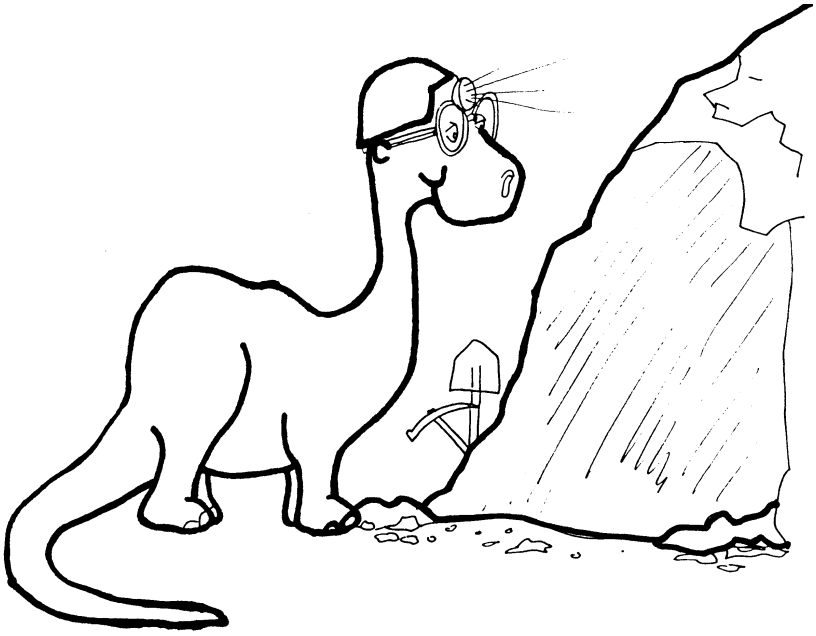
Rock Cycle

Understanding the Earth's Crust

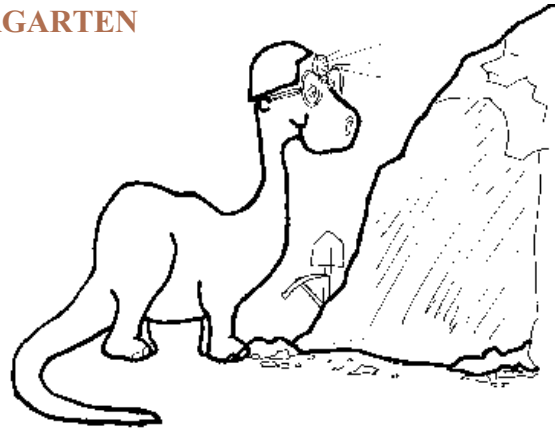
KINDERGARTEN

MINERALS



1 WEEK
LESSON PLANS AND
ACTIVITIES

ROCK CYCLE
OVERVIEW OF KINDERGARTEN



CHEMISTRY

WEEK 1.
PRE: *Distinguishing the four types of matter.*
LAB: *Classifying heavy and light rocks.*
POST: *Exploring elements.*

MINERALS

WEEK 2.
PRE: *Discovering how minerals grow.*
LAB: *Distinguishing different colors of minerals.*
POST: *Exploring the various colors of quartz.*

ROCKS

WEEK 3.
PRE: *Exploring rocks derived from volcanoes.*
LAB: *Discovering two different types of igneous rocks.*
POST: *Exploring myths about rocks.*

WEEK 4.
PRE: *Exploring rocks created in or near water.*
LAB: *Discovering that sand can form different types of rocks.*
POST: *Observing and describing sand.*

PAST LIFE

WEEK 5.
PRE: *Defining "dinosaur."*
LAB: *Classifying extinct and living animals.*
POST: *Contrasting dinosaurs, prehistoric and living animals.*

WEEK 6.
PRE: *Comparing extinct and living animals.*
LAB: *Distinguishing dinosaurs that eat meat.*
POST: *Dramatizing life during the age of dinosaurs.*

ROCK CYCLE - MINERALS (K)

PRE LAB:

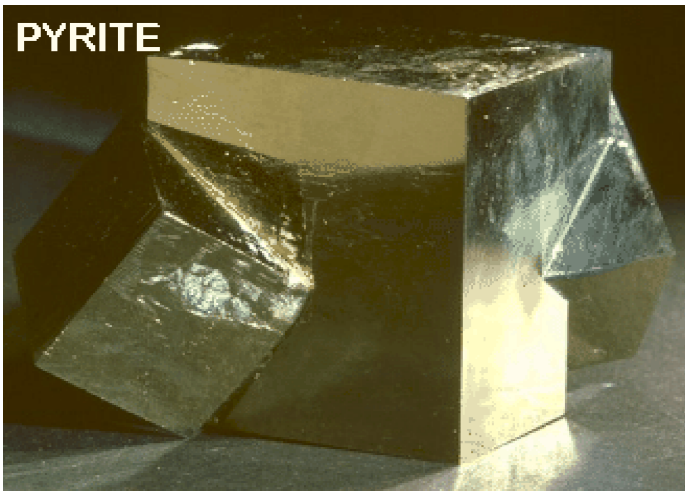
Students learn about “fool’s gold.”

OBJECTIVES:

1. Discovering that minerals grow.
2. Exploring different shapes and colors of minerals.

VOCABULARY:

crystal
cube
grow
mineral
pyrite
square



MATERIALS:

worksheet
crayons
pieces of pyrite

BACKGROUND:

A mineral is a substance that is composed of one or more elements made from nonliving (inorganic) materials. Minerals can form a variety of different geometric shapes. If the minerals grow into a particular shape, they are called crystals. Many students associate the word "grow" with living organisms. When minerals grow, they become larger. Some minerals grow into different shapes and have many different colors. Other minerals have no distinct shapes and only one color.


Ice produces crystals when frozen.

Not all crystals are minerals. Minerals must be inorganic (not living at one time). For example, sugar can form crystals, but it is not a mineral. Water can form crystals when in its solid state of matter, but because its natural state on Earth is liquid it is rarely considered a mineral.

In this lab the students will be looking at the mineral pyrite. Pyrite, better known as "fool's gold," makes a perfect cubic crystal and also breaks into cubic shapes. Pyrite is

composed of iron and sulfur. Pyrite has a distinct gold-like color (more brassy than gold, which is yellowish). The color of a particular mineral may not always be the same (due to slight variations in the overall chemistry), but the mineral pyrite is always this golden, brassy color.

Miners would see pyrite in rocks and think it was gold. Gold is denser than pyrite and has a yellow color, compared to the brassy color of fool's gold. Many miners would think they were rich when they found pyrite and when they came into town bragging about their riches, the other miners would just say you are a "fool," hence the name "fool's gold."

PROCEDURE:

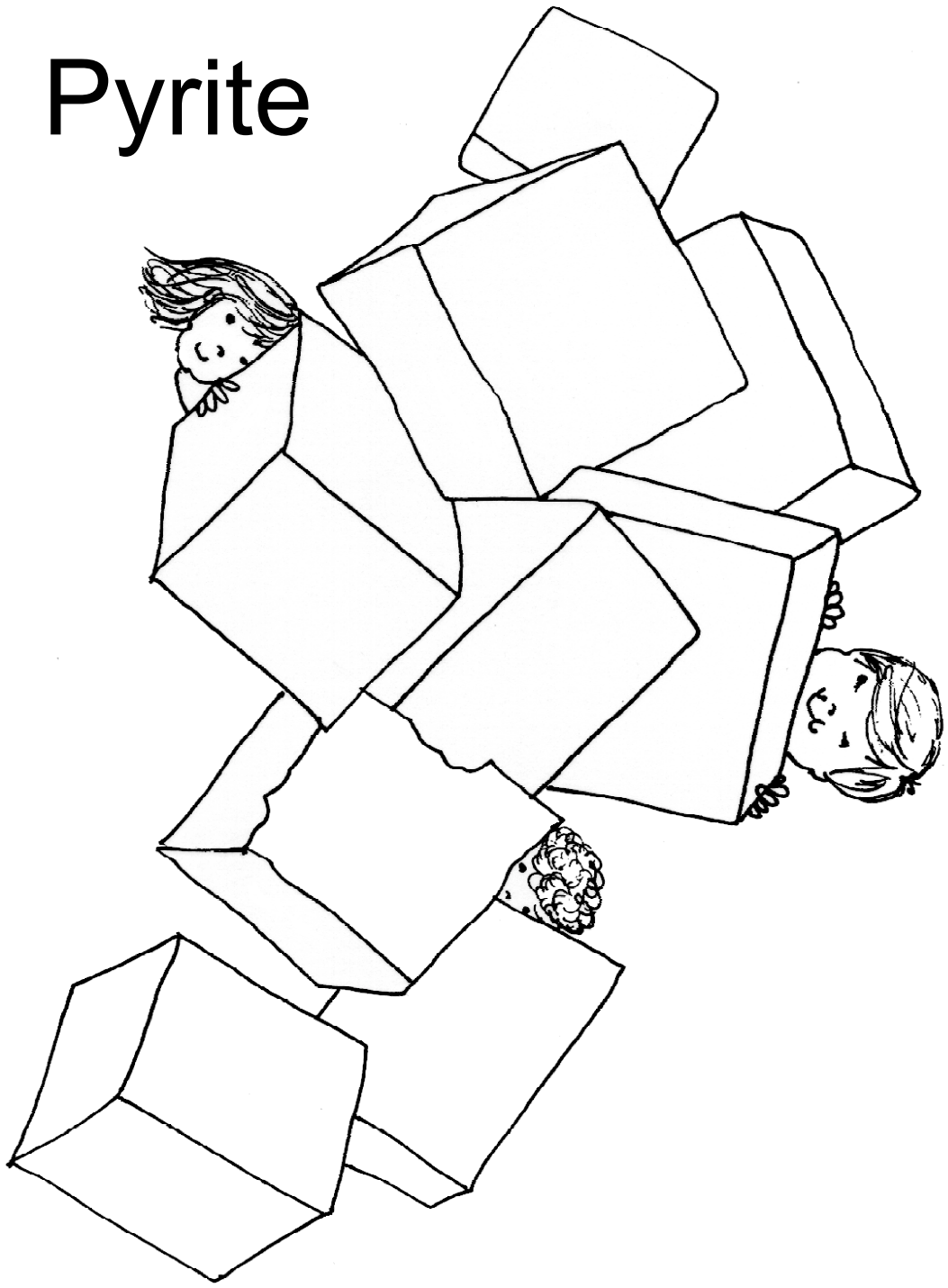
1. Give students some background information on pyrite. Students are interested in pyrite because it looks so much like gold.

2. Show the students a piece of pyrite and ask them to give you some descriptions of this mineral. Students will call pyrite "gold colored." Tell them that gold has a yellow color. You can show them a piece of gold jewelry to illustrate this. Explain that pyrite is a brassy color.

3. Have the students look at the worksheet. Ask students what shape the children in the picture are playing on. They will probably use the term square. Instruct them that the correct shape is cubic because the crystal is not flat, like a square, but is three dimensional. Show them examples of squares and cubes in the classroom.

4. Pass out samples of pyrite and ask the students to look for cubic shapes. The mineral pyrite grows in these cubic shapes. Some pyrite has other crystal forms, but most of the samples you will have are cubic.

5. Ask the students to color in the pyrite crystal on the worksheet. If they don't have a gold crayon, they can use yellow or orange.


Pyrite

ROCK CYCLE - MINERALS (K)

LAB

Students identify the colors of minerals.

OBJECTIVES:

1. Distinguishing different colors of minerals.
2. Determining a color for specific minerals.

VOCABULARY:

black
clear
color
copper
gold
green
mineral
white

Green is malachite and blue is azurite.

MATERIALS:

Rock Cycle - Minerals (K)
crayons

BACKGROUND:

A mineral is defined as an inorganic solid material with specific physical and chemical properties and a stable internal structure. Minerals maybe composed of one or more elements or compounds. Minerals have to be naturally created or else they are classified as man-made substances.

Rocks are combinations of minerals. Minerals are important for several reasons. Some groups of minerals indicate the temperatures and pressures at which they were created, and can be used to interpret the history of the rocks. Minerals are economically important as gems, metals, abrasives, fertilizers, and many other commodities. Historically, minerals have played an important part in the settling of the western United States as well as other nations. Finally, minerals are one of the building blocks of the bones in our bodies.

