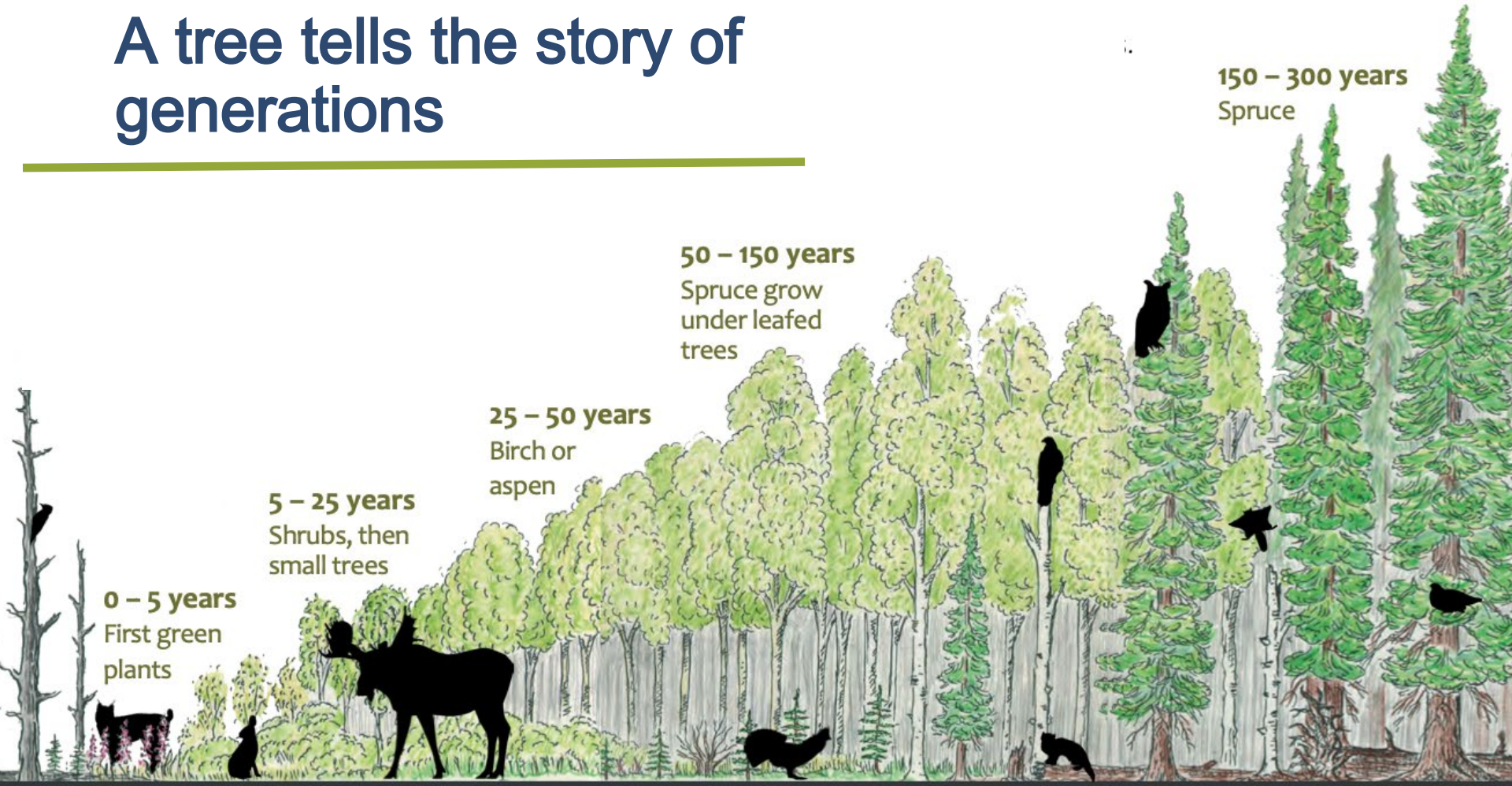
Theresa, 6th grade graduation

2001



Theresa, 12th grade graduation

A tree tells the story of generations



1984

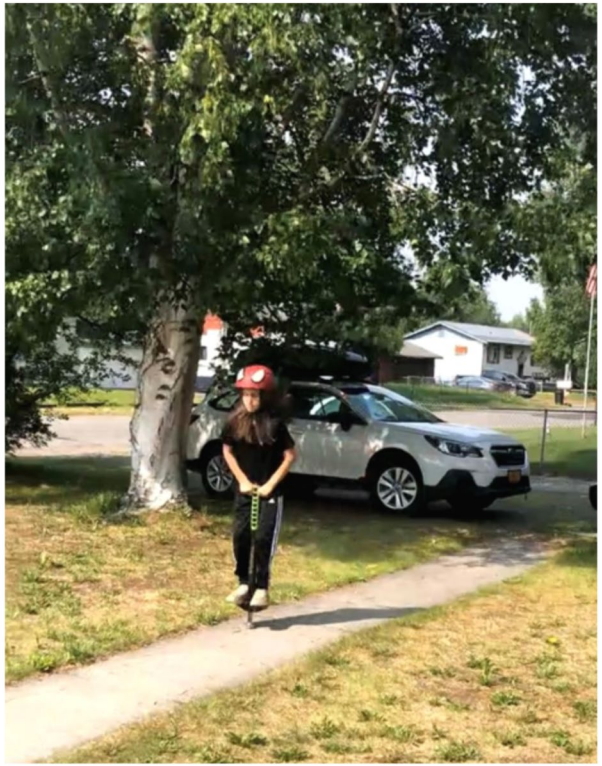
2020

Lisa and Katie

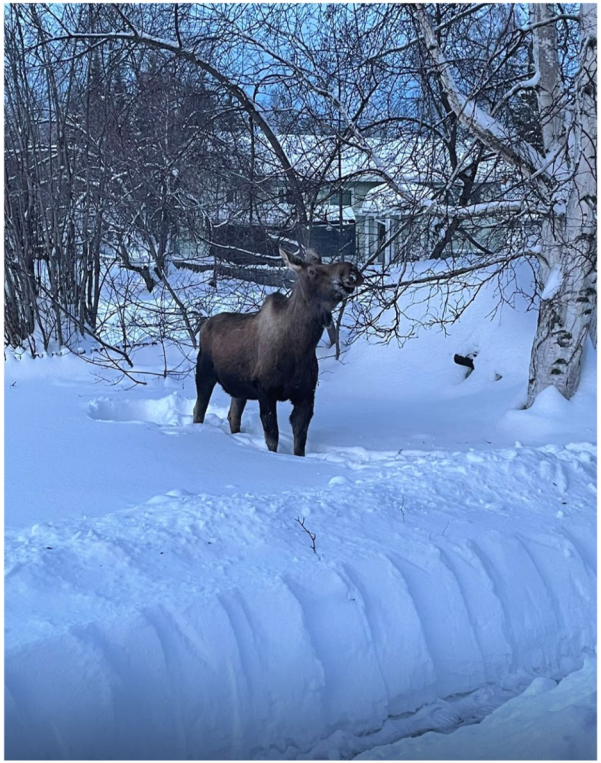
First day of running through the sprinkler in May

Simone and Izzy

Easter Egg Hunting
April 2021

