"Make Five"

A game about the chemical formulas of some common minerals

By definition, a mineral has a definite chemical composition. It's sort of like a recipe. This game is for students who want to (or need to!) learn the recipes for some common minerals.

You will need:

- copies of the pattern pages copied onto card stock
- scissors
- white glue (if you are assembling the paper dice)

Preparation:

1) Cut out the dice patterns and make into cubes. (Or, you could use three blank wooden cubes and write the letters on each side. Places like Wal-Mart sell wooden cubes in their craft sections. If you want to be able to store the game away in a cupboard without the dice being squashed, this would be the best option.)

2) Cut apart the 16 mineral cards.

How to play:

Place the mineral cards on the table, face up, so they form a 4 x 4 square. Each player will have a turn rolling all three dice at once. The goal is to roll the ingredients to form a mineral. (One roll of the three dice per player per turn.) For example, if the first player rolls: Cu, Fe, and S, he should notice that those are the ingredients of chalcopyrite. Therefore, that player picks up the chalcopyrite card. If the next player rolls Ca, C, and WILD, he could make the wild card into O, and be eligible to pick up calcite.

The first player to collect five cards wins the game.

IT'S ELL-EN-vention! AN

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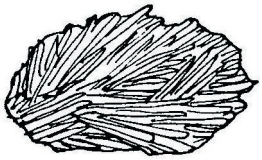
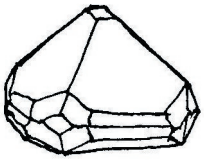
barite



$BaSO_4$

Often found in limestone or hot spring areas. Usually white or light brown. Sometimes crystalizes into rose shapes, which are popular with collectors.

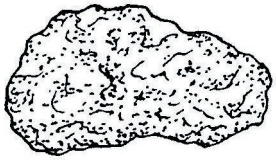
zircon



$ZrSiO_4$

Found in nearly all igneous rocks, although in very small amounts. Because it is so hard, it is often used as a gemstone in jewelry.

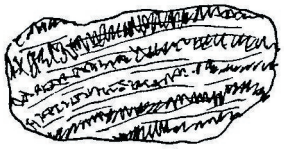
hematite



Fe_2O_3

Hematite is a major ore (source) of iron. The name "hematite" comes from its blood-red color ("hema" means blood).

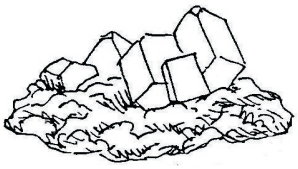
cinnabar



HgS

Cinnabar has a reddish color and is very dense (heavy) because of the mercury (Hg). Pure mercury is a liquid at room temperature, but it is a solid when bound to sulfur.

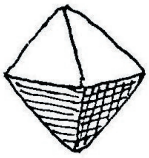
cuprite



Cu_2O

Cuprite forms cubic crystals. It is sometimes called "ruby copper" because of its color. When exposed to air it changes to CuO.

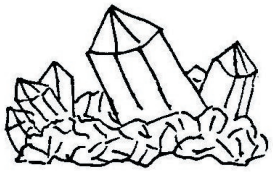
fluorite



CaF_2

Fluorite is used in the production of steel. It has a glassy luster and can look similar to a quartz crystal, except for its tetragonal (4-sided) shape.

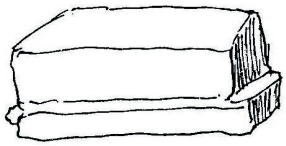
quartz



SiO_2

Quartz is used in electronics, as a gemstone, and in the manufacturing of glass (where it is the main component). Sand is made of very tiny pieces of quartz.

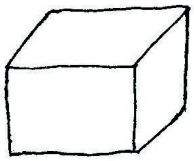
galena



PbS

Galena is very dense (heavy) because of the lead in it. During the era of musket rifles, galena was used as the source of lead to make musket balls.

pyrite

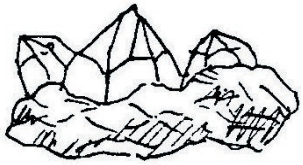


FeS_2

This mineral is often called "fool's gold" because of its golden color and shiny luster. It has no actual gold in it. It leaves a black streak, not gold.

