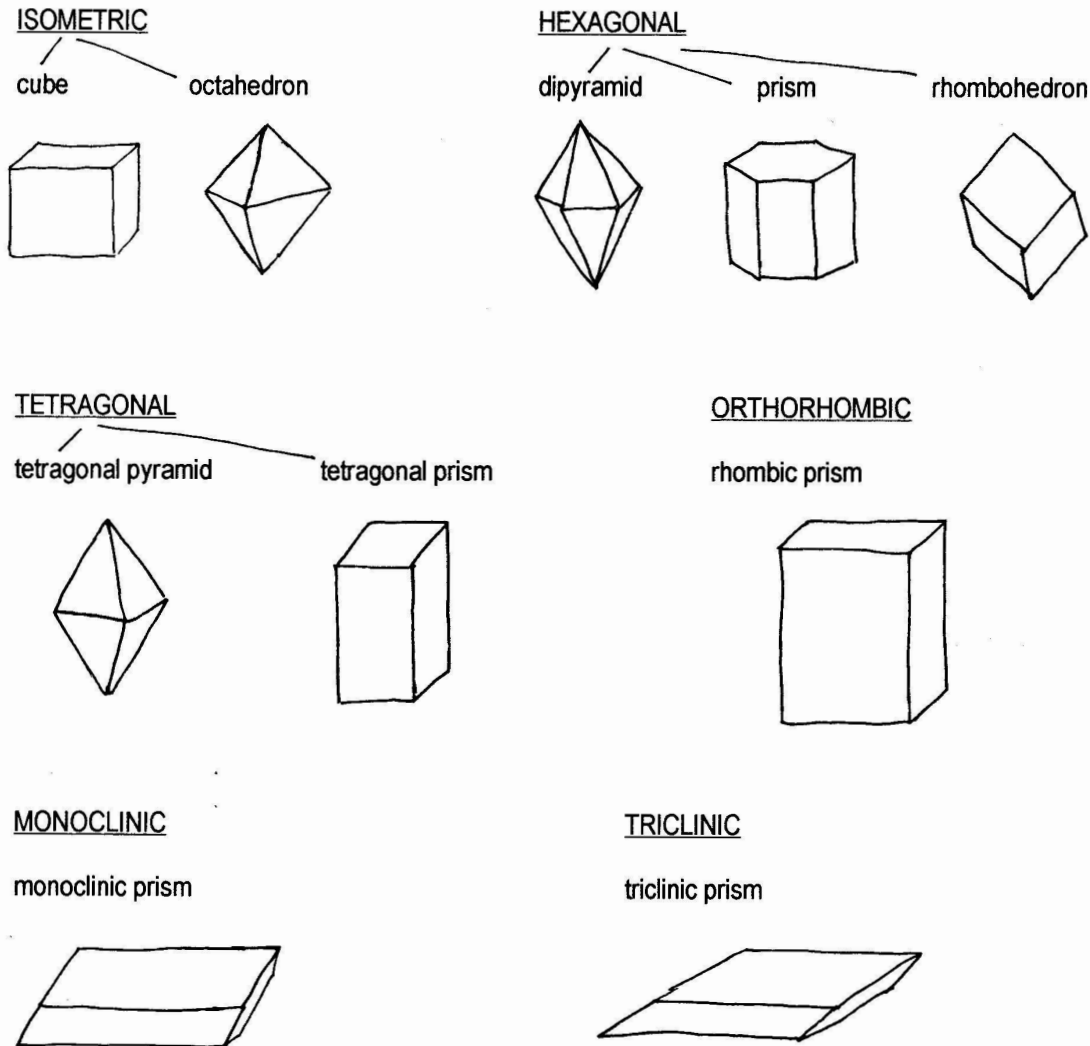


Cut-and-assemble mineral crystal shapes

A mineral, by definition, has a crystal shape. These shapes fall into one of six basic groups, although there are many variations within these groups. (In fact, some of these variations may look to us very unlike anything else in the group.) The defining characteristic that determines which group a crystal belongs in is the geometric angles between the atoms in the crystal.

The shapes shown below are the simplest shapes in each category. If you want to see other variations, a good rock and mineral book (such as Simon & Schuster's Guide) will have drawings of much more complex shapes. (The Internet probably has this same information, too.)



Examples of minerals in each category:

ISOMETRIC: salt, pyrite, garnet, galena, fluorite, copper, silver, gold

HEXAGONAL: quartz, calcite, tourmaline, graphite, beryl, apatite, corundum, hematite, cinnabar

TETRAGONAL: zircon, rutile, wulfenite, chalcocopyrite

ORTHORHOMBIC: sulfur, topaz, olivine, barite, stibnite, epsomite, aragonite

MONOCLINIC: orthoclase, mica, gypsum, malachite, azurite

TRICLINIC: albite, rhodonite

You will need:

- copies of the pattern pages printed onto card stock (any color)
- scissors
- white glue
- paper clips or clothespins to hold joints while they dry (optional, but recommended)

Directions:

- 1) Copy the pattern pages onto card stock. (Tip: Card stock feeds through most computer printers, so if getting to a copy shop is hard, keep a supply of card stock on hand so you can print onto it using your computer's printer.)
- 2) Cut out the crystal shapes. Cut on all solid lines.
- 3) You may want to "score" the dotted fold lines using a ruler and a very sharp pencil. Run the sharp pencil point along each fold line. Press hard enough that the paper is slightly dented. This will make folding very easy.
- 4) Pre-fold along all the fold lines. Don't be overly concerned about folding the wrong way because any pre-folding is better than none at all.
- 5) Put a SMALL amount of white glue on one or two of the tabs. White glue is very strong and you don't need a lot of it. Press and hold those one or two joints for at least 30 seconds. If you don't have the time or patience to hold the joints, clip them with paper clips or clothespins and let them dry for a few minutes.