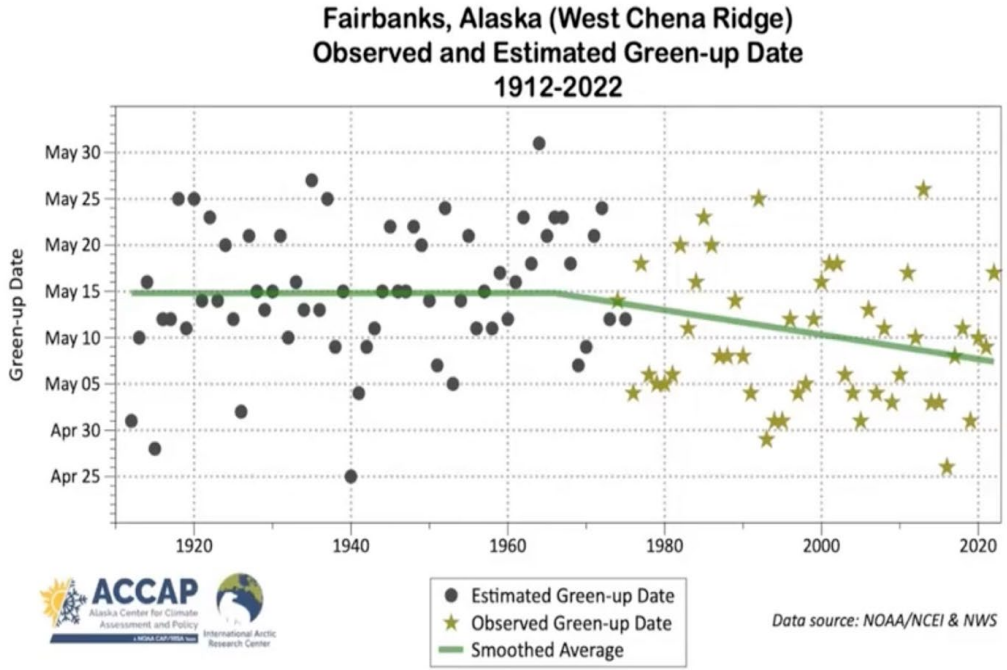


Pogostick Fun
July 2022

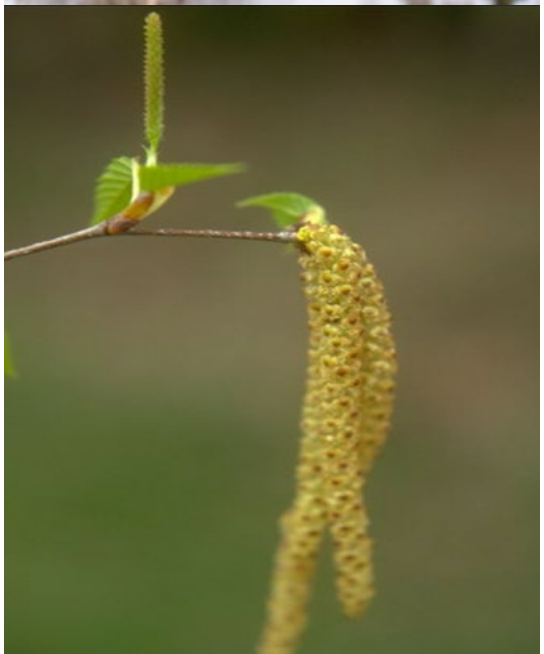


Moose Munching
March 2023

A tree tells the story of our changing climate



Alaskawildflowers.us

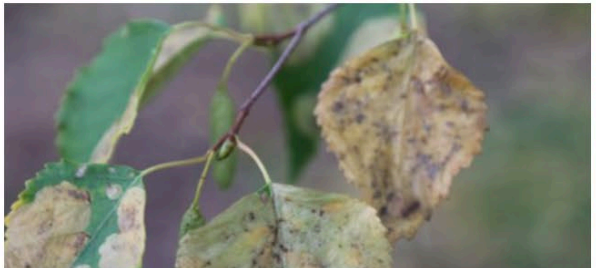


UNB Forestry

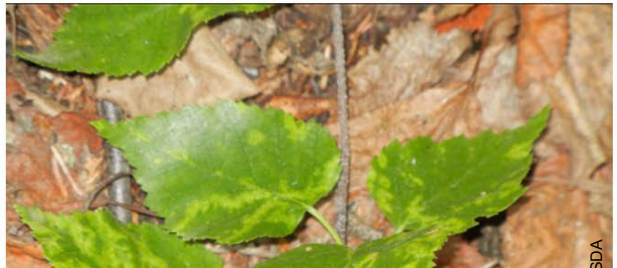
A tree tells the story of our changing climate

