

# Connecting Graduate Students, Research and K-12 Students Through Online Outreach: Making the Most of Online Learning During Covid-19

BRENDEN FISCHER-FEMAL, SAMUEL LOPEZ, HANNAH HARTLEY, AND  
HOLLY GODSEY

---

UNIVERSITY OF UTAH COLLEGE OF MINES AND EARTH SCIENCES, GEOLOGY & GEOPHYSICS



**GEOLOGY & GEOPHYSICS**  
MINES AND EARTH SCIENCES | THE UNIVERSITY OF UTAH

# Williamson Fellowship

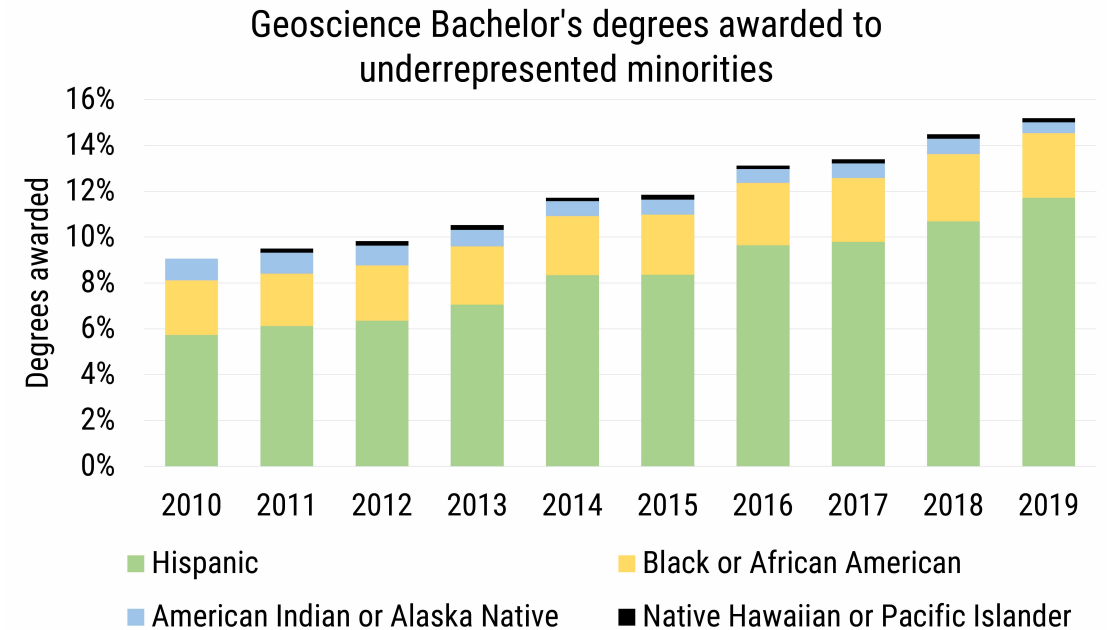
Funded through generous donors, Chuck and Cathy Williamson

Connects graduate students to local schools, encourage diversity in geosciences

- Generally important for geosciences to do this, not enough geoscience in education system, esp. in underrepresented diverse populations

In the past, in person visits to schools weekly

This year, that wasn't possible, so time to innovate and come up with something different!



Credit: AGI, data derived from IPEDS

# People

---



Sam Lopez, PhD Candidate  
Research Focus: Methane  
cycling in the Great Salt Lake



Hannah Hartley, PhD  
Candidate  
Research Focus: Lake Powell  
sediments



Dr. Holly Godsey, Associate  
Professor  
Director of Student Success &  
Teacher Development, College of  
Mines and Earth Sciences

# 3-Minute Videos Introduction

Short and fairly easy to digest

General “why should we care about your research”

Great Q & A

- How is calcium carbonates formed on our soil? Is there an easy non-polluting way to produce it?
- What were the first steps you noted that made you want to study climate change and what have you done so far to help this problem of climate change?