The most common mistake students make when assembling paper projects is to use too much glue. If glue oozes out the cracks when you press the joint, you've used too much glue!!

One way to help students avoid using too much glue is to tell them not to squeeze it directly from the bottle onto the tab. Have them put a few drops onto a piece of paper and just dip the tip of their finger into it.

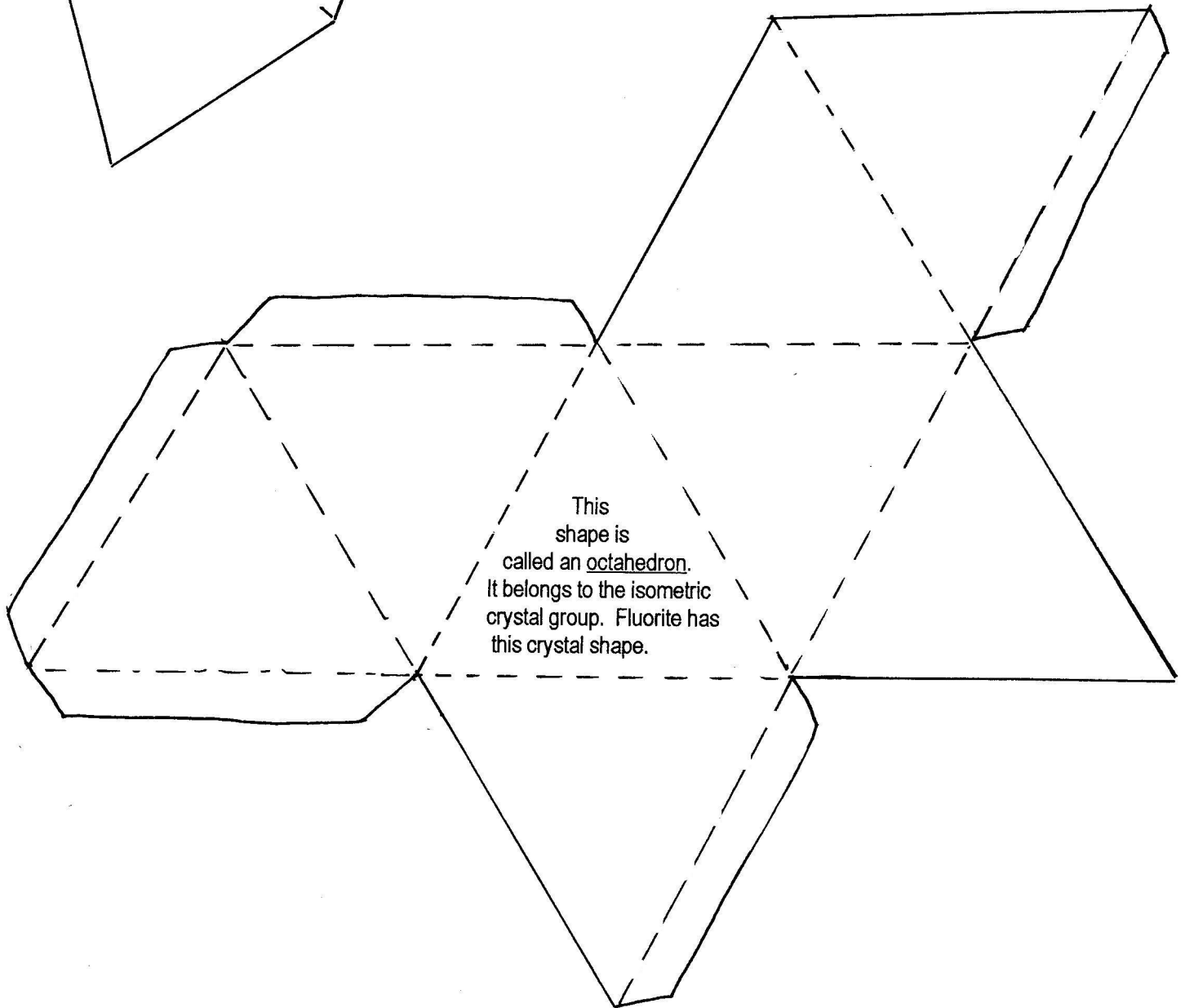
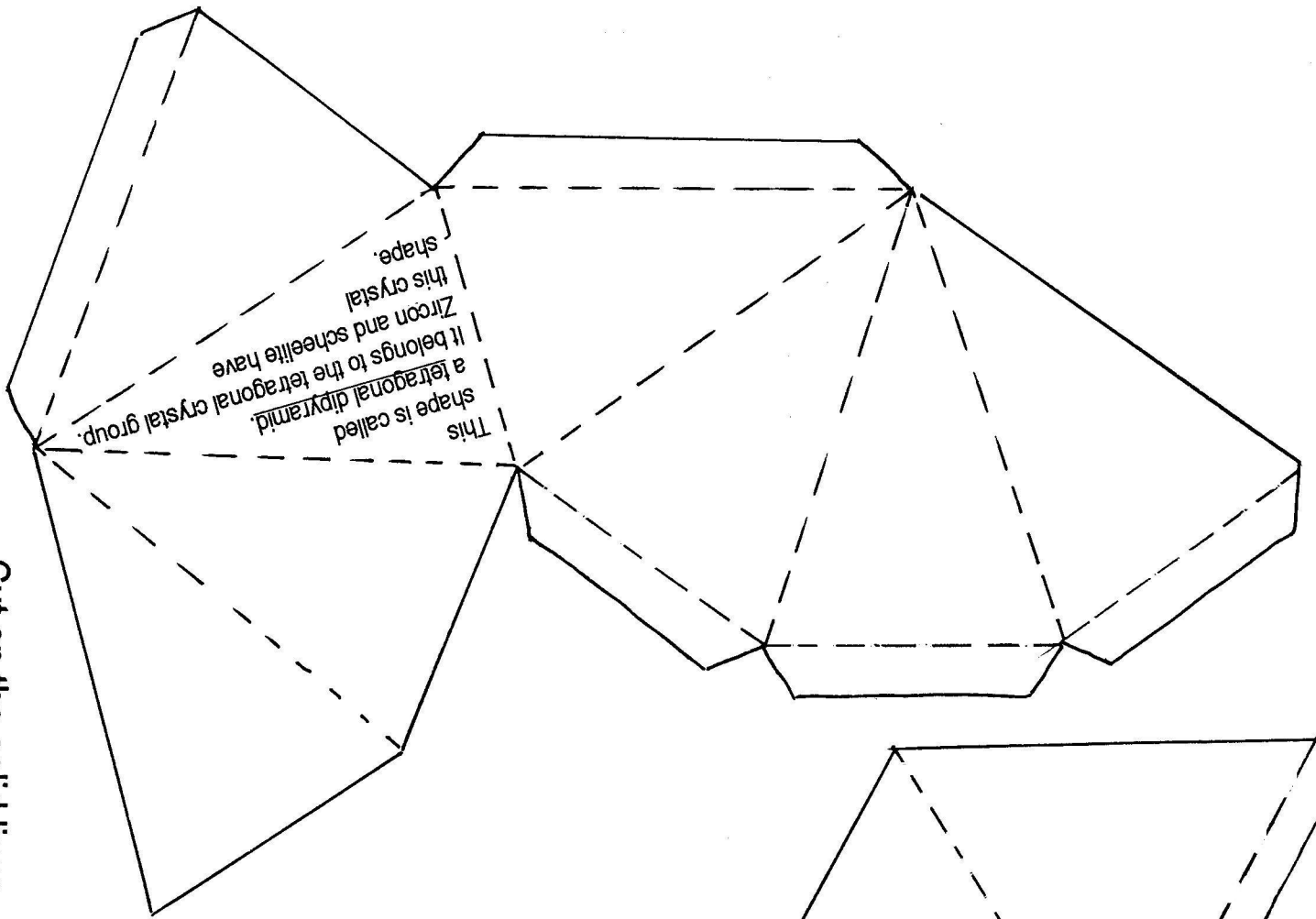
You may want to work on two models at a time. This way, while one set of joints is drying, you can be working on another one.