Dr. Glenn Juday, UAF

A tree tells the story of our changing climate



Birch Leaf Miner



Birch Broom Virus

Birch Nectria Canker Fungus

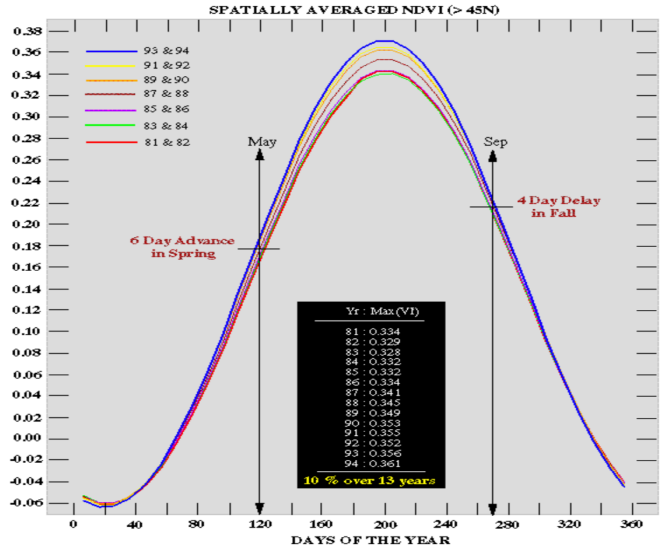
A tree tells the story of our changing climate

Can a tree tell the story of the future?

GLOBE Year of Climate and Carbon

PAST

Origin of the GLOBE Green Down Protocol



Myneni,R.B. et.al. 1997. *Nature*, 386, 698-702.

Photo by Nancy Johnson and Michelle Boyden

Globe students Jackie M., Devona C., Leianna H. and Rosie L. work as a team checking their plot every day during spring and fall.

PAST

Origin of the GLOBE Green Down Protocol

Photo by Nancy Johnson and Michelle Boyden

Color charts to track the color changes in the leaves in their GLOBE study plots are used by students.

