

# GEOSCIENCE METHODS AND LOCAL GEOLOGY

Urban Teachers Engage in Authentic Experiences to Make Sense of Local Phenomena

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Earth Educator's Rendezvous July, 18, 2017



# PRESENTATION OBJECTIVES

- Briefly explain structure of the S<sup>3</sup>ETS Program
- Illustrate the importance and power of K-12 partnerships
- Hi-light the outcomes of a local in-service teacher experiential professional development
- Inspire others to create similar programs in their local areas

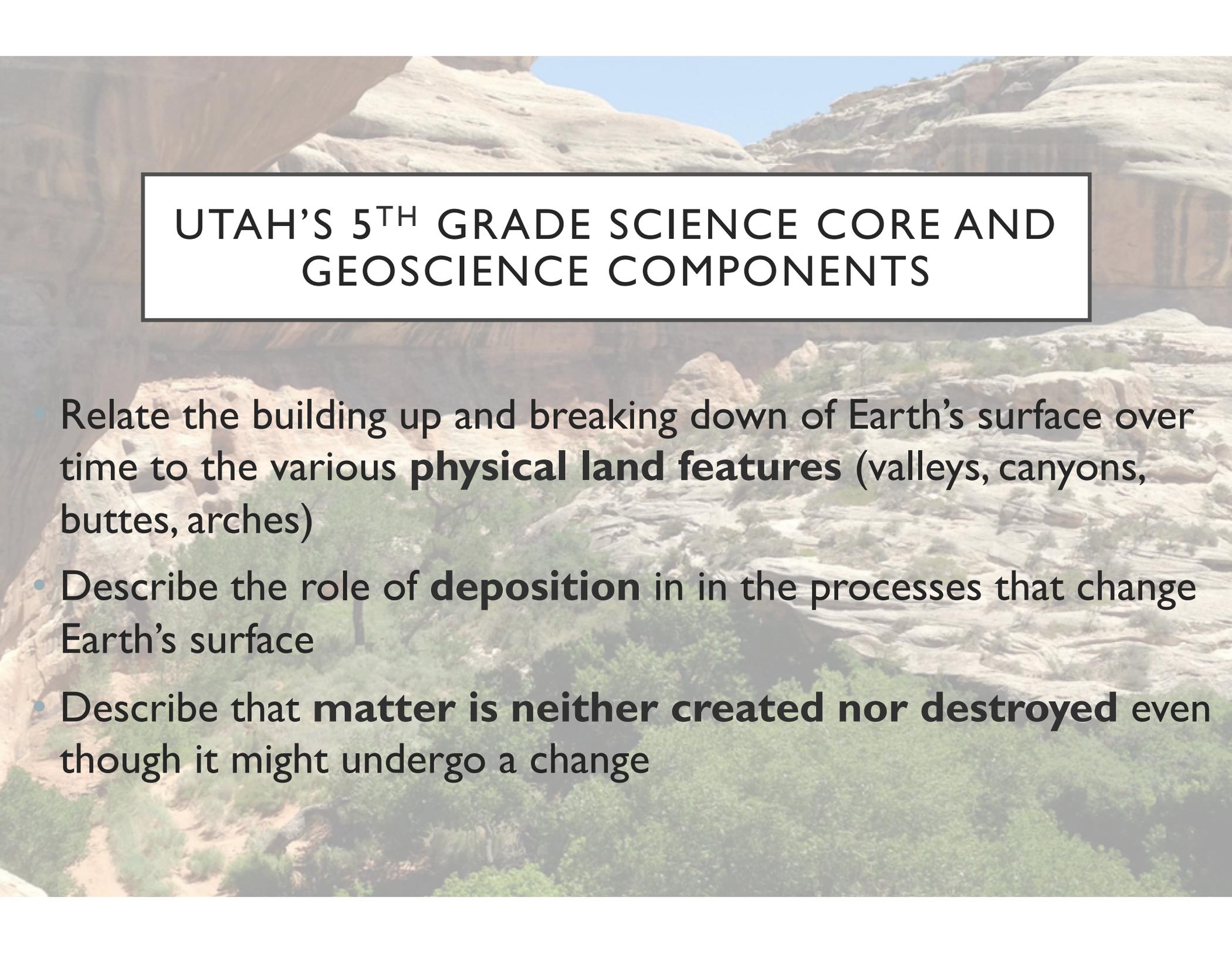


## MATH-SCIENCE PARTNERSHIP GRANT S<sup>3</sup>ETS PROGRAM

- University of Utah's Genetic Science Learning Center
- Salt Lake City School District (~24,000 students)
- Focused on teacher content knowledge and best practices
- K-12 Framework for Science Education

# MATH-SCIENCE PARTNERSHIP GRANT S<sup>3</sup>ETS PROGRAM

- Three year grant (2015-2018)
- Monthly professional development session (16 hours total)
- Monthly coaching episode with teacher
- Summer workshop (40 hours)
- Teacher Stipend \$1,400



## UTAH'S 5<sup>TH</sup> GRADE SCIENCE CORE AND GEOSCIENCE COMPONENTS

- Relate the building up and breaking down of Earth's surface over time to the various **physical land features** (valleys, canyons, buttes, arches)
- Describe the role of **deposition** in the processes that change Earth's surface
- Describe that **matter is neither created nor destroyed** even though it might undergo a change

# PHENOMENON #1: GRAVEL PIT AT TRAVERSE MOUNTAIN

LAKE BONNEVILLE SHORELINES

“POINT OF THE MOUNTAIN”