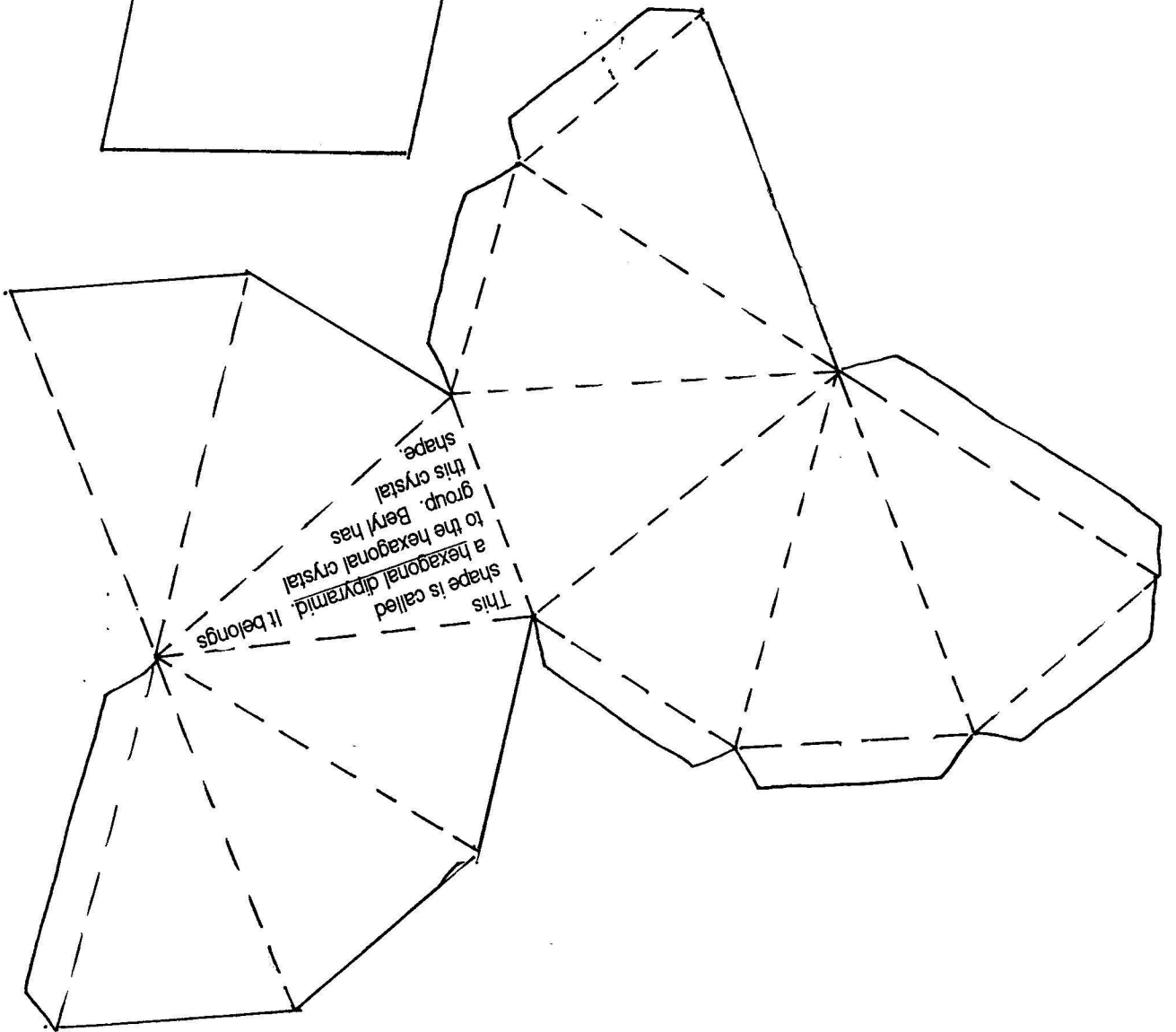
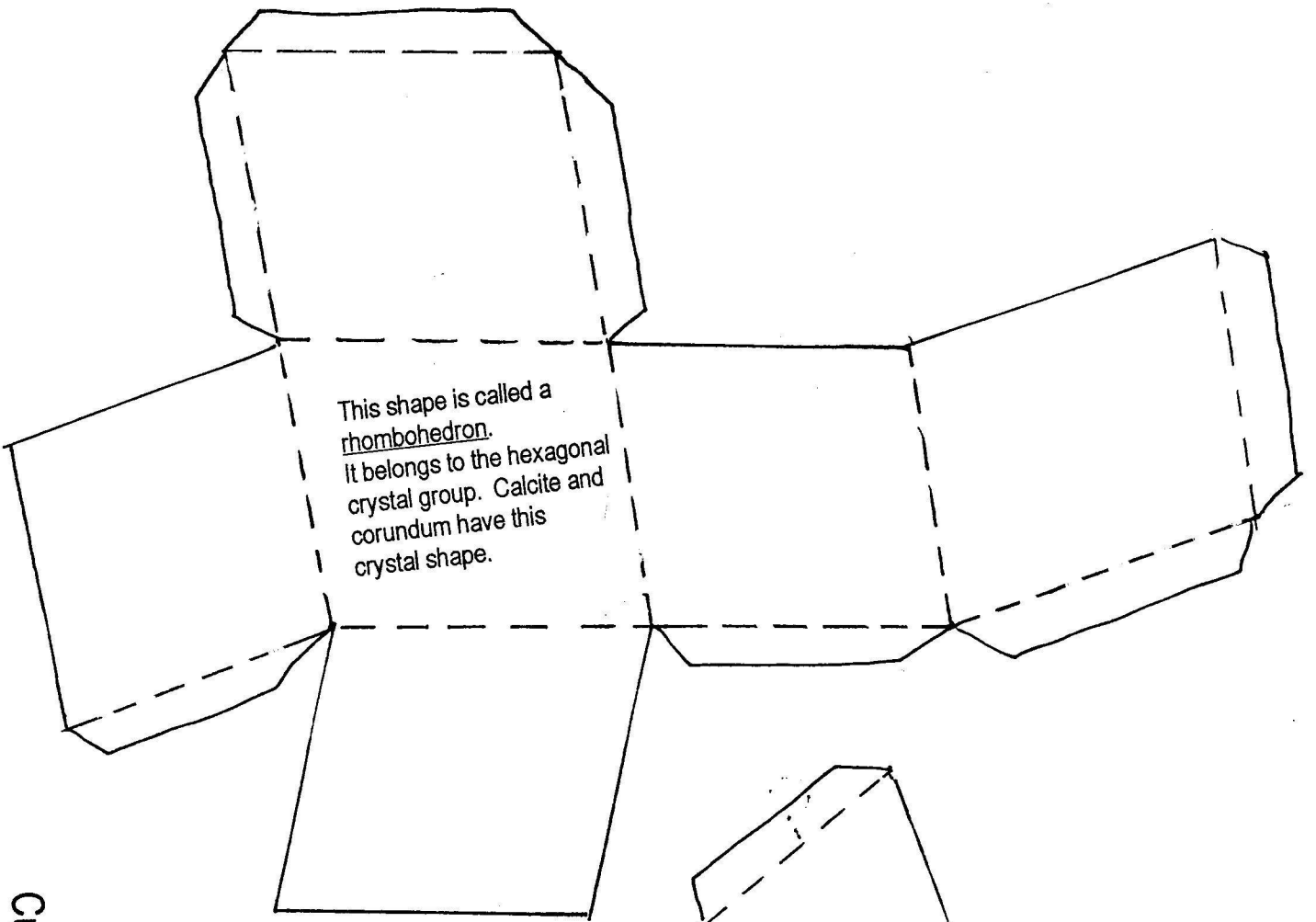
6) When you get to the last joints, you just have to do the best you can to get the joints to stick. You can try folding the tabs just barely enough to get them in, so that after they are in they will apply a little counterpressure and push back up against the surface. Or, you could resort to using a flattened out paperclip that you can poke into the adjacent corner, giving you an extra hand (albeit a skinny one!) inside the figure. You might not have to resort to this though. The best tool you've got when doing a project like this is: PATIENCE!