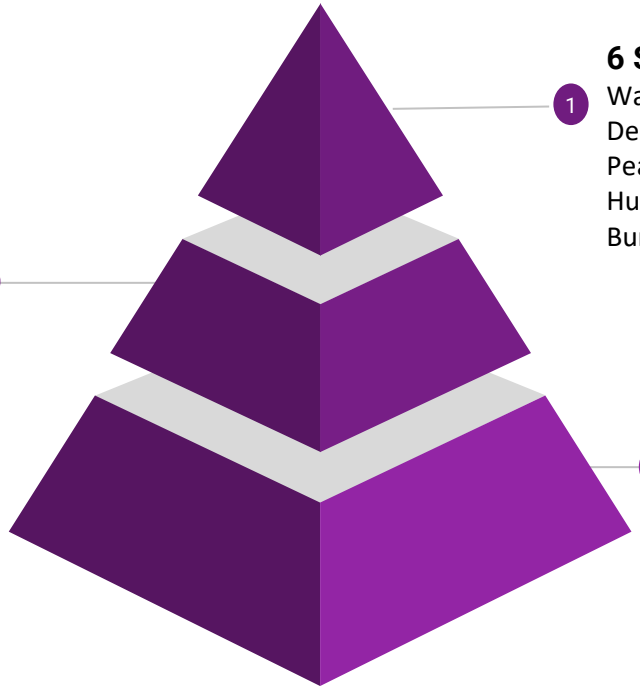
Agroborealis, 1999

PAST

Origin of the GLOBE Green Down Protocol

PRESENT

GLOBE Year of Climate and Carbon in Fairbanks, Alaska

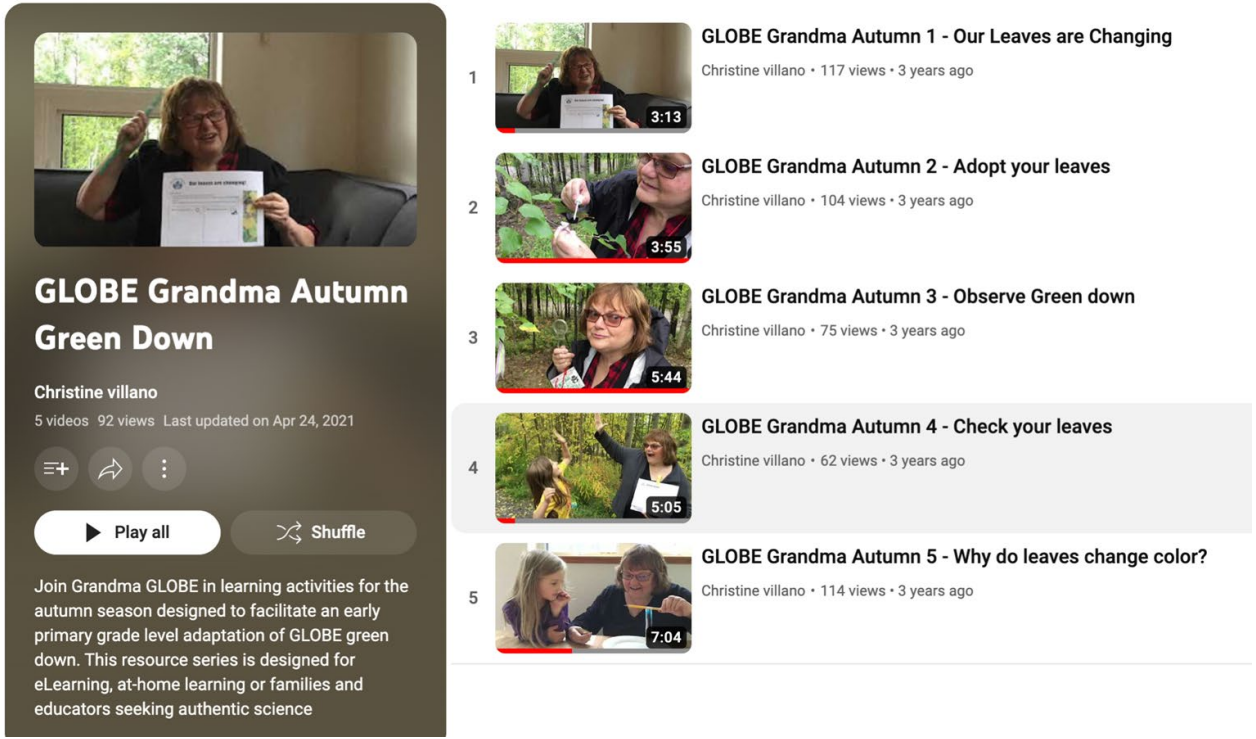


6 Schools
1. Watershed Charter
Denali Elementary
Pearl Creek Elementary
Hunter Elementary
Bunnell House Preschool

15 Classrooms
2. Pammy, Hensel, O'Regan, Norton, Addis, Fields, Koster, Keller, Graves, Perez, Defilippo, Tellup, Jelinek, Palmer, Duncan

3. **362 Students**

GLOBE Grandma Green Down



https://arcticandearthsigns.alaska.edu/globe -grandma

Observe Green-down

Date _____

Name _____

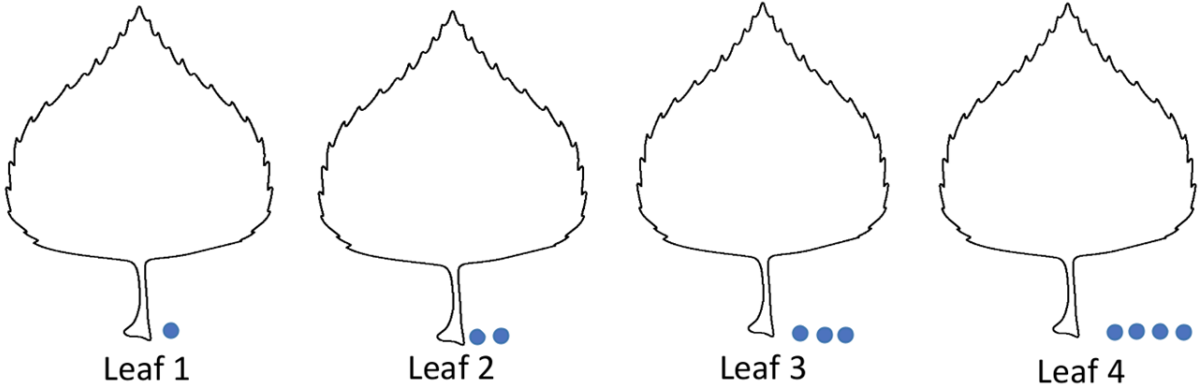
Type of Tree _____

Instructions:

1. Go outside and check your adopted 4 leaves.
2. What color is each leaf? Match the color on the GLOBE leaf color chart to each leaf.
3. Write the color code in the leaf to the right.
4. If the leaf has more than one color, write the color that takes up most of the leaf.
5. If the leaf has fallen, write “fallen” in the leaf or put an X on it.
6. You can color the leaf in like a scientist with a crayon that matches. Be sure to write the color code in the leaf.