Sustainable Earth Scientist 3-minute video submission  
([sustainableearthscientist.org](http://sustainableearthscientist.org))

Dr Angus McCoss



Hannah Hartley | Lake Powell Deltas



Sam Lopez  
PhD Student, University of Utah

Sustainable Earth Scientist - Sam Lopez

# Create Virtual Modules - Earth Cycles

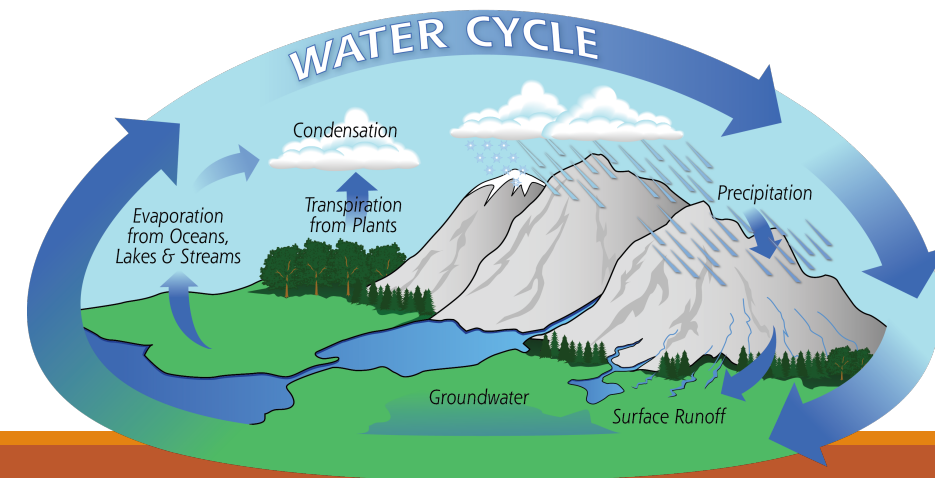
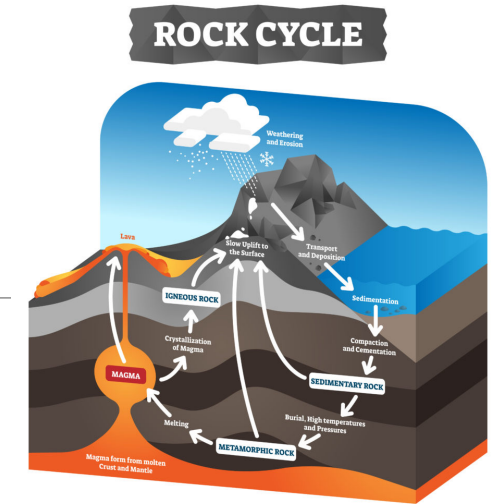
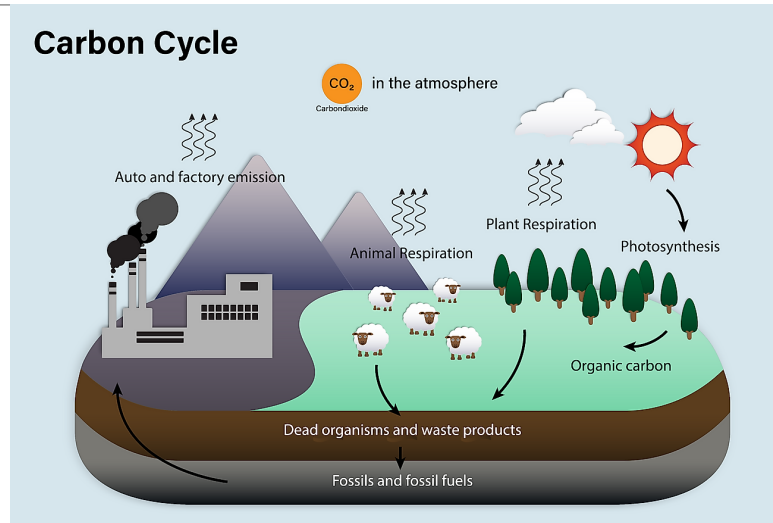
Fits in to the Utah Middle School curriculum guidelines