COPY ONTO WHITE CARD STOCK, CUT CARDS APART

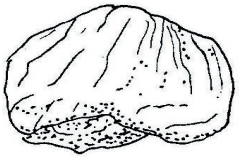
corundum



Al_2O_3

Corundum is very hard. It is so hard that it is used in industry as an abrasive (like sand paper). Blue corundum is called a sapphire and red is a ruby.

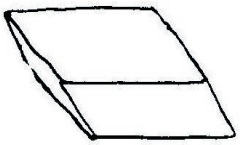
talc



$Mg_3Si_4O_{10}$

Talc is extremely soft. In fact, you can scratch it with your fingernail! Talc is the main ingredient in talcum powder (used to dry off after a shower).

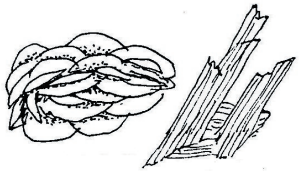
calcite



$CaCO_3$

Calcite is the main ingredient in limestone. It is one of the most common minerals in the world. Caves are made of limestone.

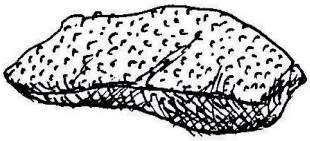
gypsum



$CaSO_4$

Gypsum is a soft mineral. It is one of the main ingredients in plaster and plasterboard. One type of gypsum is called alabaster and was carved by ancient peoples.

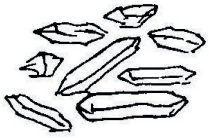
chalcopyrite



$CuFeS_2$

Chalcopyrite is pinkish-purple with flecks of gold. It is found wherever copper is mined. The copper can be taken out of it by using chemical processes.

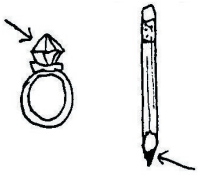
epsom salt



$MgSO_4$

This mineral dissolves into water very easily. It is often used in medical treatment of wounds on hands and feet. It helps in the healing process.