Display suggestion: The complete figures make a nice mobile. (They are also less likely to be damaged while hanging up.)

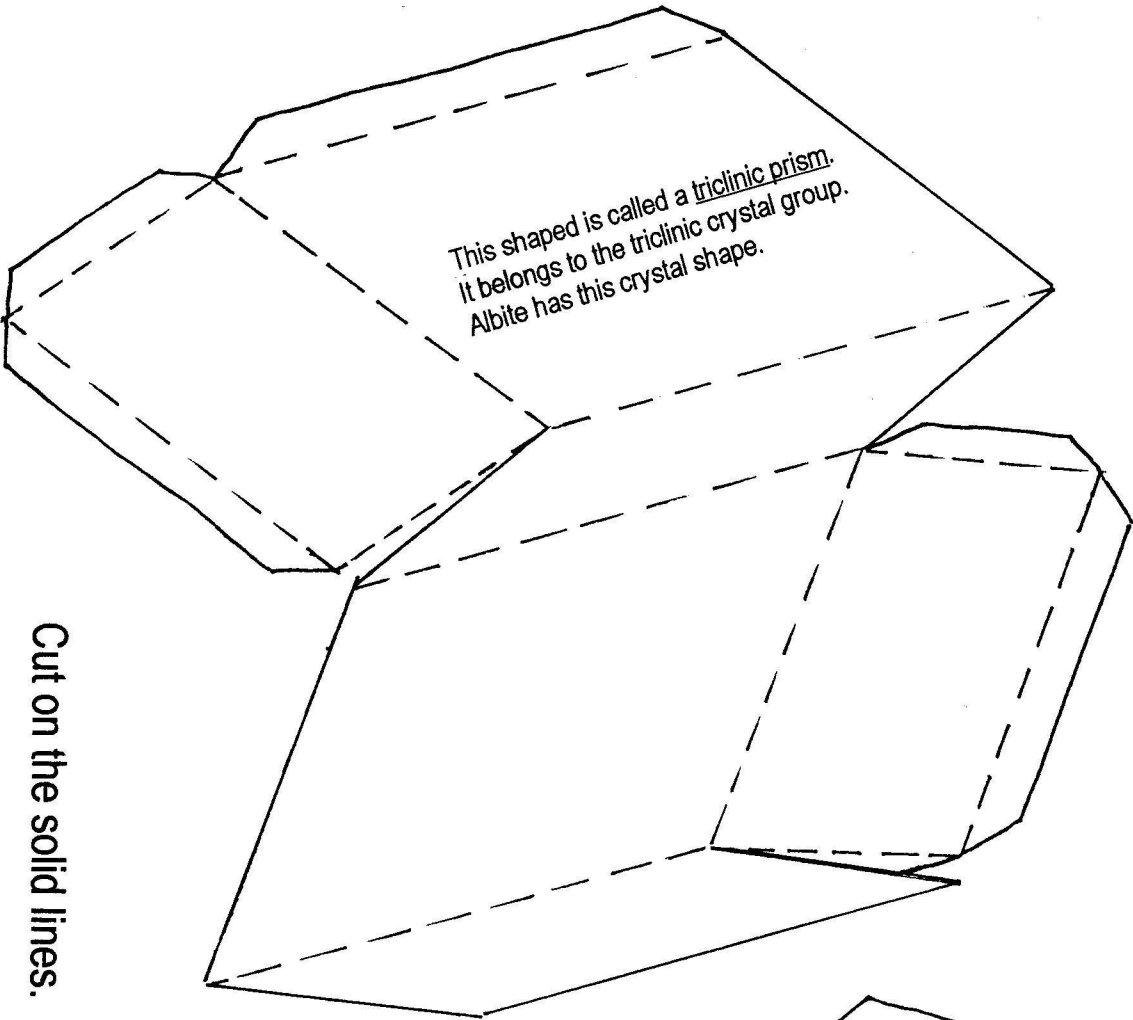


Cut on the solid lines. Fold on the dashed lines.