# MAKING OBSERVATIONS



GK GILBERT 1890

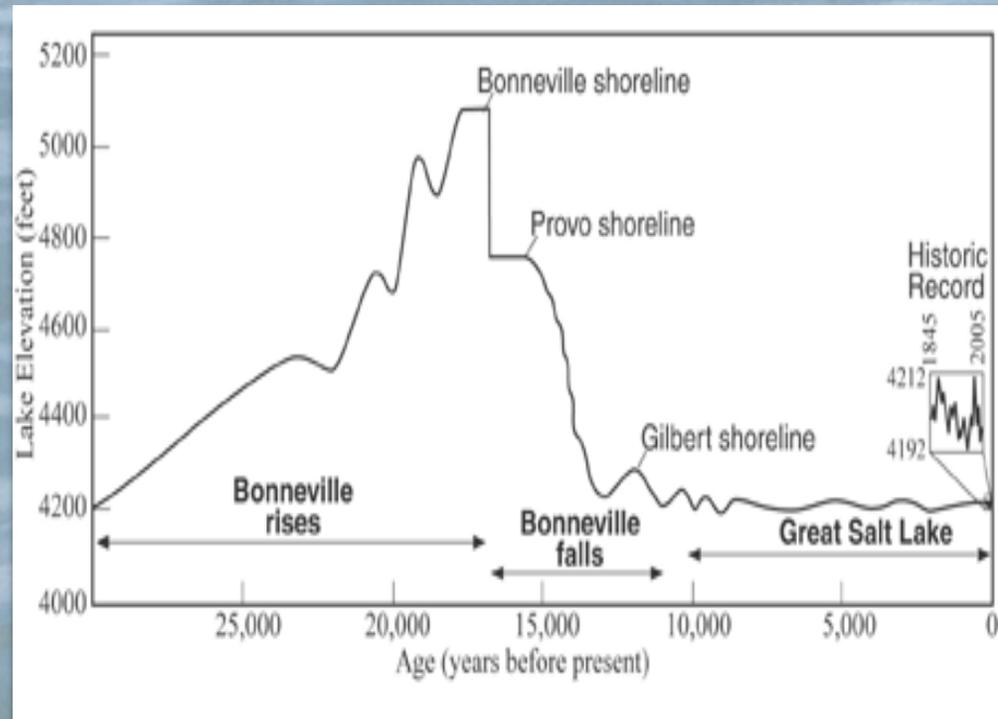


TEACHERS

RECOR  
DAT



# OBSERVATIONS OVER TIME AND SPACE



PALEO-LAKE BONNEVILLE- FLUCTUATIONS OVER TIME AND SPACE RESULT IN VARIED SHORELINES

MODERN GREAT SALT LAKE

# CONNECTING WITH LOCAL LANDFORMS & ENVIRONMENT

“I FEEL LIKE MY GREATEST AREA OF GROWTH WAS  
MY UNDERSTANDING OF GEOLOGY AND LAKE  
BONNEVILLE.

I KNOW THAT BECAUSE WHEN I TAUGHT IT TO MY  
STUDENTS, I WAS ABLE TO EXPLAIN MORE OF THE  
CONCEPTS WITH CONFIDENCE AND ANSWER  
THEIR QUESTIONS.”

LOCAL TEACHER

.”



