

Experiments in *Discovering Design with Earth Science*

Discovering Design with Earth Science is a new late middle school/early high school course written by Dr. Jay Wile. Laboratory exercises are integrated into the course and are designed to illustrate many of the concepts that are discussed. In order to do the vast majority of the laboratory exercises, a specially-designed kit is required. It costs only \$70 and includes many items, including specimens of specific minerals, rocks, and fossils, specimens of various sediments, a digital mass scale that is accurate to 0.1 grams, a graduated cylinder, a hand lens, a magnet, etc. With this kit, the student can perform a total of 56 experiments that are scattered throughout the 16 chapters of the course.

Many of the laboratory exercises are very similar to what real earth scientists do. Students do hardness tests, streak tests, optical tests, and magnetic tests on minerals, and they then use what they learned to help them identify minerals in rock samples. They also do percolation tests on sediments, density measurements on rocks, and a heat capacity analysis. In addition, they perform detailed analyses of 5 fossils that are included in the kit (clam, brachiopod, shark's tooth, petrified wood, and crinoid stem).

In laboratory exercises related to the earth's hydrosphere, students explore the properties of waves, the Coriolis effect, the differences between freshwater and saltwater, and the way evaporation works. When they study weather, they explore air pressure, why temperature changes with altitude, how wind is made, what makes the sky blue, how raindrops grow in clouds, and why we sweat. In the laboratory exercises related to space, students learn how to do spectroscopy, how the sun maintains its size, and how we measure the distance to nearby stars.