



## TIPS

There are a variety of ways to get to the finished product. Below is only one suggestion. Remember, students will have to learn to make one of these for themselves, which will not be a problem, since many students will know how to already. What is important is for this activity to be used as an instructional tool for students to learn correct mathematical language of geometry. In the directions below, unit vocabulary words are in small caps. The directions are for starting with an  $8\frac{1}{2}$ -inch square, which will work well for students to use. Using the puppet as a tool means giving the directions to students in mathematical terms, and letting them name the parts of the three-dimensional puppet often. Have them locate a face (not the face of the puppet, the face of the three-dimensional object), an edge, and the three ways it can be measured. Ask them, "Why is this a face? Why is this an edge?" Listen for the correctness of the response to check for understanding of these terms.

## CHATTER BOX

Begin with an  $8\frac{1}{2}$ -inch SQUARE of paper. To find the center POINT, fold in half, bottom to top, having the top and bottom SIDES even, crease the EDGE, open flat. Fold in half in the other direction, side to side, having the right and left SIDES even, crease the EDGE, open flat. Locate the center POINT. Fold each VERTEX in to meet at the center POINT, creasing each EDGE. Now there is a smaller SQUARE. Keeping the VERTICES folded to the center POINT, turn the smaller SQUARE over. Again, fold each VERTEX in to meet at the center POINT, creasing the EDGES. There is an even smaller SQUARE, now. Here we go. This is where TWO-DIMENSIONAL shapes are left behind and by lifting and pushing inward a THREE-DIMENSIONAL object forms. Lift this smallest SQUARE as it is folded, and re-fold along the horizontal and vertical EDGES used to find the center POINT, pushing inward until your fingers all meet and touch. It is like four TRIANGLES joining together to share a mutual base. Keep the VERTICES together where they meet at the top, but TRIANGULAR shapes still pointing outward, by pinching them together with the fingertips of one hand. Use the other hand to lift each of four VERTICES at the bottom of the object, creating the FACES of this THREE-DIMENSIONAL figure. Place thumbs and forefingers under each of the four FACES. By moving the fingers, the puzzle pulsates in and out, back and forth. To make it a puppet, put fingers of one hand in place (as looking from the underside, pinky and ring finger in lower left quadrant, thumb in lower right quadrant, forefinger in top right quadrant, and middle finger in top left quadrant). With fingers in place, hold the figure sideways, and a mouth is very obvious. Tape or glue the top EDGES together and then do the same for the two bottom EDGES. This will keep the forehead and chin from separating while he is talking. Create a puppet face by drawing or attaching ornamental features.