- Feature local Utah geology

3-day modules that can be in-person or **virtual**

Utilize virtual educational tools

Freely available on the Utah CMES website

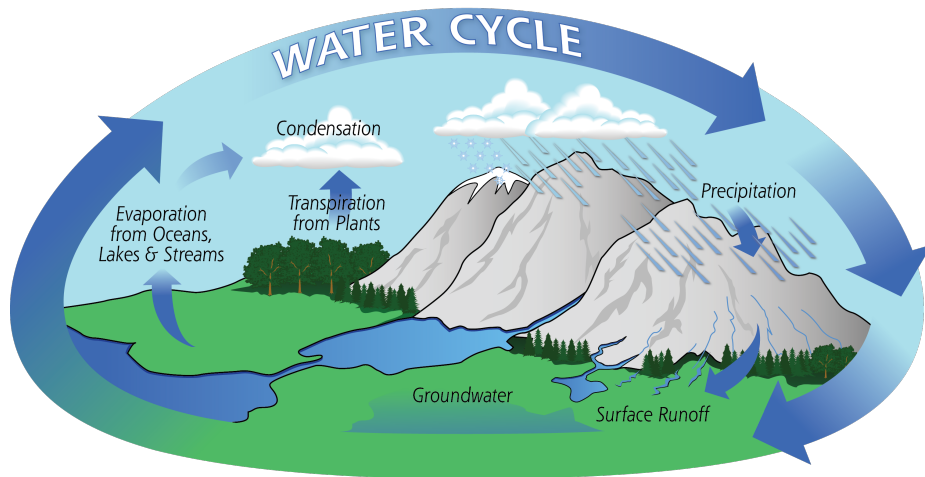


# Water Cycle – Sam Lopez



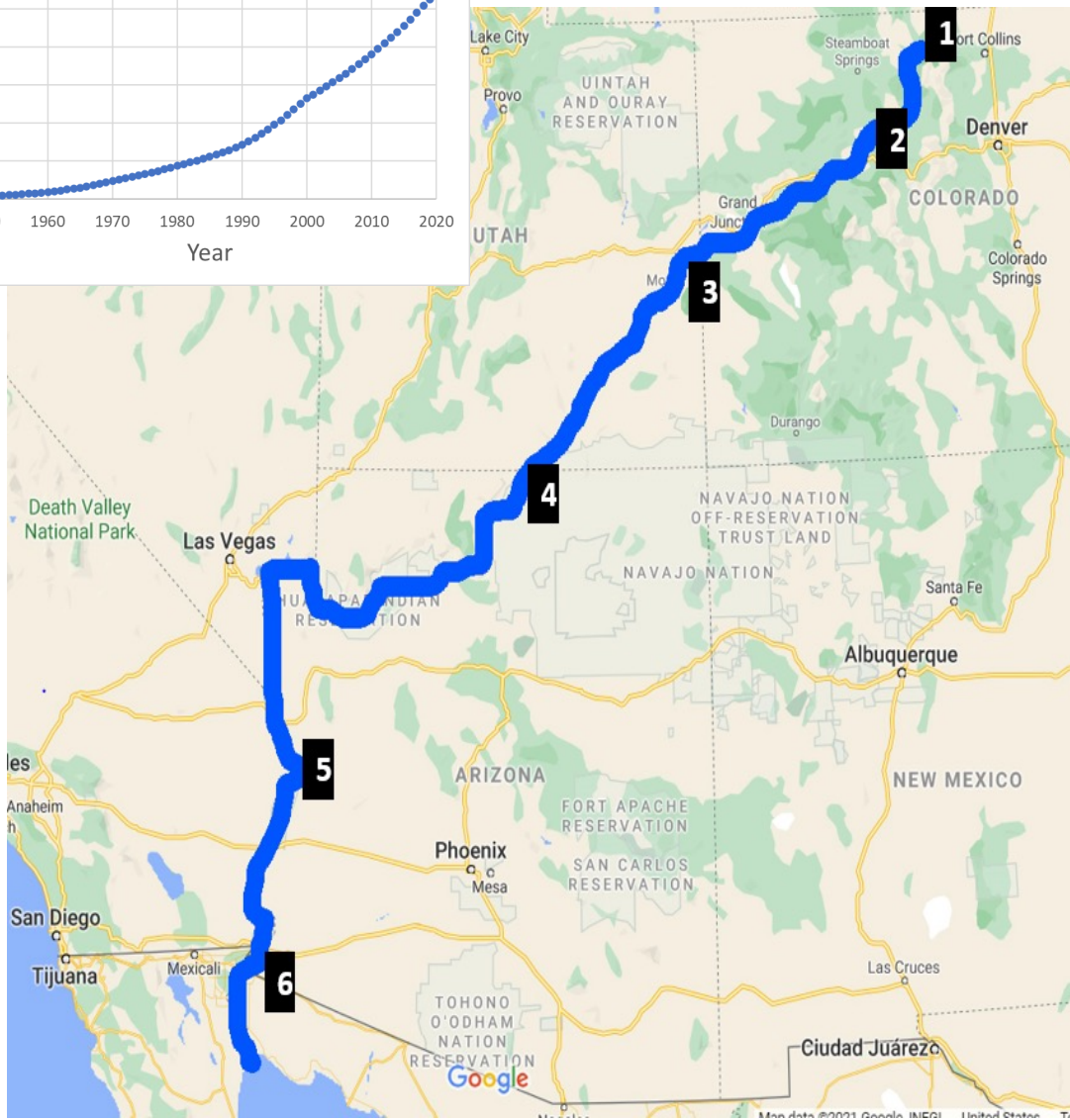
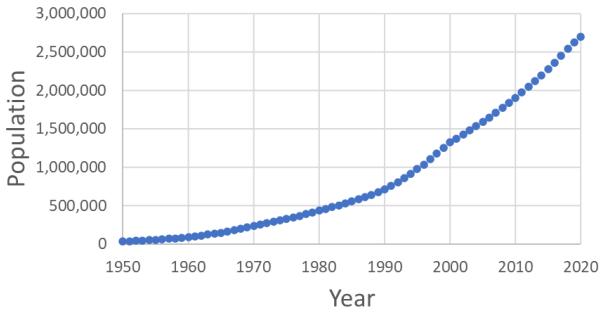
## Features:

- Jeopardy game
- Local watershed mapping
- Google Maps

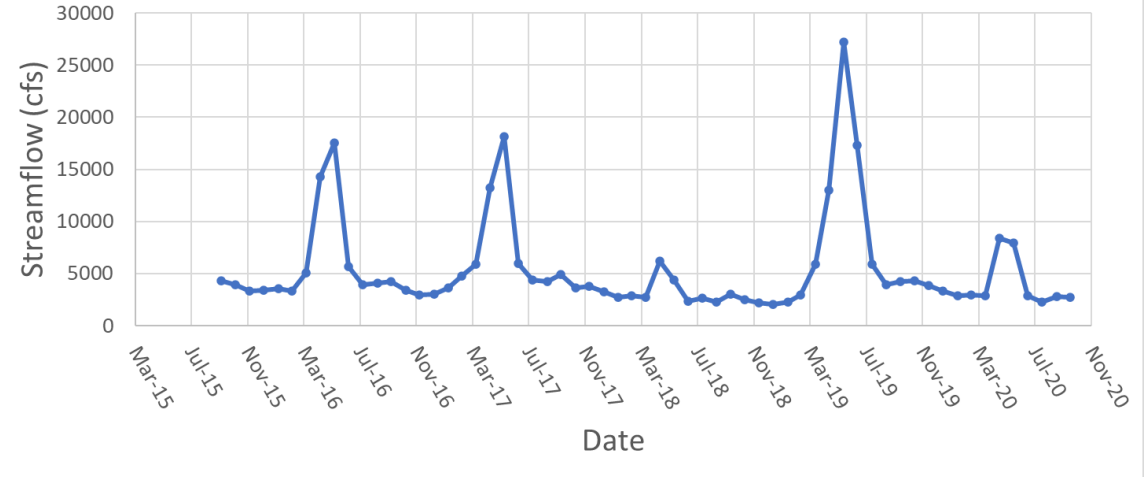


Definitions	Multiple Choice	True/False	Picture perfect!	What's the matter?	Miscellaneous
<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
<u>200</u>	<u>200</u>	<u>200</u>	<u>200</u>	<u>200</u>	<u>200</u>
<u>300</u>	<u>300</u>	<u>300</u>	<u>300</u>	<u>300</u>	<u>300</u>
<u>400</u>	<u>400</u>	<u>400</u>	<u>400</u>	<u>400</u>	<u>400</u>