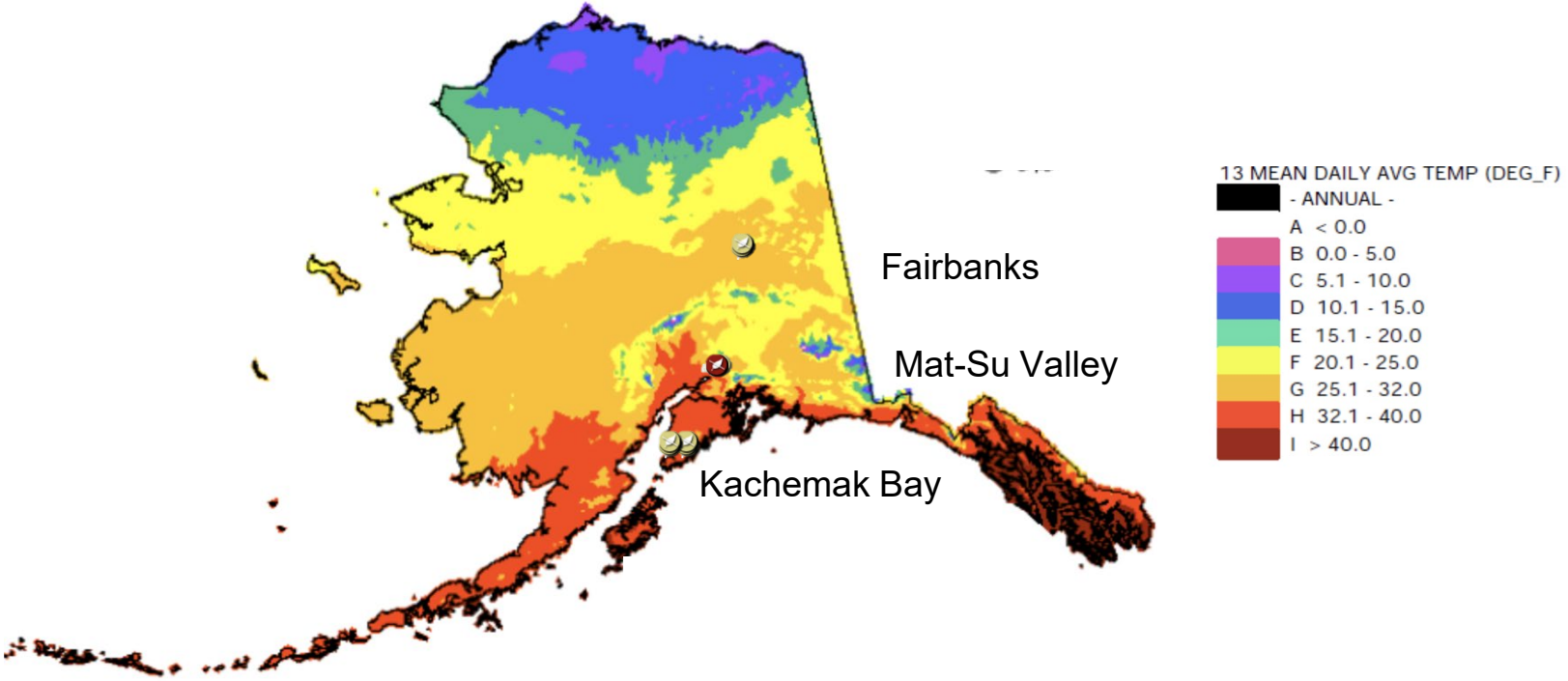
Example

Leaf 1



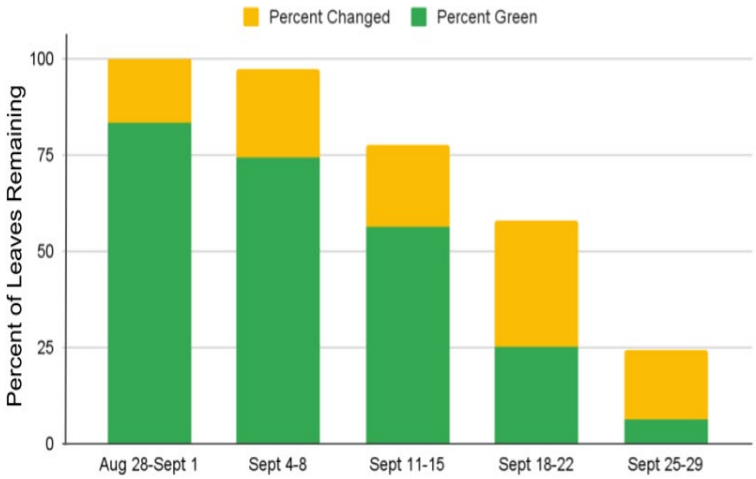
Credit: GLOBE Grandma series for primary grades, Arctic and Earth SIGNs project. *C. Villano*