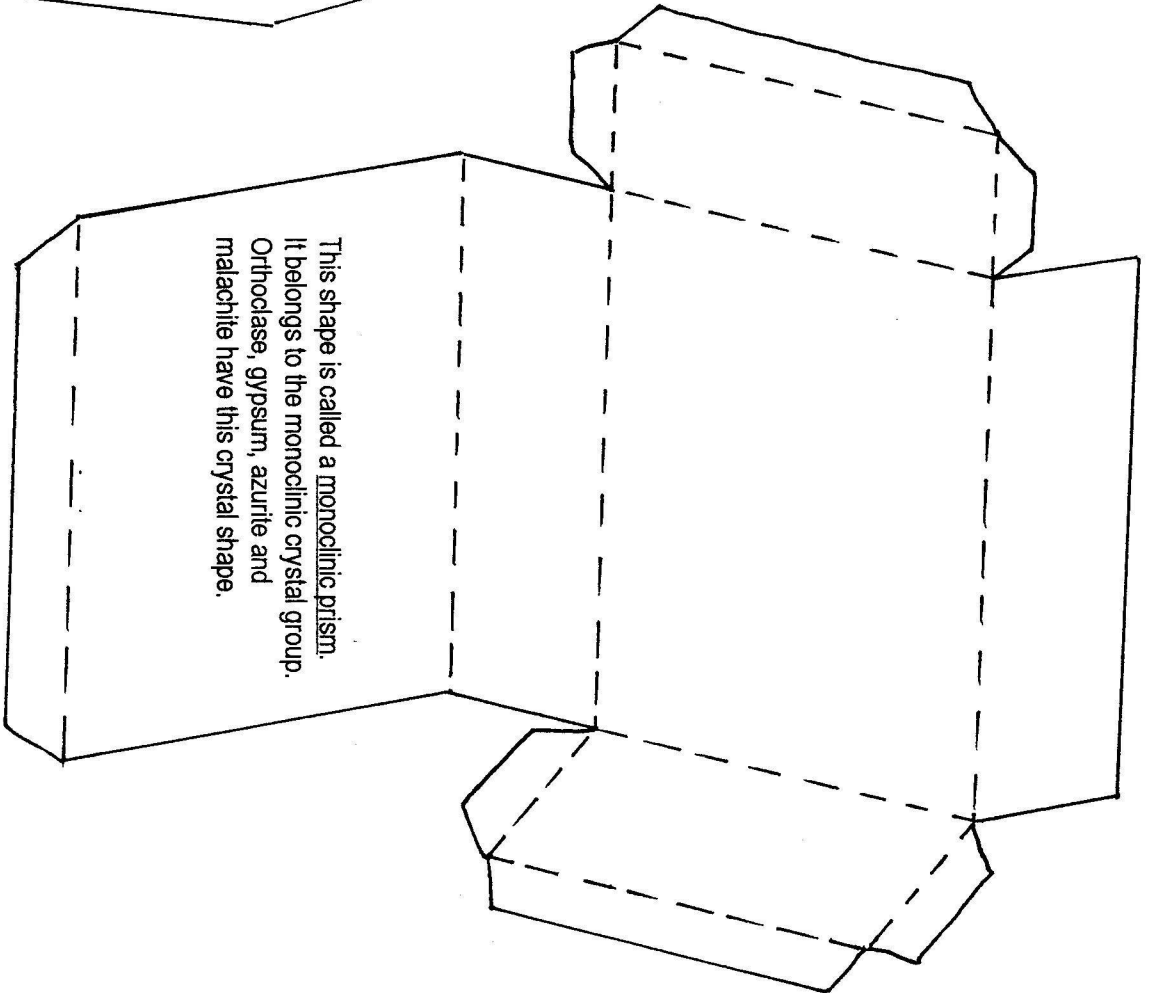


Cut on the solid lines. Fold on the dashed lines.