PROCEDURE:

1. Review minerals with the students. Explain that minerals have different shapes

and colors. Some minerals grow into pretty crystals, while others do not. All mineral crystals have definite shapes.

Give each student or each student group a set of the following minerals:

GRAY - HEMATITE
GREEN - ADVENTURINE (a type of quartz)
WHITE - DOLOMITE
CLEAR - QUARTZ - crystal
COPPER - COPPER
PINK - ROSE QUARTZ
GOLD - PYRITE - crystal

2. Review the colors with the children. Ask them to repeat the words several times and find the crayons that are the appropriate color for each of the words. If the children have many crayons, they will notice that there are many different shades of a particular color. In nature, many of the colors they see are not pure colors.

Copper is copper colored.

3. Allow the students time to trace the word with the correct color (with the word "clear" have children outline the word). The students are then to find the minerals that best fit the indicated colors. Students may have trouble determining the exact colors of the minerals. Usually if a student picks a different color than you did, he or she had a good reason. A child's eye sometimes picks up shades adults don't see! You may want them write the name again in the appropriate color.

4. Ask the students to put the mineral next to the correct color. Monitor their work by moving about the classroom.

5. After the students examine each of the specimens you can discuss with them if any of the minerals were crystals. Hopefully, they can distinguish quartz and pyrite as crystals. Some of the samples are broken pieces and therefore their crystalline structure may be difficult to see.

ROCK CYCLE - MINERALS (K) LAB

GRAY
CLEAR
GREEN
PINK
WHITE
GOLD
COPPER

ROCK CYCLE - MINERALS (K)

POST LAB

Students color a drawing of a quartz crystal.

OBJECTIVES:

1. Exploring the various colors of quartz.
2. Learning that the same mineral may have more than one color.

VOCABULARY:

mineral
quartz

MATERIALS:

worksheet
crayons
Gem Display Kit - optional

quartz crystal

BACKGROUND:

Quartz is a very common gemstone. People think it is pretty enough to wear. Quartz is the most abundant mineral found on the Earth's crust. However, most quartz is not found in its six-sided crystal form shown in the picture above.

Some areas are known for their beautiful quartz crystals. The state of Arkansas produces some of the most beautiful clear crystals in the world. Brazil and India are also known for their quartz crystals.

Quartz is very hard, which makes it ideal for gems. Pure quartz is white or colorless, but is commonly found in almost any color imaginable. Since quartz is naturally clear, any chemical impurities will allow the color to “shine” through. Amethyst, tiger eye, adventurine, and agates are all varieties of quartz with impurities in them to cause their distinctive color.

PROCEDURE:

1. Discuss that quartz is a mineral. Explain that many minerals have pretty crystal shapes. Quartz forms hexagonal (six sided) prisms.

2. Inform the students that quartz can be found in many different colors. If you have any jewelry like amethyst (purple), citrine (yellow-brown), agate (multicolored), adventurine (green), tiger's eye, or other stones of quartz, wear them to school and show the jewelry to the students. All these different types of jewelry are different forms of quartz.

Amethyst is the purple variety of quartz and is a popular gemstone. If it were not for its widespread availability, amethyst would be very expensive. The name "amethyst" comes from the Greek and means "not drunken." This was maybe due to a belief that amethyst would ward off the effects of alcohol, but most likely the Greeks were referring to the almost wine-like color of amethyst.

Citrine is any quartz crystal or cluster that is yellow or orange in color. Although, often cut as a gemstone, citrine is actually somewhat rare in nature. Most citrine on the market have been heat treated. Unfortunately citrine it is often confused with the more expensive orange-yellow topaz and is at times sold as topaz by unscrupulous dealers.

Other forms of quartz include:

Milky Quartz is the cloudy white variety.
Rock crystal is the clear variety that is also used as a gemstone.
Rose quartz is a pink to reddish pink variety.
Smoky quartz is the brown to gray variety.

3. Have the students color the worksheet. They can use just about any color!

Quartz