2023 YCC Leaf Green Down Sites in Alaska

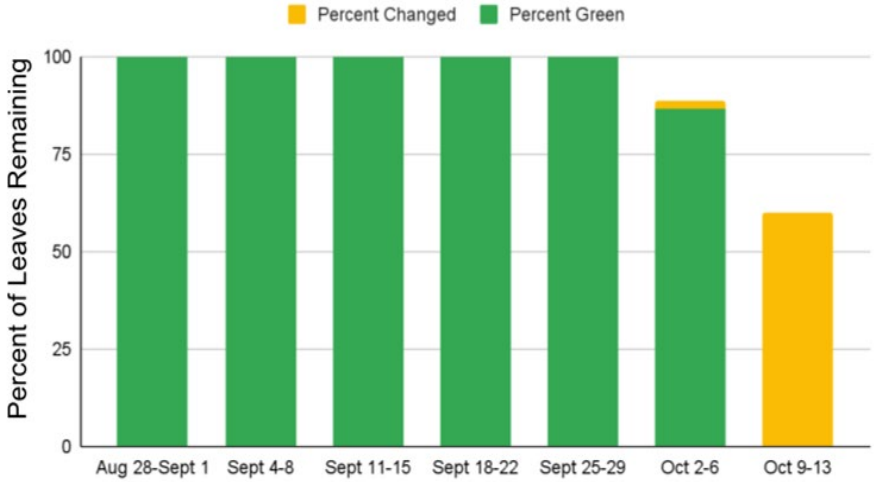


Birch Leaf Green Down 2023

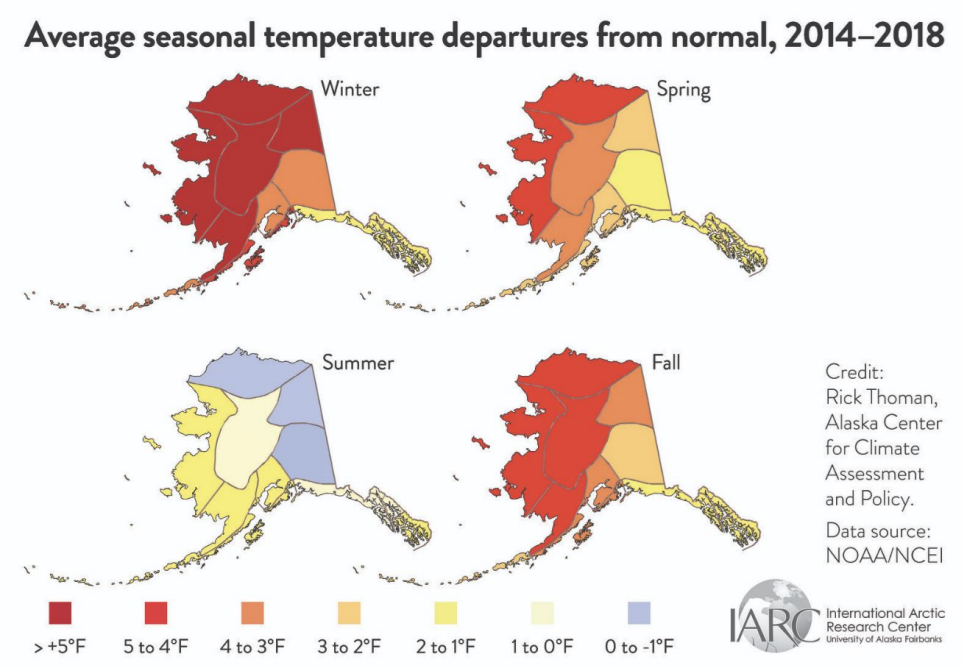
Fairbanks, Alaska

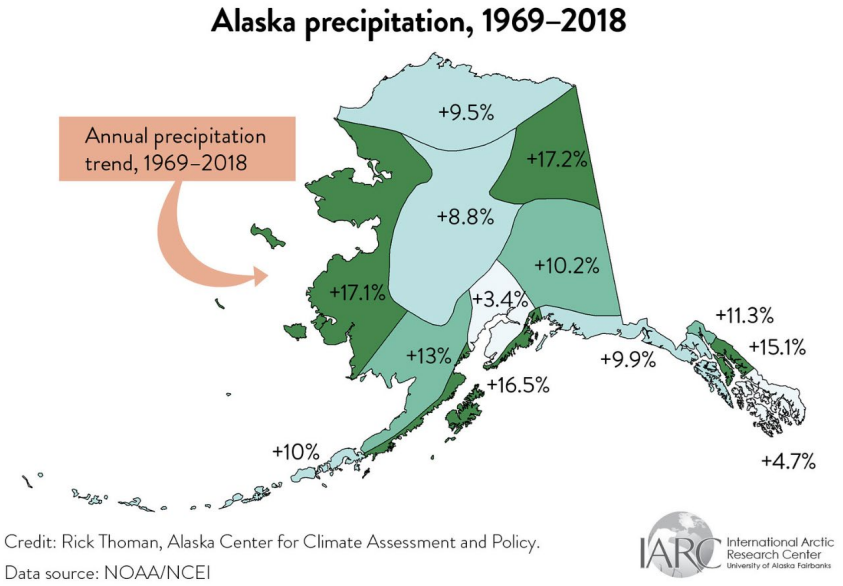


Mat-Su Valley, Alaska



Climate Trends for Alaska

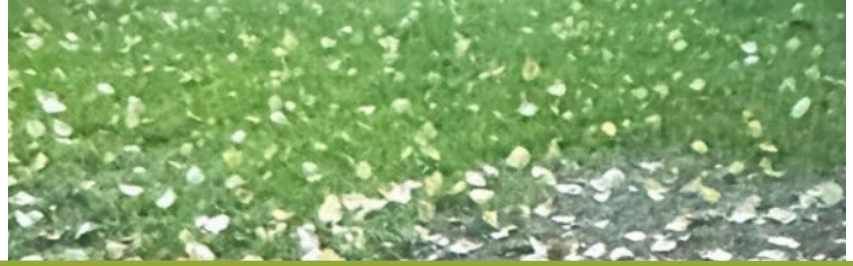




Each observation tells a story about the past

We cannot change the past.

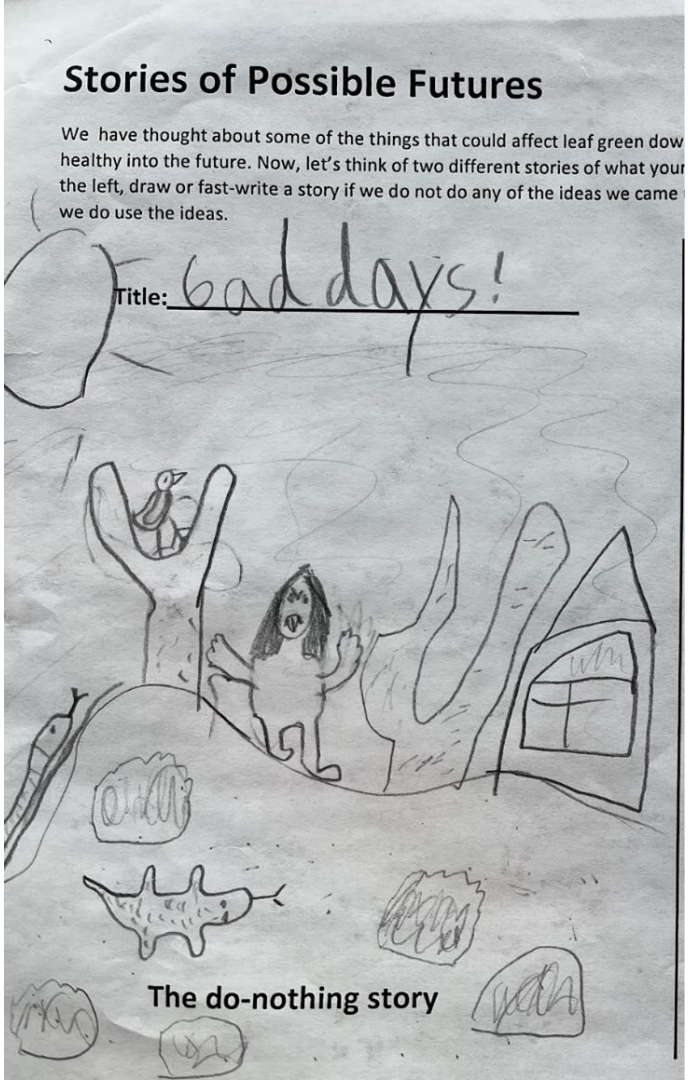
But we can change the future.