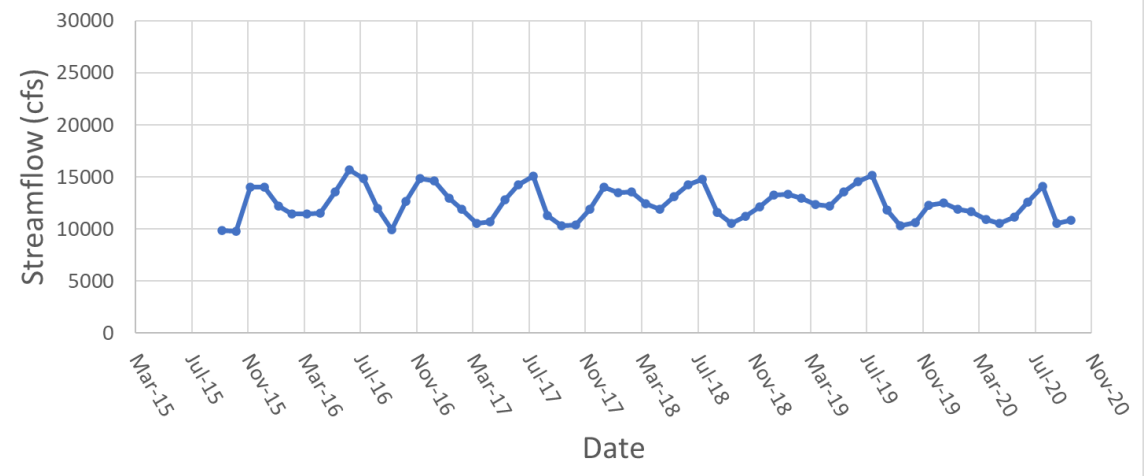
Las Vegas Metro Area



3. Utah-Colorado State Line



4. Lees Ferry, AZ



# Rock Cycle – Hannah Hartley

---

Features:

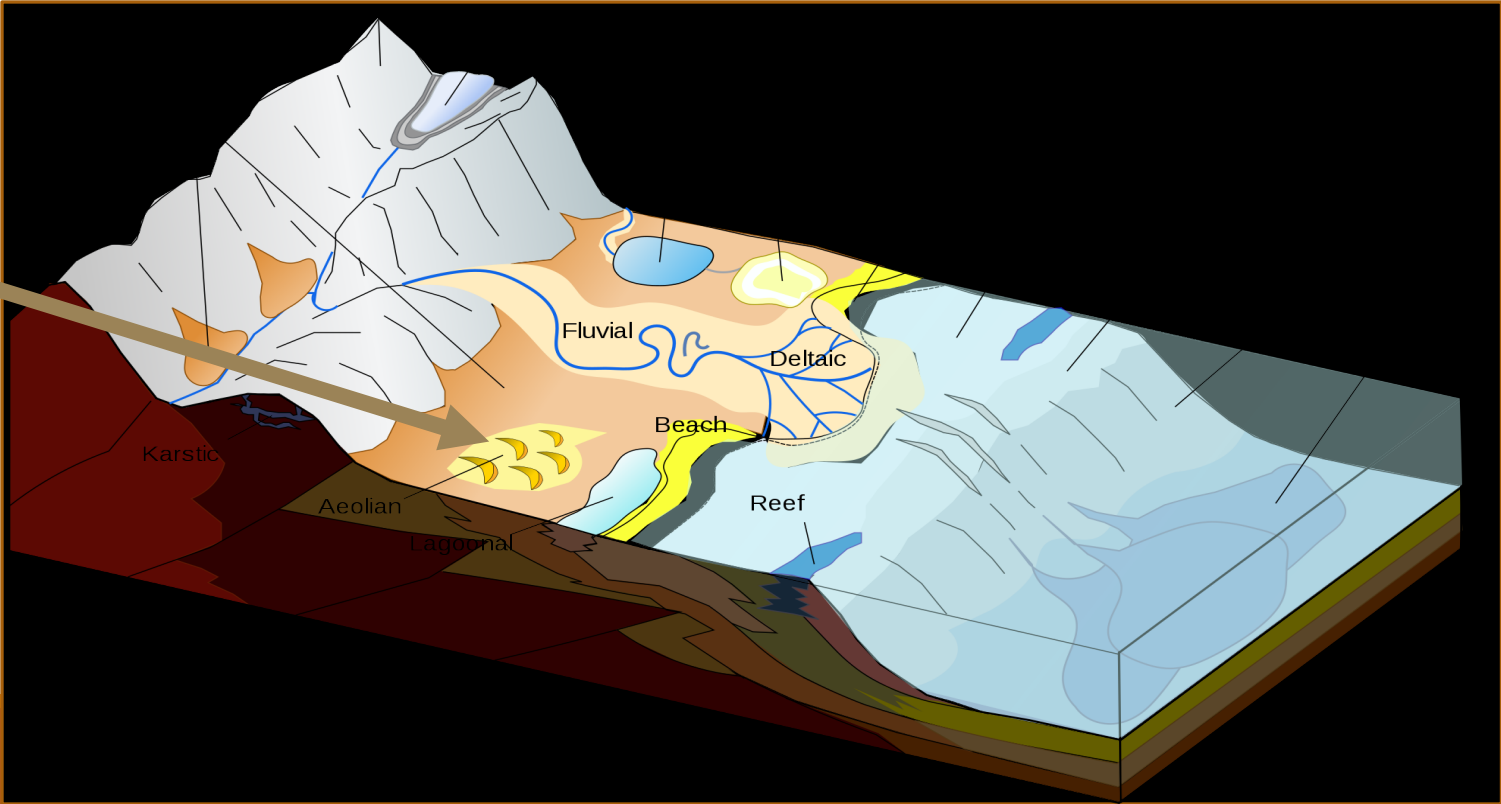
- Virtual road trip through Utah's National Parks
- Virtual rock ID
- Sedimentary system learning with playdough





