

**Mineral Museum Field Trip and Classroom Curriculum Guide**  
**for the New Mexico**  
**2004 Science Content Standards, Benchmarks, and**  
**Performance Standards**

**Kindergarten – 4th Grade**

A trip to the Mineral Museum can help you meet NINE of the 2004 Science Benchmarks. Here's how:

**Strand I:** Scientific Thinking and Practice

**Standard I:** Understand the processes of scientific investigations and use inquiry and scientific ways of observing, experimenting, predicting, and validating to think critically.

**K-4 Benchmark I:** Use scientific methods to observe, collect, record, analyze, predict, interpret, and determine reasonableness of data.

**Museum:**

K-4: observe all of the same kind of mineral (for example, look at several quartzes or fluorites) and note the similarities or differences. We discuss crystal shapes and colors.

3-4: Record data with pictures & numbers. Draw a picture of quartz (six sides, comes to a point) or halite (cubic and see-through).

**Classroom:**

2-3: Use protractor to measure crystal angles (specimen from teaching kit).

3-4: Describe crystals measuring angles and using simple tools (penny, fingernail) to determine hardness.

**K-4 Benchmark II:** Use scientific thinking and knowledge and communicate findings.

**Classroom:**

K-4: Communicate observations: tell what you saw and remember and liked about the field trip.

2-4: Teamwork: have groups measure crystal angles and pool classroom data for all crystals.

**K-4 Benchmark III:** Use mathematical skills and vocabulary to analyze data, understand patterns and relationships, and communicate findings.

**Museum:**

K-4: Observe relative sizes & characteristics of objects: Salt dissolves on food and has a salty taste, coal is rock that we burn (is combustible), and rocks have different relative weights even if they are the same size. We often compare talc (light, dull looking and greasy feeling) and galena (heavy, metallic looking and very cold and smooth feeling).

**Classroom:**

Float pumice on water and describe its relative density to water (has to be lighter to float). You can pick up pumice on HWY 60 just before Box Canyon (about 5.5 miles west of Socorro).

**Strand II: Content of Science**

**Standard I (Physical Science):** Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy.

**K-4 Benchmark I:** Recognize that matter has different forms and properties.

**Museum:**

K-4: Minerals have different properties: colors, hardness, dissolve, burn.

1-4: Minerals can be transparent (gypsum), flexible (mica: muscovite & biotite), metallic (pyrite, galena).

2-4: Mineral properties change: salt dissolves in water or on food.

4: Atoms form the framework for crystals. This atom arrangement determines what the exterior shape of the crystal looks like.

**K-4 Benchmark II:** Know that energy is needed to get things done and that energy has different forms.

**Museum:**

3-4: Crystals refract, reflect & absorb energy. Students can observe opalescence in the opals and see labradorescence in the labradorite crystals in the lapidary display.

4: Energy is converted: We often discuss coal and what it is used for. Coal is mined, burned for heat, which turns water into steam, steam drives the turbines, which in turn drive the generators that generate electricity using magnets (you can make a generator using magnets and a wire coil in the classroom).

**Classroom:**

3-4: Crystals refract, reflect & absorb energy. You can use a large piece of optical calcite to show double refraction (light is split into two rays).

**Strand II: Content of Science**

**Standard II (Life Science):** Understand the properties, structures, and processes of living things and the interdependence of living things and their environments.

**K-4 Benchmark I:** Know that living things have diverse forms, structures, functions, and habitats.

**Museum:**

K-4: Observe the fossil displays. Fossils are grouped by phylum, so you can note the differences and similarities in members of the same phylum.

**K-4 Benchmark II:** Know that living things have similarities and differences and that living things change over time.

**Museum:**

K-4: Observe dinosaur bones, models, posters, and eggs. These animals used to be alive but now not a single one exists. We also have many trilobites on display, that are similar to today's insects, but are extinct.

**Strand II: Content of Science**

**Standard III (Earth and Space Science):** Understand the structure of Earth, the solar system, and the universe, the interconnections among them, and the processes and interactions of Earth's systems.

**K-4 Benchmark II:** Know the structure and formation of Earth and its atmosphere and the processes that shape them.

**Museum:**

2-4: Observe that rocks and minerals have different shapes and sizes.

3-4: Fossils are evidence of past life. Observe the fossils and try to find animals that you recognize (recent) and that are extinct.

4: Discuss the 3 rock types and look at examples of each rock type (*ask for this when you request the tour*).

**Strand III: Science and Society**

**Standard I:** Understand how scientific discoveries, inventions, practices, and knowledge influence, and are influenced by, individuals and societies.

**K-4 Benchmark I:** Describe how science influences decisions made by individuals and societies.

**Museum:**

K-4: Products are made from minerals and used in everyday life. Samples we often discuss are halite (= salt), fluorite (= fluoride for toothpaste), bismuthinite (= *pepto-bismol*), aragonite (= Tums, Roloids), gypsum (= wallboard), orthoclase (= in coffee creamer and milkshakes).

**Classroom:**

3-4: Materials change: salt and gasoline are consumed while aluminum can be made from the rock bauxite, but can also be recycled.