# PHENOMENON #2: V-SHAPED CANYON VS U-SHAPED CANYON

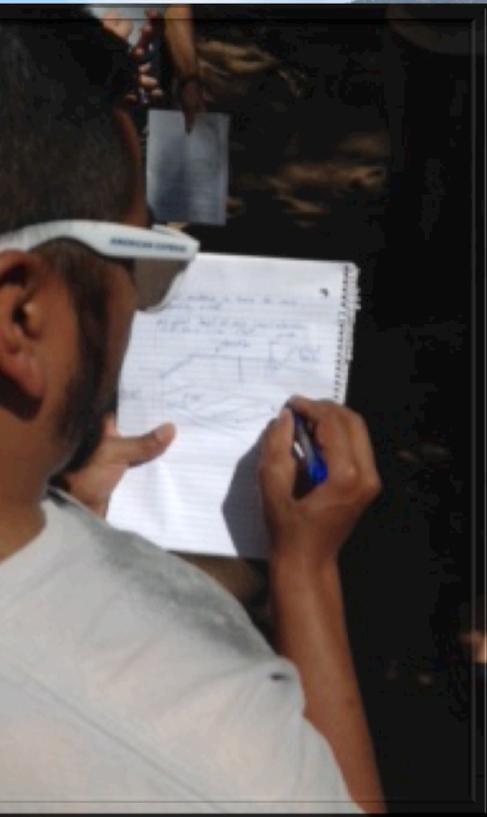
BIG COTTONWOOD CANYON



LITTLE COTTONWOOD CANYON



# OBSERVATION AND HYPOTHESES



RECORDING DATA

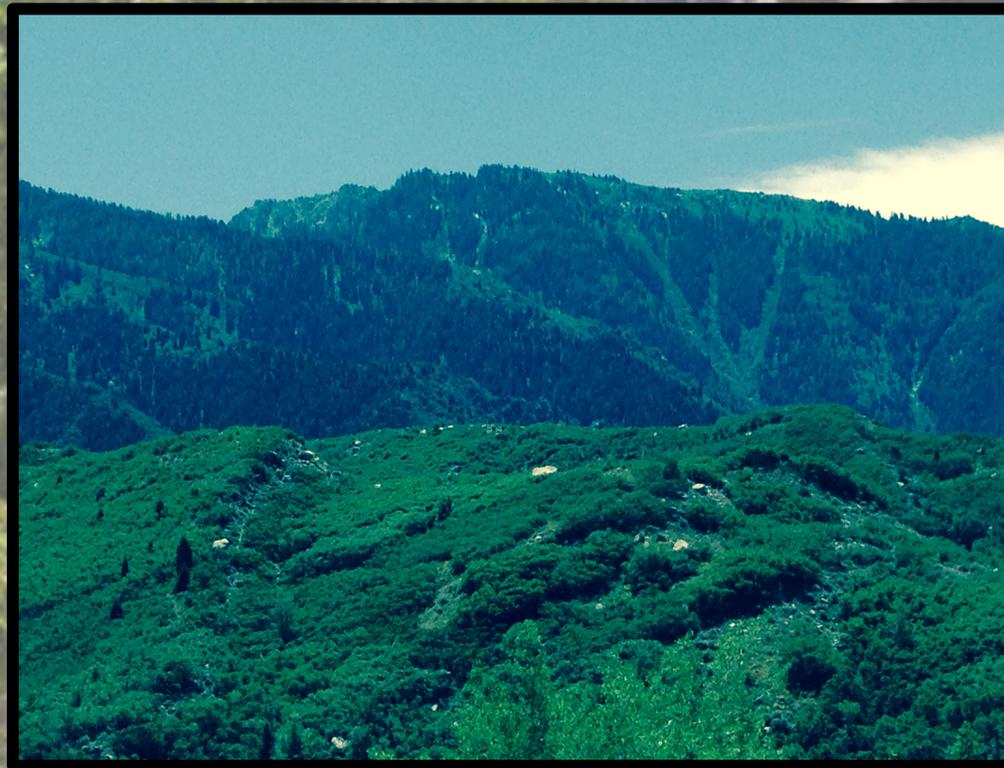
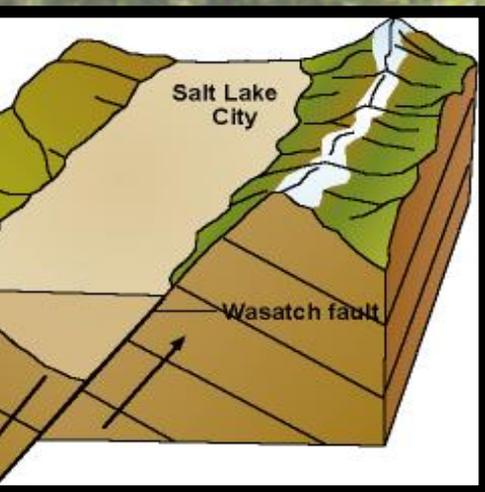