# Rock Cycle – Hannah Hartley

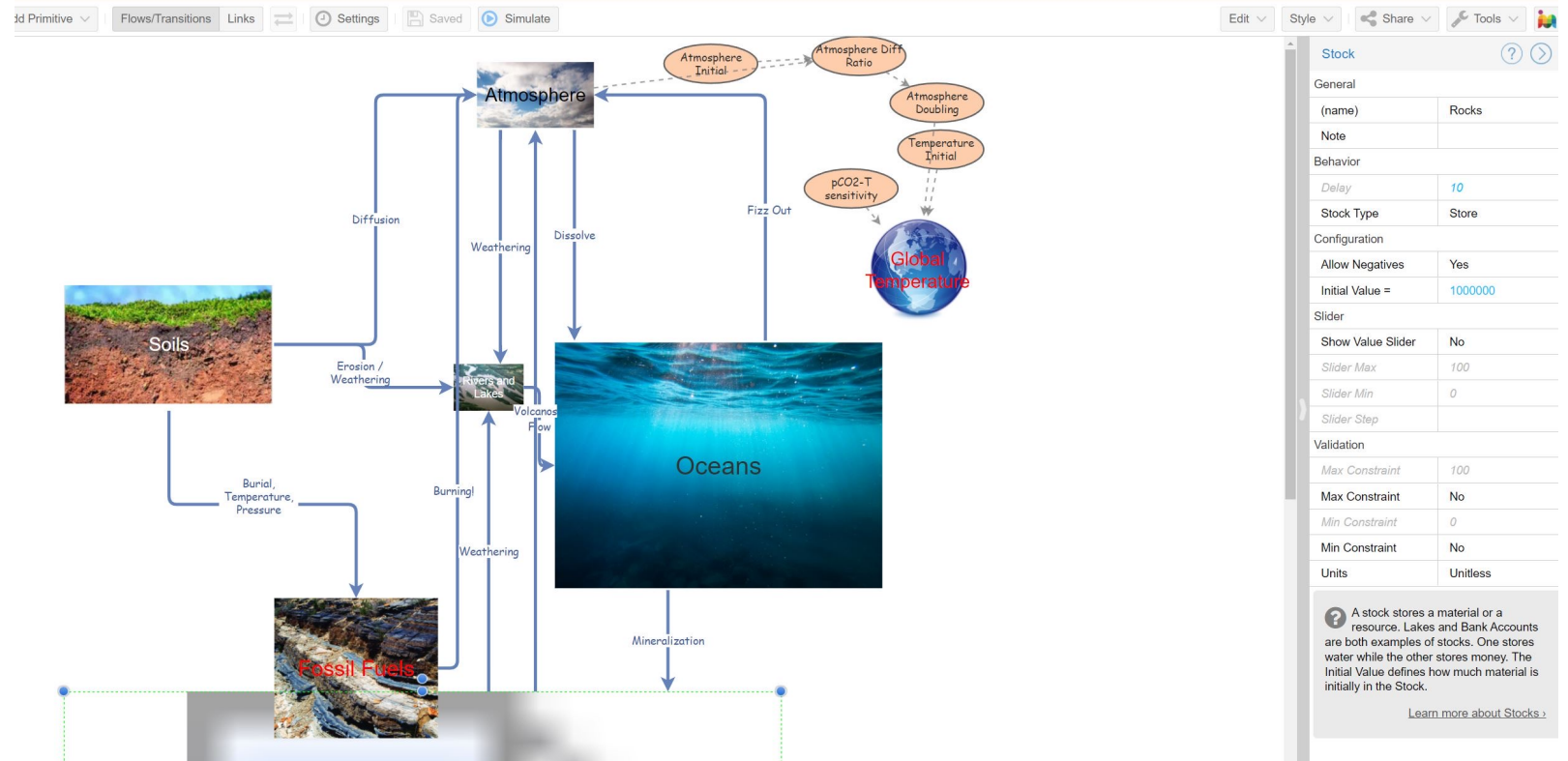
---



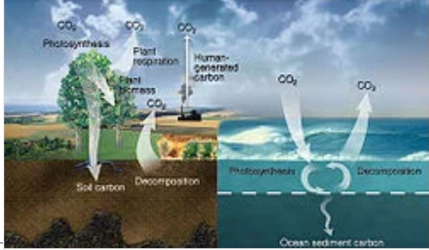
# Carbon Cycle

## Features:

- CO<sub>2</sub> chamber heating experiment
- Kahoots, Nearpod, and InsightMaker learning tools
- Making your own carbon cycle model



# Carbon Cycle



The diagram illustrates the carbon cycle with various processes and carbon reservoirs. Processes shown include Photosynthesis (CO<sub>2</sub> uptake), Plant respiration (CO<sub>2</sub> release), Human-generated carbon (CO<sub>2</sub> release), and Decomposition (CO<sub>2</sub> release). Reservoirs include Soil carbon, Ocean sediment carbon, and Ocean carbon. Arrows indicate the flow of carbon between these components.


**Kahoot! Carbon Cycle - Review**  
0 favorites 4 plays 84 players  
Play Edit

A public kahoot  
Quick Review on the Carbon Cycle  
femalbrenden  
Created 5 months ago


**Questions (11)** [Show answers](#)

- 1 - Quiz  
Forests are good places to store carbon  
 True  False
- 2 - Quiz  
What role do the oceans play in the carbon cycle?
- 3 - Quiz  
Have the oceans been a NET source or sink of carbon? Or neutral?
- 4 - Quiz  
When carbon goes into the ocean, what happens?
- 5 - Quiz  
How much human-caused CO<sub>2</sub> have land plants have taken out of the air in recent decades?