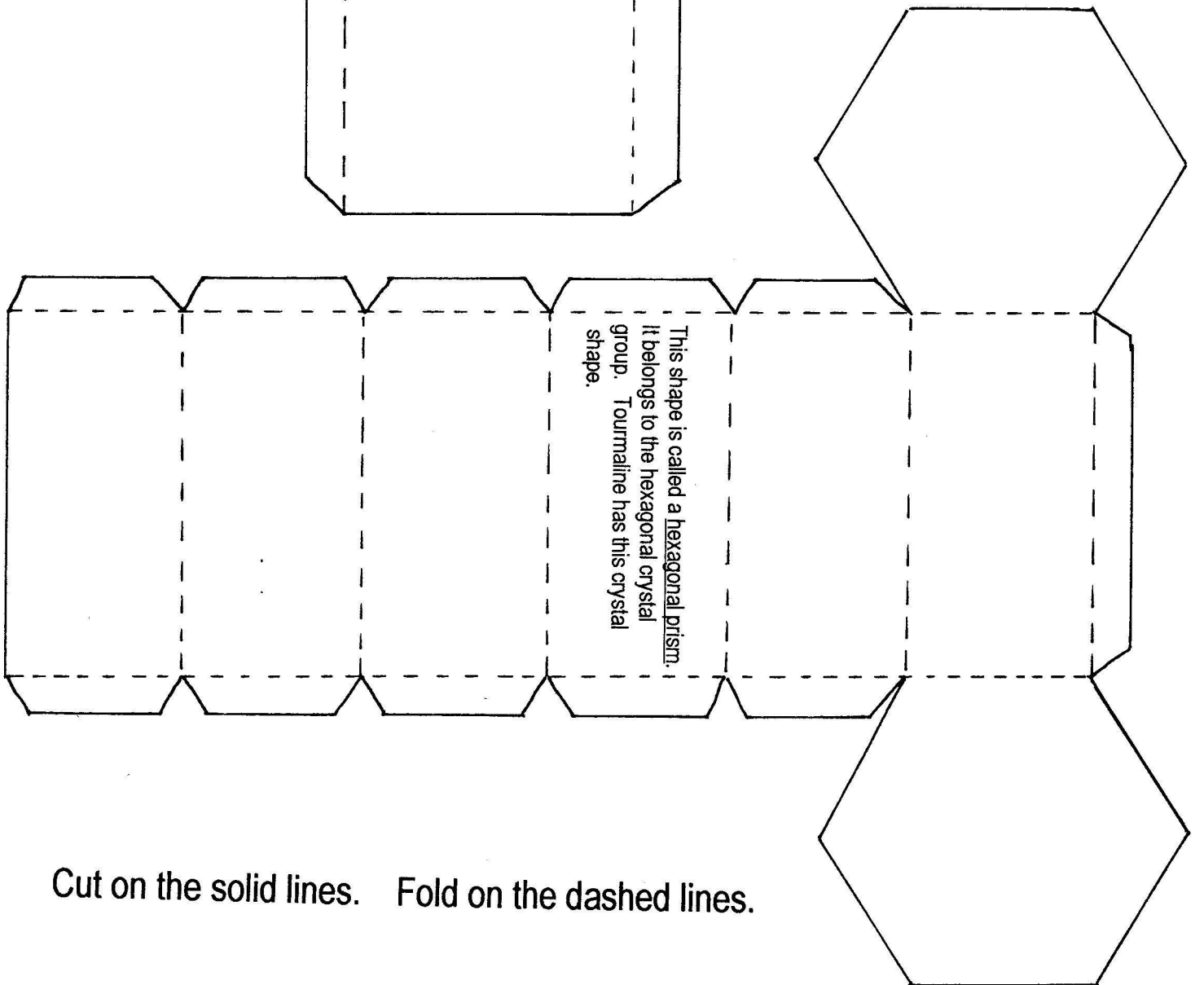
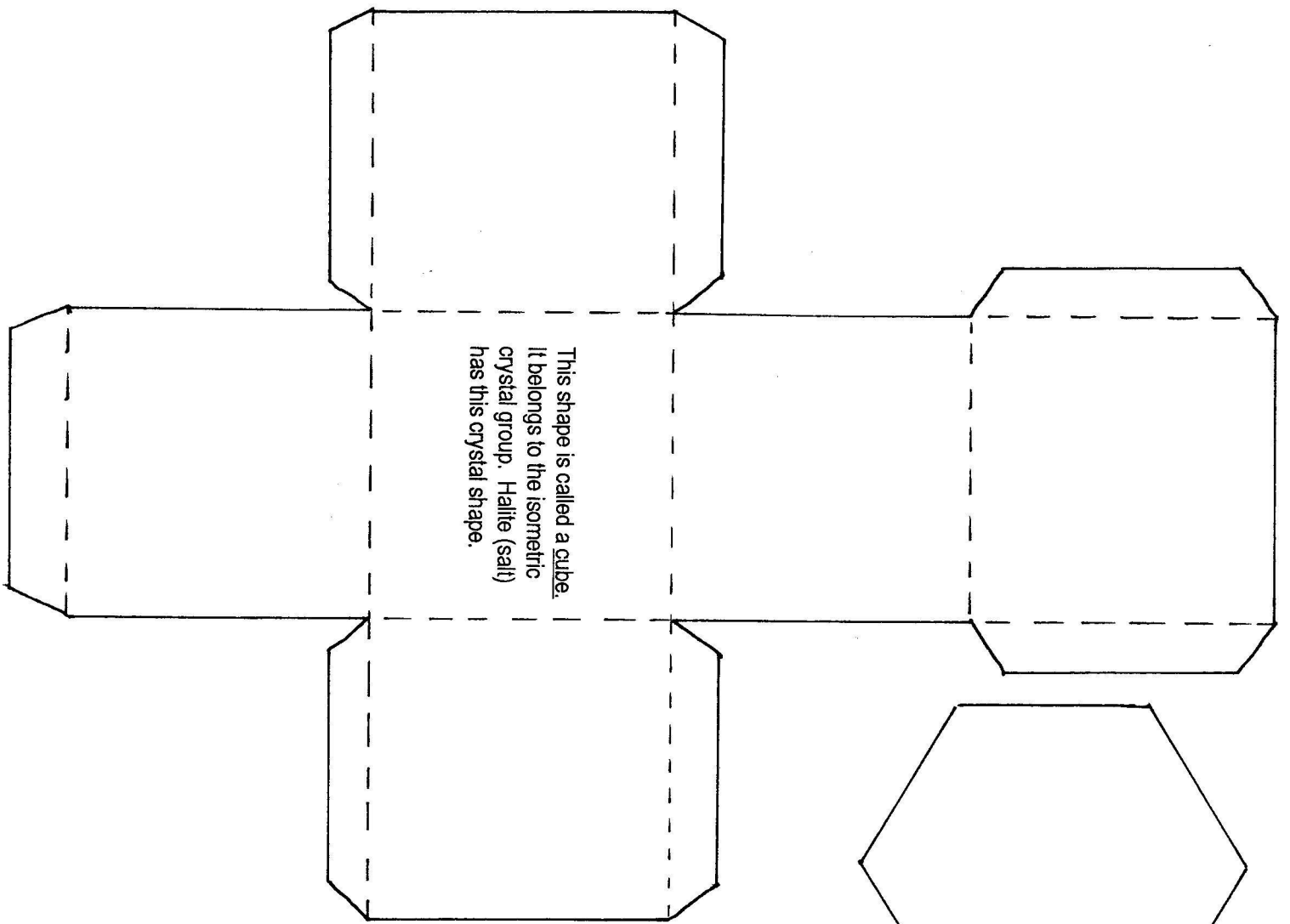