Scenarios Storytelling

What trends were in the data?

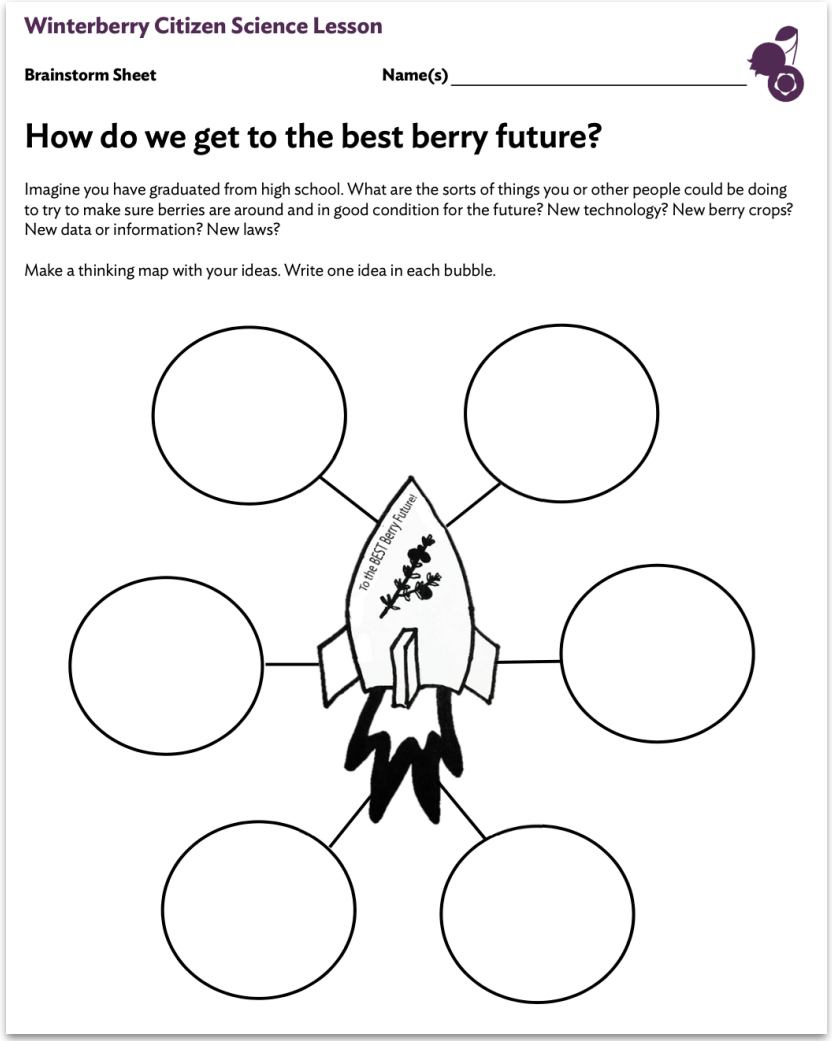
If green down season started later and fall is warmer, what will the climate future look like if we do nothing?



Imagine your tree again.

We don’t have to accept this do-nothing future!

1. Brainstorm some ways together that you and your community could make a better climate future.
2. Record some ideas.
3. Discuss how your story would change if you took one or more of these actions.



Winterberry Citizen Science Lesson

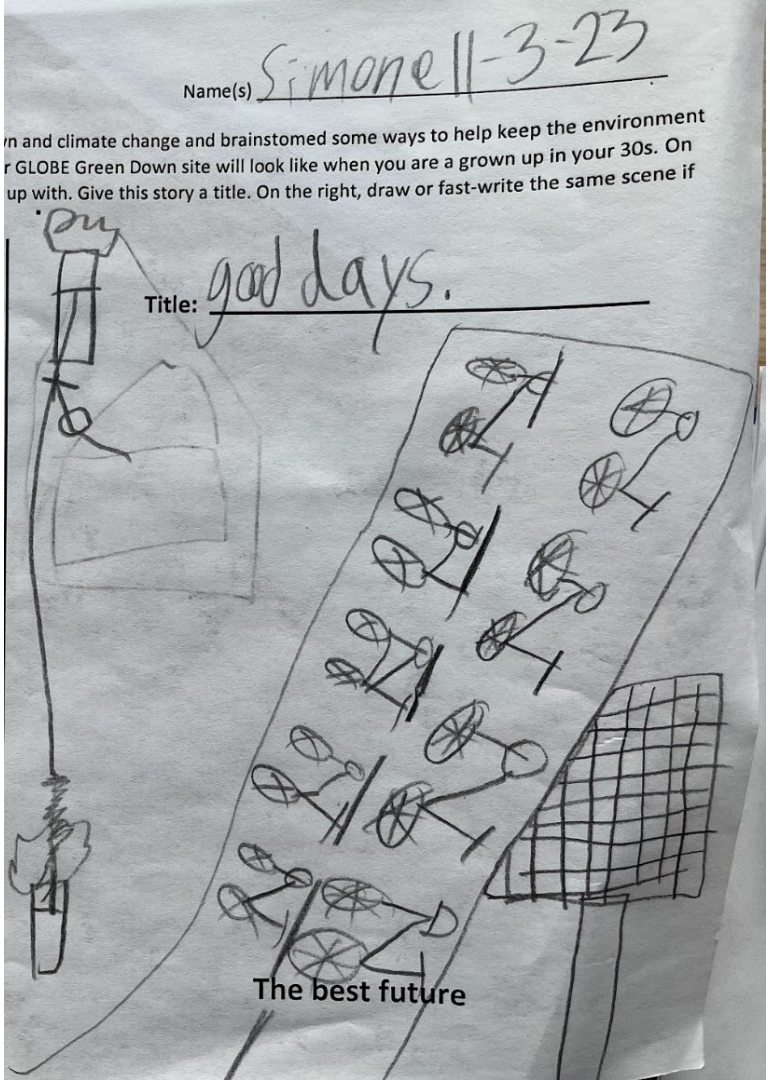
Brainstorm Sheet **Name(s)** _____

How do we get to the best berry future?