Slide 9 / 11



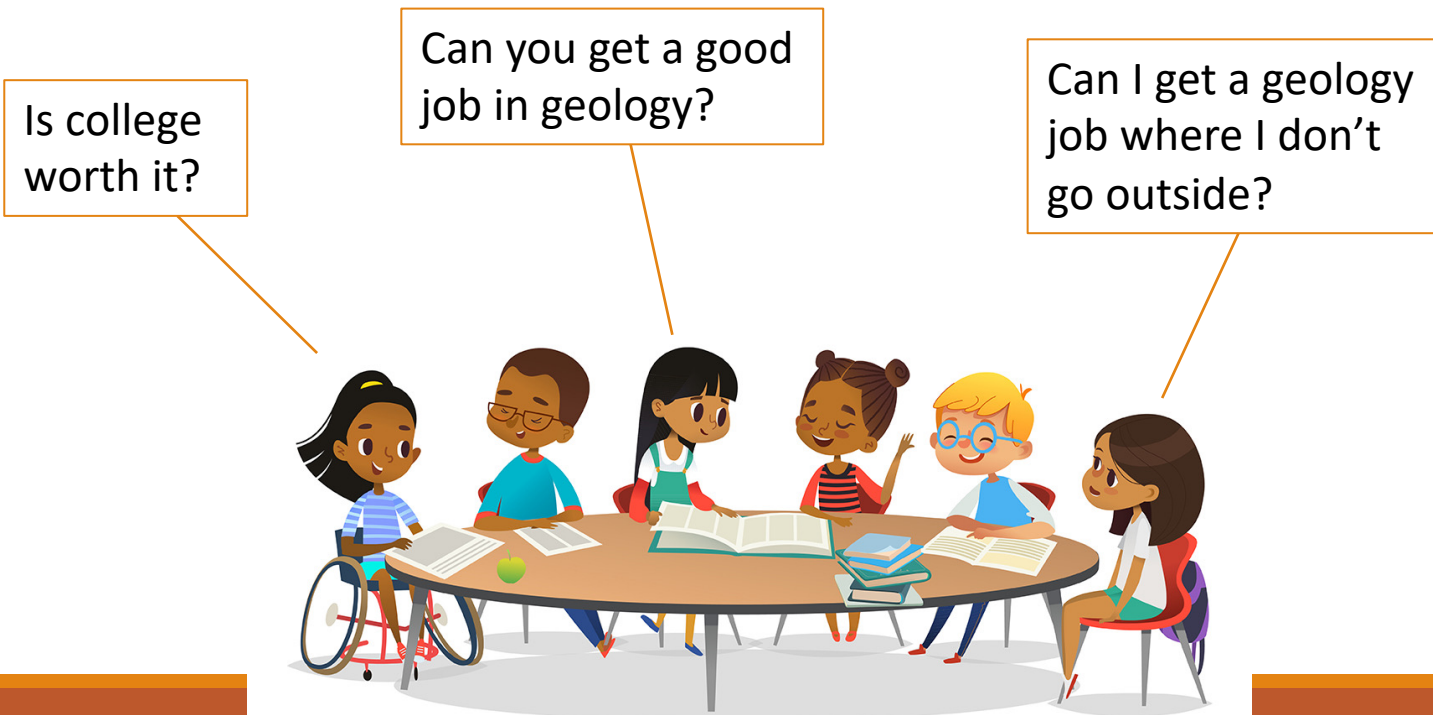
What Should Our First "What if" Question be?

Share thoughts and/or images here 250 

# Virtual Ambassadors of (Geo)Science

---

Have to build in time for general questions, which often comes naturally in-person



# Final Thoughts

---

2 Title 1 Schools, 3 Fellows, 6 Teachers, 800 Students

Geoscience education can utilize many virtual tools, but can be time consuming to create

Local geology / hydrology helps make connections, even virtually

Improvements and the coming year

- Working on field trips of local geology
- Bryant Middle School teacher Tommy Good, PhD students Sam Lopez and Jeremiah Bernau



# Acknowledgements

---

## Teachers:

Tommy Good

Elizabeth Moretz

Sydney Stringham

Brittany Dame

Joshalynn Marino

Niki Hack



## Financial Support:

Chuck and Cathy Williamson

## Feedback and Input:

Marjorie Chan

Thure Cerling

Courtney Wagner

## Staff:

Nicholas Bolerjack

Kayleigh Kirkpatrick

Shanna Futral



**GEOLOGY & GEOPHYSICS**

MINES AND EARTH SCIENCES | THE UNIVERSITY OF UTAH