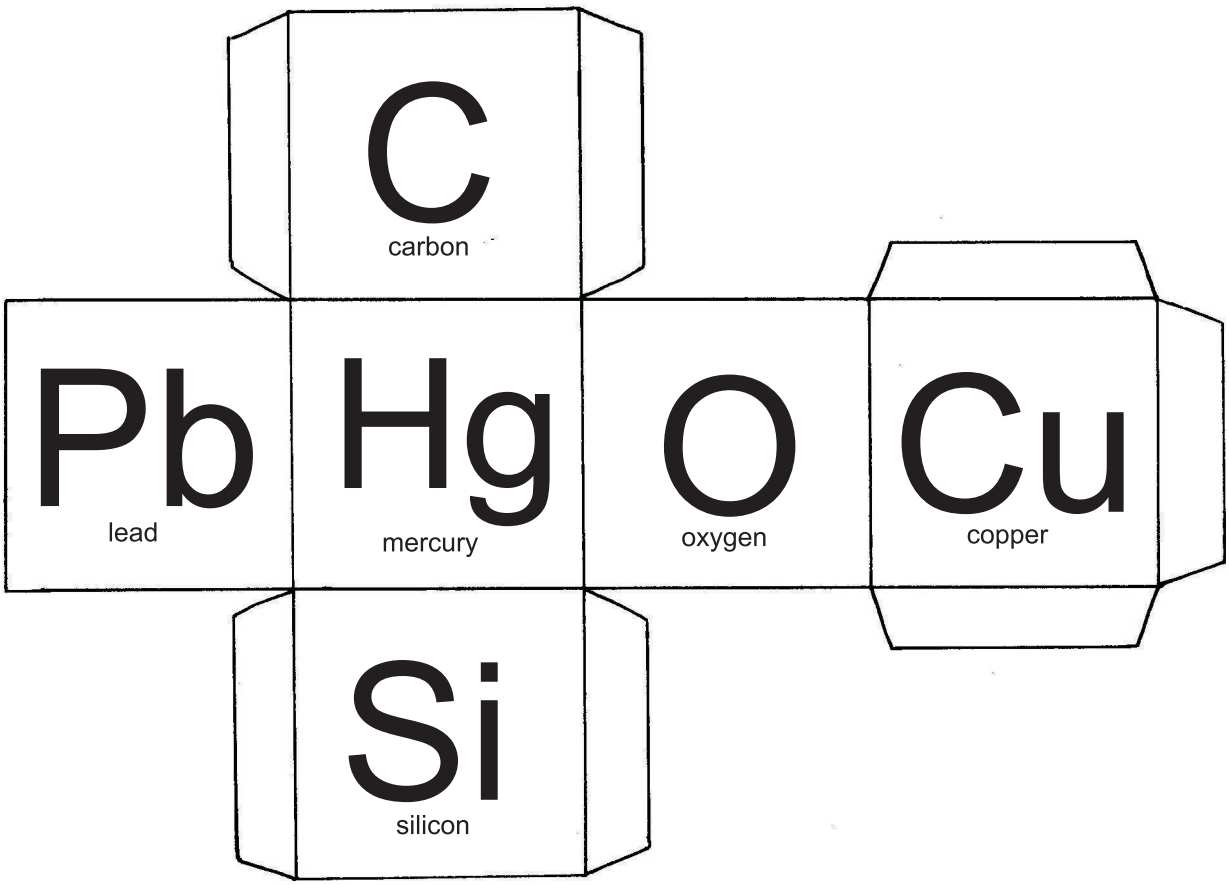
diamond/graphite

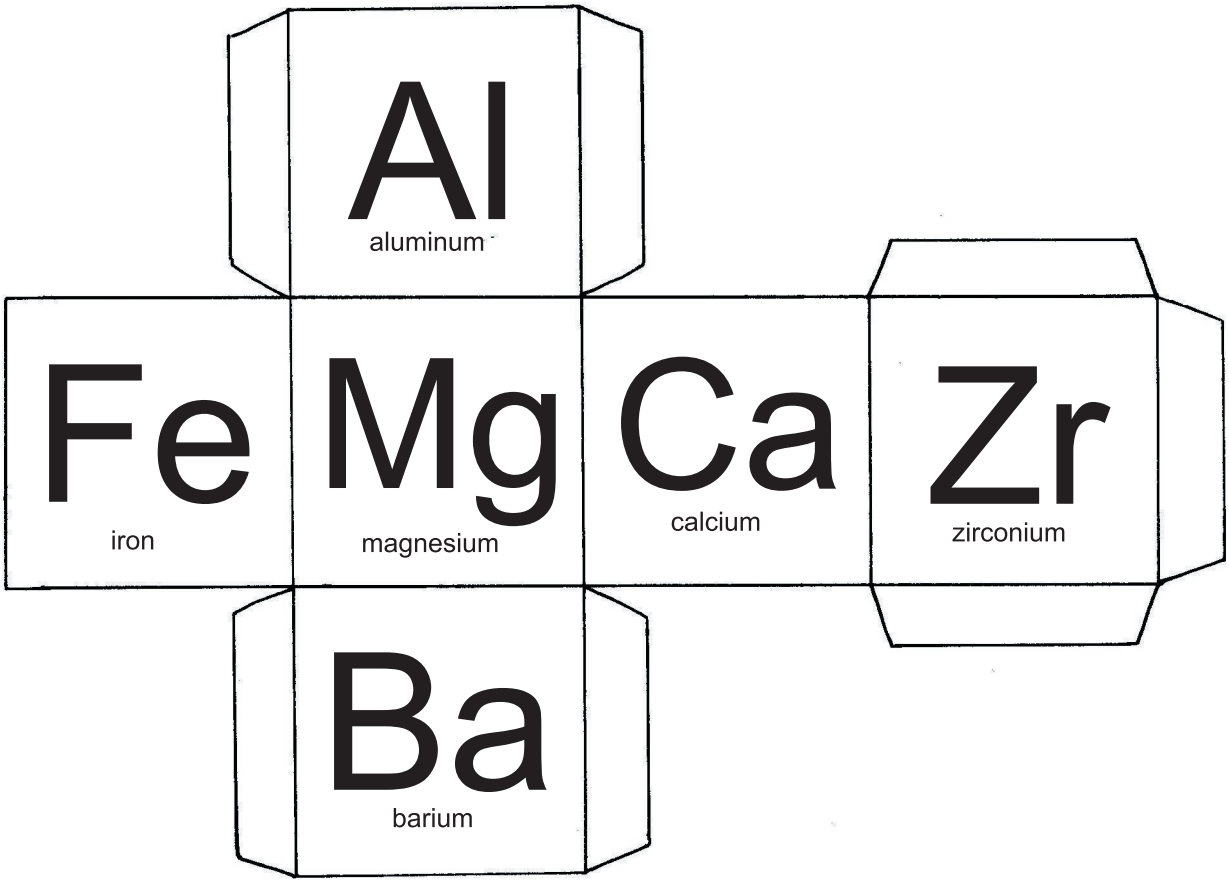


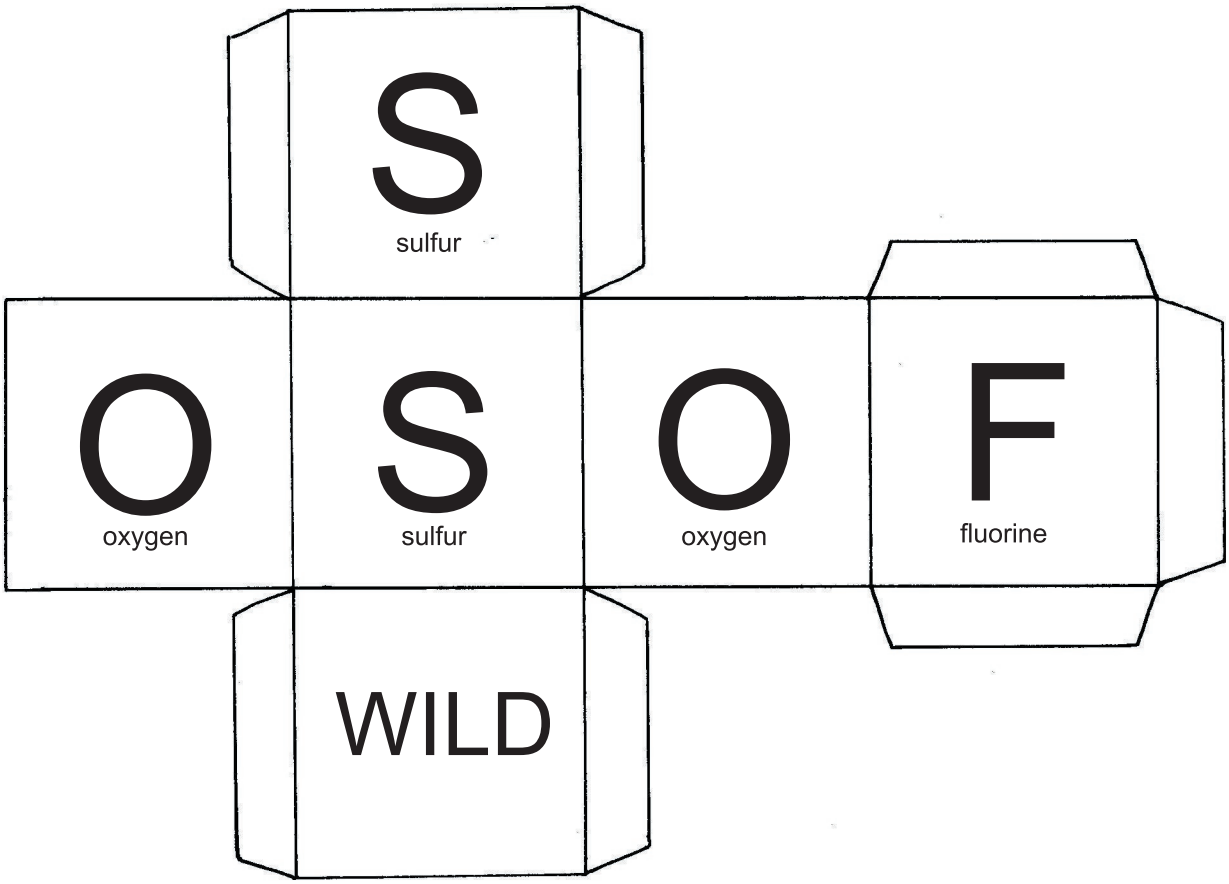
C

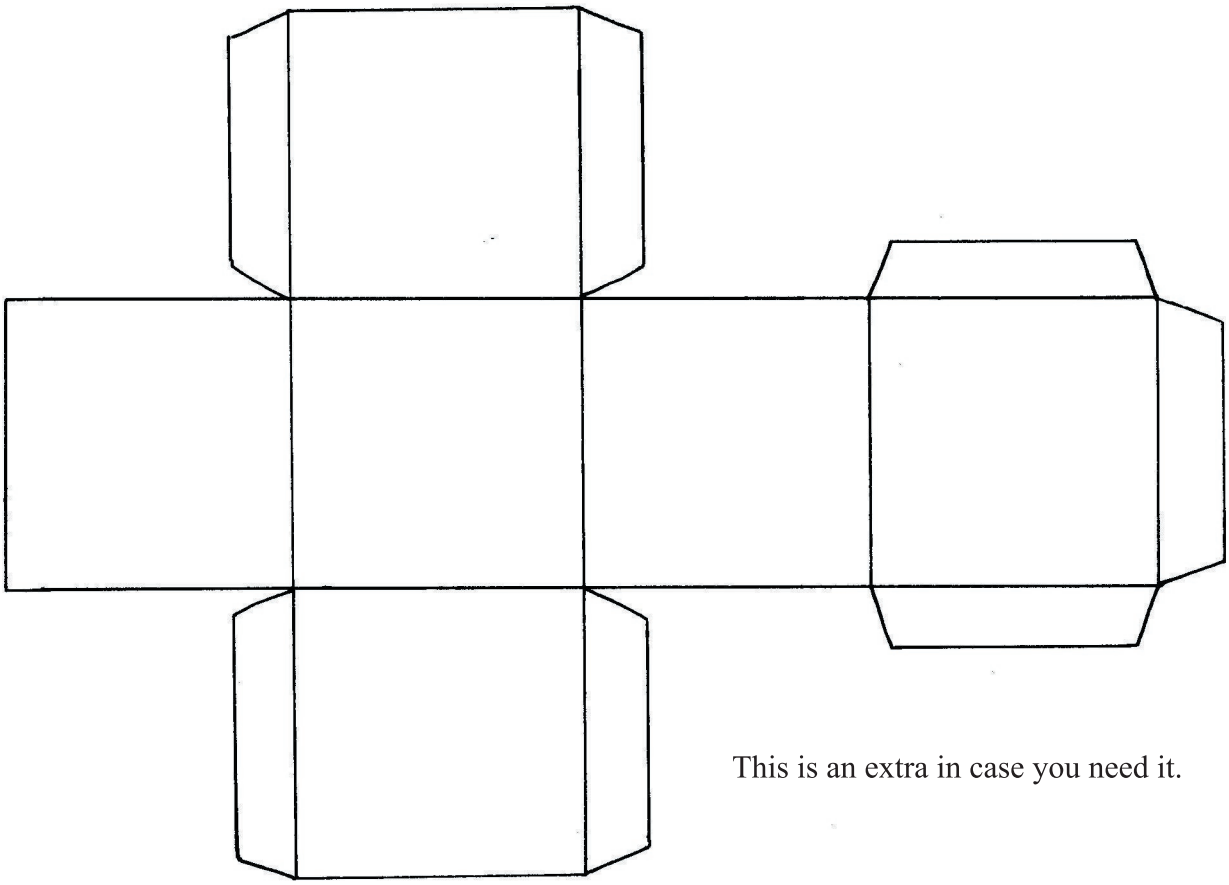
Strangely enough, both priceless diamonds and the stuff in your pencil are made of the same thing: pure carbon. The difference is how the atoms are bonded together.

COPY ONTO WHITE CARD STOCK, CUT CARDS APART


C
carbon
Pb
lead
Hg
mercury
O
oxygen
Cu
copper
Si
silicon


Al
aluminum
Fe
iron
Mg
magnesium
Ca
calcium
Zr
zirconium
Ba
barium





This is an extra in case you need it.

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