Imagine you have graduated from high school. What are the sorts of things you or other people could be doing to try to make sure berries are around and in good condition for the future? New technology? New berry crops? New data or information? New laws?

Make a thinking map with your ideas. Write one idea in each bubble.

Rewrite the future where you have taken one or more of these actions.



Prioritizing actions

FUTURE

Turning GLOBE Data into Climate Action for the Future

FUTURE

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FUTURE

Turning GLOBE Data into Climate Action for the Future

Alaska delegation to the Pacific and NW Regional Student Research Symposium
NASA Jet Propulsion Laboratory, Pasadena, California, May 2024

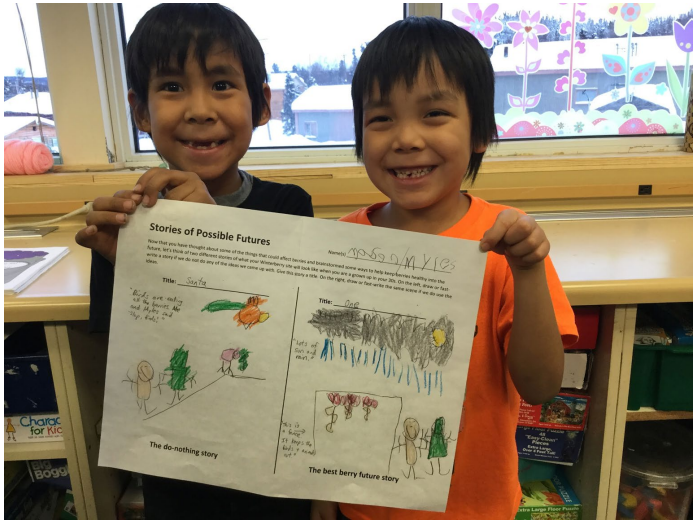
Through GLOBE observing
and by imagining the future,

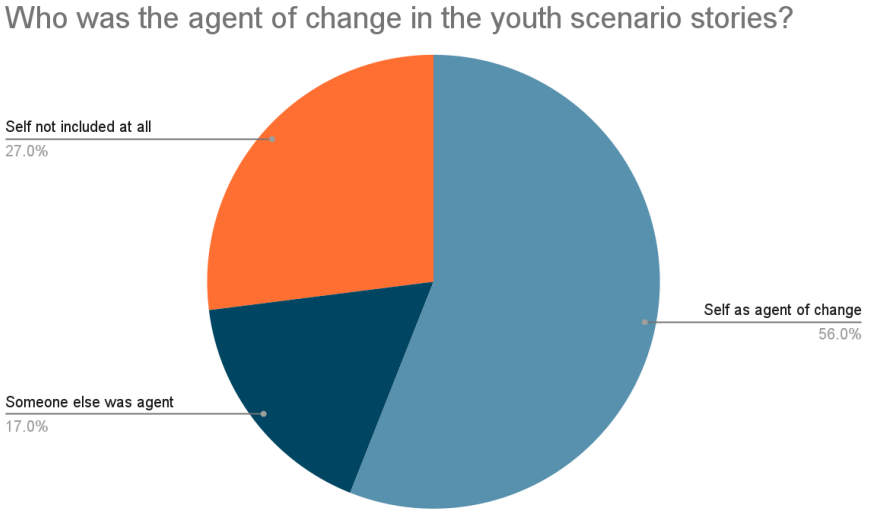
we change ourselves.

Key Findings

Storytelling improved science and stewardship self efficacy.

Key Findings - Youth Work





Rural youth were more likely to picture themselves as agents of change than urban. No difference across ages

Spellman, Cost and Villano (2021) *Frontiers in Ecology and Evolution*

Key Findings - Retention

- 92% of youth groups in storytelling group continued for a second year
- 70% continued for 3 or 4 years and joined other programs

Spellman, Cost and Villano (2021) *Frontiers in Ecology and Evolution*

Key Findings - Educator Interviews

Value to youth -

1. Sense of being a part of something bigger
2. Connected CitSci to culture and community
3. Chance for youth to use and apply data
4. Positive thinking about the future

Value to practice -

1. Physical presence of a scientist and mentor
2. Tangible results, hands-on and made climate change relatable
3. Connected with youth group learning priorities -informal and formal learning
4. Interdisciplinary- easy to connect with many aspects of ongoing learning

Spellman, Cost and Villano (2021) *Frontiers in Ecology and Evolution*

Through GLOBE observing we change the world

2023-24 GLOBE Year of Climate and Carbon Green Down leaf phenology observations

GLOBE observations tell the story of our past,

and can help create the story of our future.

HOPE

Contact details

WEBSITES

https://sites.google.com/alaska.edu/winterberry/

www.arcticandearthsigns.org

UAF IRB Approval #1062412-5

FUNDING

National Science Foundation Awards

- 1713156 (Arctic Harvest-Winterberry)
- 1636476 (Bonanza Creek LTER)

NASA Science Activation

- No. NNX16AC52A (Arctic and Earth SIGNs)

Presenting Authors

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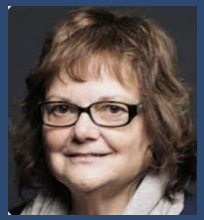

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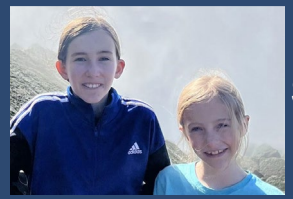

Izzy Spellman, 11
Simone Spellman, 9