

## Erosion as War

*Boys and girls I want to tell you about a war. There's a horrible, violent war being waged – right now – outside our classroom window in fact. The two sides of the war battle endlessly – tirelessly – without rest. The participants on one side try to stand strong – to be firm in the face of their enemy – to resist certain destruction. But the other side is too strong – too persistent – ruthlessly aggressive and amazingly strong. This side will prevail, in fact, they always prevail. The casualties of this war are all around us – horribly disfigured, in some cases, beyond repair. Do you want to see some of the casualties of this war? I caution you, the images are powerfully disturbing.*

Here, full color posters of the Grand Canyon, a coastal seascape, and an alpine/glacial scene were shown to students. The point is, of course, that erosion is all around us and can be imagined as a battle between the forces that cause erosion and those objects and landforms that try (without agency, of course), in vain, to resist erosion. The metaphoric lens of “the battle” framed the instructional unit and the presentation was crafted using richly descriptive and highly imaginative language. Students were drawn into the engagement with the metaphor in a way that created drama and wonderment.

Next, students were asked to “work the metaphor” of “battle.” They identified the players in the battle (forces of erosion and objects that resist erosion), the “weapons” used (wind, waves, rain, glaciers, rivers and so on) and the “casualties” of the war (canyons, beaches, valleys, sediments and so on). After an extended analysis of the metaphor the class took a short fieldtrip around the outside of the school building looking for evidence of the battle. At the conclusion of the instructional day students were challenged to search out evidence of the battle, describe the battle to someone else, and try to help another see the world through the lens of the metaphor. Upon returning to class the following day students reported their experiences “personalizing” the metaphor and verifying its utility in their own world. The stories told were amazing and extent to which students sought out connection to science ideas was amazing. However, up until this point, not a single “science word” had been used! Students had been learning science for two days without the language found in textbooks or on standardized tests. This was necessary to build a framework of perception and engagement but led to the need to adopt more scientific language.

Students exited the unit with an understanding of the following three central scientific ideas: a) erosion is a naturally occurring process that never stops and affects all objects, b) we can do things to slow erosion or to minimize its detrimental effects, and c) erosion can, at times, play a positive role as in soil production. These are, word for word, the science curriculum goals for studying erosion in this elementary school.