This shaped is called a triclinic prism.
It belongs to the triclinic crystal group.
Albite has this crystal shape.

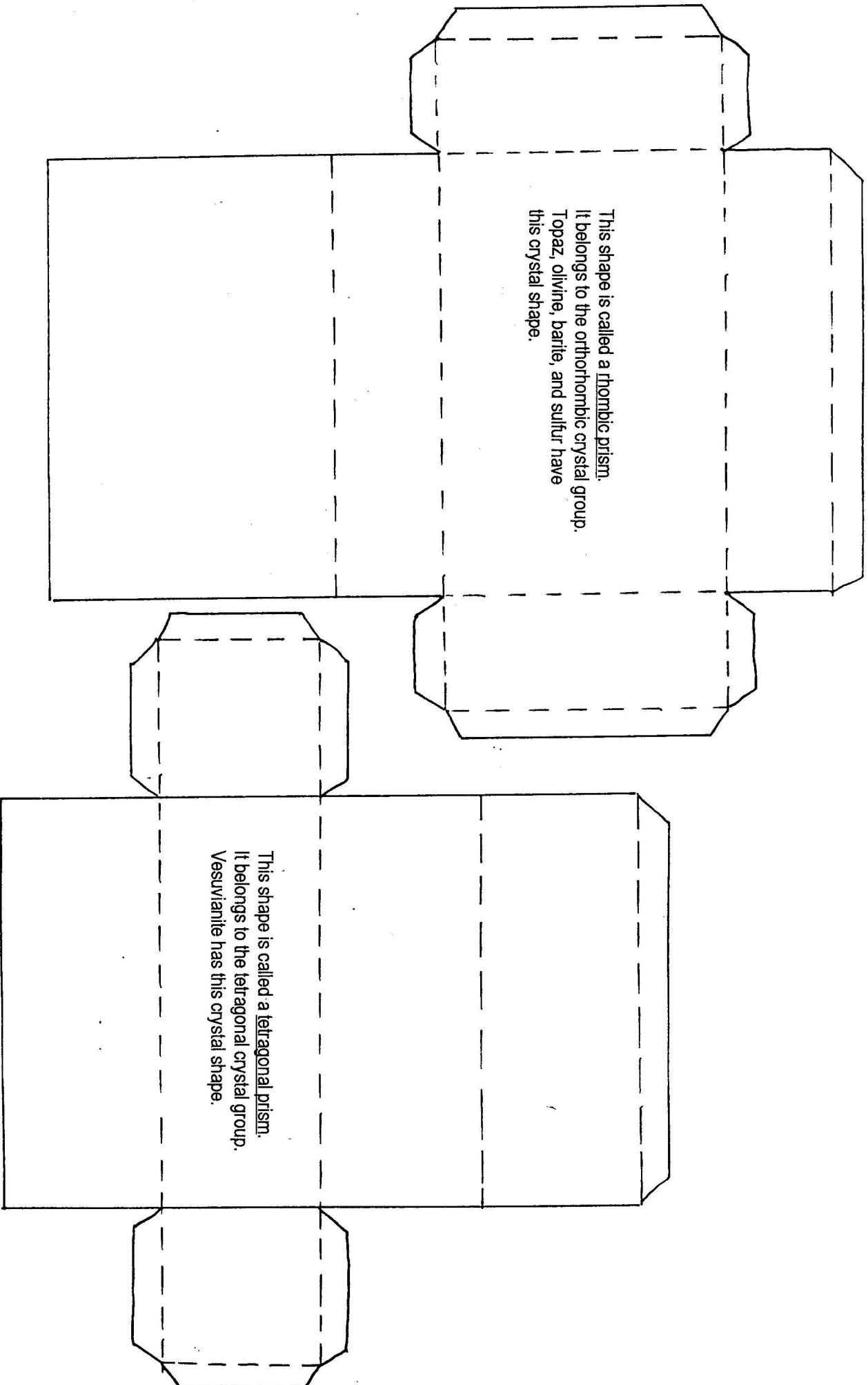
Cut on the solid lines. Fold on the dashed lines.



This shape is called a monoclinic prism.
It belongs to the monoclinic crystal group.
Orthoclase, gypsum, azurite and
malachite have this crystal shape.



Cut on the solid lines. Fold on the dashed lines.



Cut on the solid lines. Fold on the dashed lines.