

INTENDED LEARNING OUTCOMES for Earth Science Outside – LANDFORMS of the Wasatch Front.

– Preview of the workshop goals... we'll go over this the first day of class.

- (1) By the end of just one of the three July 2017 Earth Science Outside workshops, NRC Framework for K-12 Science concepts should be familiar.
- (2) By the end of the LANDFORMS workshop, teachers will know by heart the seven cross cutting concepts of the framework and embrace them as ways to interest students in Earth science. Embrace them? We hope so. The LANDFORMS that surround us are an accessible way to teach the new Utah science curriculum (SEEd).
- (3) By the end of the LANDFORMS workshop, the three broad headings of disciplinary core ideas and their sub-sets should make sense as a framework. The LANDFORMS workshop will focus on Earth and Space Sciences, one of the four scientific disciplines of the NRC framework.
- (4) By the end of the LANDFORMS workshop, the disciplinary core ideas Earth's Systems should make sense as a framework. Teachers will be able to see expressions of its 15 sub-statements along the Wasatch Front.
- (5) By the end of the LANDFORMS workshop, teachers will be able to create 3-D thinking maps for phenomena along the Wasatch Front and teach with confidence three specific disciplinary core ideas within Earth's Systems:
 - Plate Tectonics and large-scale interactions, including contrasts of Utah's three regions based on landforms. Teachers should embrace the concept that Tectonics Rules! It sets the stage for other processes.
 - The Role of Water in Earth's surface processes, including erosion, transport and deposition not only by water but by all five agents of geomorphic change. Geomorphology is the subdivision of Earth science that studies the processes that affect landforms.
 - The Role of Weather and Climate in Earth's surface processes, specifically the role of Utah's weather and climate of the past 35,000 years and consequences to landforms of the Wasatch Front. These include shorelines of Lake Bonneville and glacial features of our mountains.
- (6) In addition, by the end of the LANDFORMS workshop, teachers will have explored concepts of sense of direction and sense of place. They will have the skills to inspire their students to pay attention to their surroundings deliberately using the seven cross-cutting concepts of the K-12 Framework. Those crosscutting concepts are:
 1. Patterns
 2. Cause and effect: Mechanism and explanation
 3. Scale, proportion and quantity
 4. Systems and system models
 5. Matter and energy: flows, cycles, and conservation
 6. Form and purpose
 7. Stability and change