HIGH ENERGY STREAM AND STEEP  
CANYON WALLS  
BIG COTTONWOOD CANYON



# DATA ANALYSIS AND MODELS

ING MODELS TO  
MAKE  
NSE OF LOCAL  
LANDFORMS



LOCAL LANDFORM



DATA ANALYSIS

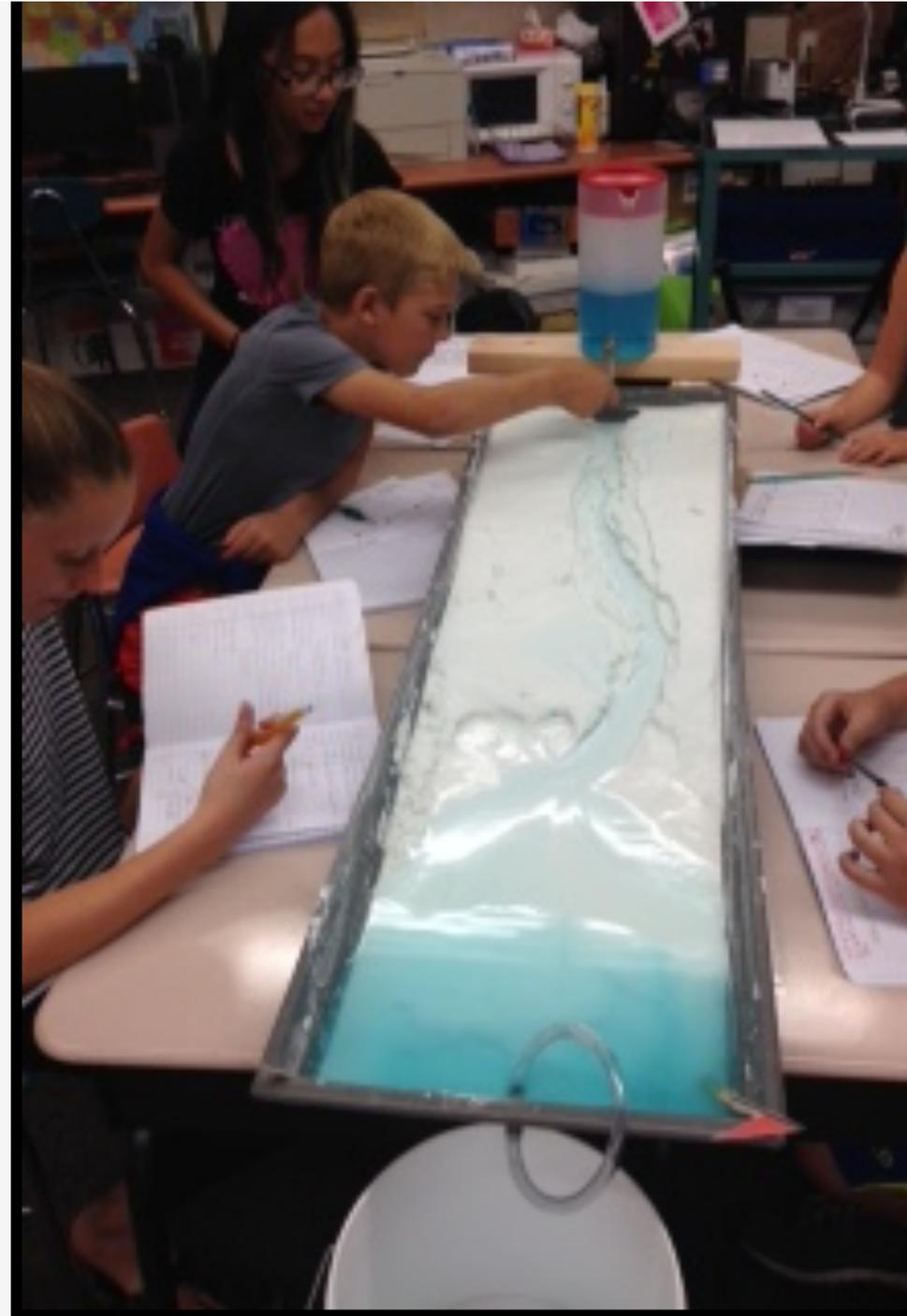
## PROGRAM IMPACT

- **“The session that impacted me the most was when we went up to the Big and Little Cottonwood Canyons. It was very meaningful to me. I was able to take all that experience back to my classroom, and able to explain a lot better the land formations concepts to my students. Especially teaching about erosion and how the "U" and "V" shape canyons formed.”**

• **5<sup>TH</sup> GRADE TEACHER**

# PROGRAM IMPACTS- TEACHER CONFIDENCE & STUDENT LEARNING!

...not from here and I  
...the experience helped  
...in a better  
...standing for things  
...Utah. This  
...standing is helpful in  
...g concepts taught in  
...h grade core about  
...g earth.”  
5<sup>TH</sup> GRADE TEACHER



## CLOSING THOUGHTS....

- “ Earth's Surfaces/Landforms content and instruction was my least favorite standard and the hardest to teach. Now it is, by far, my favorite. I know because I love teaching it, and my kids loved learning about it, and it set them up to really love science in my classroom. But the student interim scores really showed a big jump as well. My last group of 5th graders had a class percent correct of 60%. My current 5th grade class had a class percent correct of 78% for Standard 2.” UTAH 5<sup>TH</sup> GRADE TEACHER

A scenic view of a canyon with layered rock formations and green vegetation. The image shows a wide canyon with high, layered rock walls. The rock has distinct horizontal bands of different colors, from light tan to dark brown. The canyon floor is filled with lush green vegetation, including trees and shrubs. The sky is a clear, bright blue. A white rectangular box with a black border is centered in the middle of the image, containing the text "THANK YOU!".

**THANK YOU!**