

INTENDED LEARNING OUTCOMES

for Earth Science Outside –
ROCKS and MINERALS of the Wasatch Front.

- (1) By the end of just one of the three July 2017 Earth Science Outside workshops, the Framework for K-12 Science concepts should be familiar. The Framework is 3-D. The thinking map for teachers is 3-D... the same dimensions.
- (2) By the end of the ROCKS AND MINERALS workshop, teachers will know by heart four of the seven cross cutting concepts of the framework and embrace them as ways to interest students in Earth science. Embrace them? Hope so! The ROCKS AND MINERALS that surround us are an accessible way to teach the new Utah science curriculum (SEEd).
- (3) By the end of the first day of the ROCKS AND MINERALS workshop, the four disciplines of the sciences (of the Framework) should be familiar. The ROCKS AND MINERALS workshop will focus on Earth and Space Sciences. The others are... (Quiz yourself!)
- (4) By the end of the ROCKS AND MINERALS workshop, the framework of the disciplinary core ideas (DCI) for **Earth's Systems should make sense**. Teachers will be able to recognize expressions of their 15 components along the Wasatch Front.
- (5) By the end of the ROCKS AND MINERALS workshop, teachers will be able to create 3-D thinking maps for their class planning. Teachers will be able to use diverse “phenomena” they witness along the Wasatch Front and to teach ROCKS and MINERALS outside. Specifically, teachers will be able to teach aspects of these three disciplinary core ideas with confidence, outside:
 - *Earth Materials and Systems*, including the two great driving forces of energy: energy that comes from the sun that drives processes on the outside of Earth, and energy from Earth's interior that drives processes of tectonics.
 - *The Roles of Water in Earth's surface processes*, because water is impressive in its properties and effects. Teacher will understand water erosion, transport and deposition, and also its dissolution of minerals for example those that become salts of Great Salt Lake.
 - *Earth and Human Activity: Natural Resources*, specifically the cause and effects of Utah's remarkably diverse energy and mineral resources.

(6) In addition, by the end of the ROCKS AND MINERALS workshop, teachers will have developed skills to inspire students to pay attention to their surroundings 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***