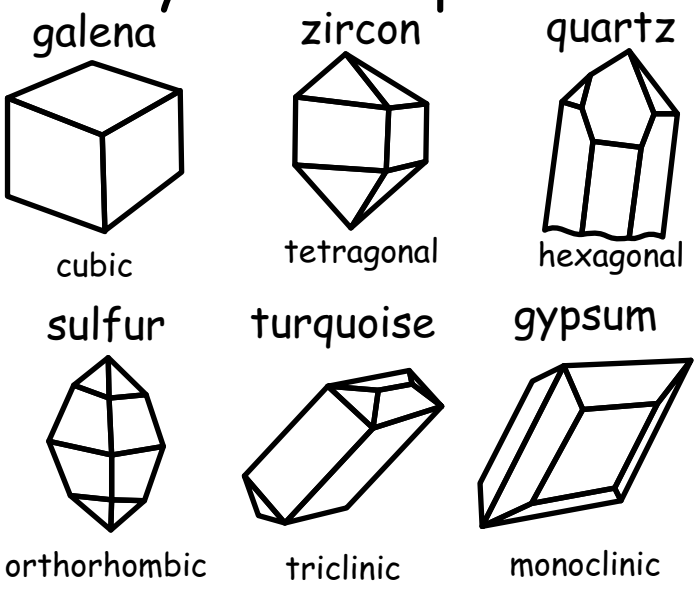
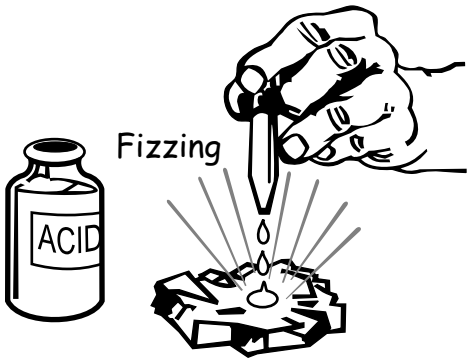
MINERALS AND THEIR IDENTIFICATION

Minerals are natural substances that have definite crystal structure and chemical composition.

Crystal Shape

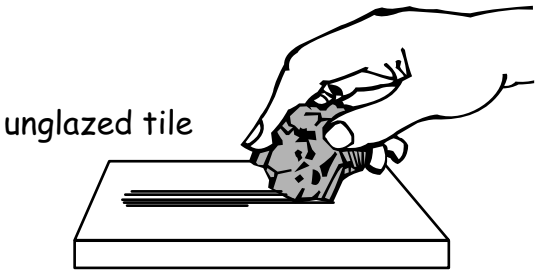


Acid Test



carbonate minerals
calcite
dolomite

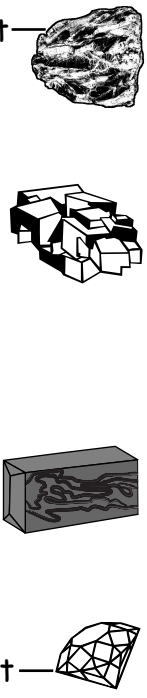
Streak Test



Streak Color	Mineral
lead gray	galena
green	olivine
yellow-brown	limonite
red-brown	hematite
black-green	pyrite
scarlet	cinnabar
light blue	azurite

Hardness Test

1. talc & pencil lead — softest
   2.2 fingernail
2. gypsum
3. calcite
   3.5 copper penny
4. fluorite
   4.5 wire nail
5. apatite
   5.1 steel knife blade
   5.5 window glass
6. feldspar
   6.5 steel file
7. quartz
   7.5 ceramic streak plate
8. topaz
9. corundum
10. diamond — hardest



Albuquerque Gem & Mineral Club
www.agmc.info

03/24/14

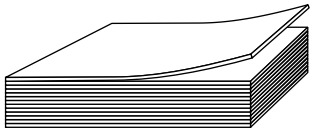
1 What two means could be used to identify the mineral quartz?

2. Iron pyrite is known as "fool's gold". What test can be used to identify it?

STUDY QUESTION: What other tests are used to identify minerals?

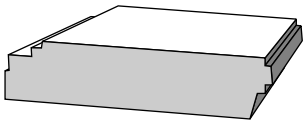
Cleavage

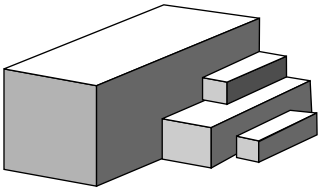
Cleavage planes are the surfaces along which a mineral breaks. The number of cleavage planes a mineral has, and the angles between them, provide useful clues to identification.



Mica has perfect cleavage in one direction only.

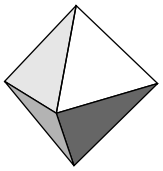
Feldspar has two cleavage directions. This gives four smooth surfaces and two rough ones.





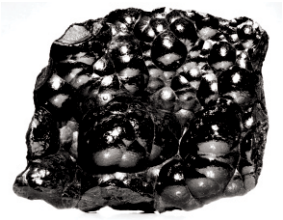
Galena has three cleavages so it breaks into cubes. Calcite also has three but they are at an angle so it breaks into 'rhombs'.

Fluorite and diamond are examples of minerals with four cleavages. They form double-pyramid crystals.

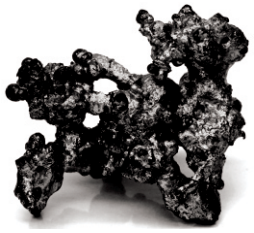


Shape

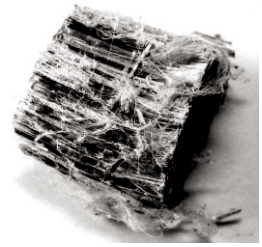
Shape, also called 'habit', can be a useful clue to minerals that do not form large flat-sided crystals. These examples are shapes made up of thousands of tiny crystals. Each habit has a special name.



"Mamillated'
Hematite often forms rounded masses of radiating crystals.



'Dendritic'
Copper is an example of a mineral that forms branching growths.



'Fibrous'
Asbestos forms masses of long parallel crystals that 'fray' into mineral 'wool'.

Density

Density is another very important property. You can measure it with this simple home-made apparatus.

Hang your specimen from the long arm of the balance and add weights (bulldog clips are ideal) to the other end of the arm. Adjust the position of the specimen backward or forward on the arm until it is balanced and the pointer is exactly opposite the reference mark. Note the number of the scale units at the point where the sample is hanging. Call this reading A. Now place a container of water under the sample so that it is submerged. Don't move the bulldog counterweights at all. Instead, slide your sample along the arm to its new balance point. Take a new reading B. The density of your sample is given by this simple formula:

$$\text{Density} = B \div (B-A)$$

So, if your first reading had been 8 units and the second 12 units, the density would have been:

$$12 \div (12-8)=3.$$