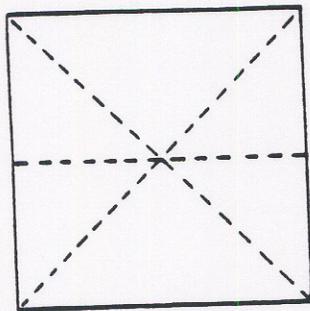# PAPER BOX

Inquiry 3: How can a square sheet of paper be folded to form a box?
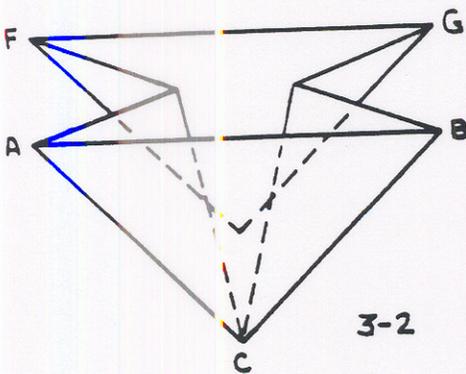
Materials: square sheet of paper, ruler

Action:

Cube

(a) Use a square piece of paper 8" x 8", or bigger. Measure the length of a side.

(b) Fold the diagonals and a horizontal crease through the center. The fold across the center should be a "mountain" fold and that of the corner-to-corner folds valley folds.
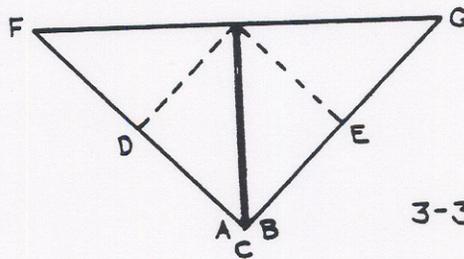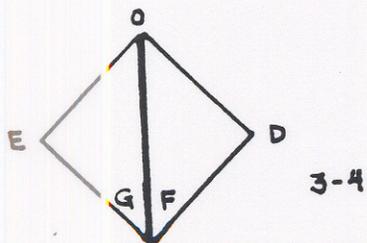

3-1

(c) Let the paper fold naturally into shape as shown in Figure 3-2.

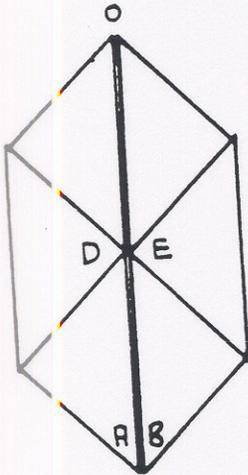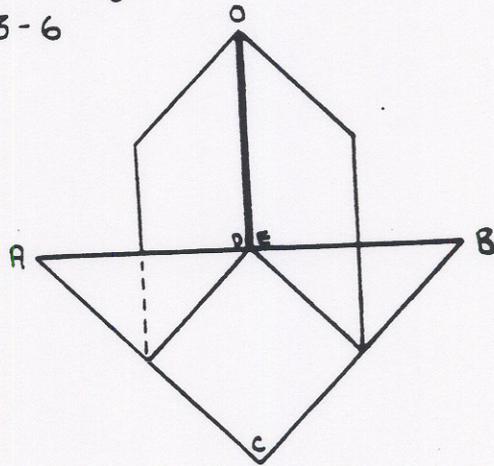(d) Fold the front A and B (Figure 3-3) down to point C.

3-2

3-3

3-4

(e) Turn it over and do the same for the back corners, F and G. A smaller square results Figure 3-4.

(f) The corners on the sides D and E are now double. Fold the corners D and E so that they meet in the center. Turn the square over and do the same for the corners on the back side Figure 3-5.

(g) One end of the Figure 3-5 will now be free of loose corners. Fold the loose corners on the opposite end A and B outward on the front to form Figure 3-6. Do this for the corresponding corners on the back.

(h) Fold the points A and B inward to the center. Do the same with the points on the back of the form Figure 3-7.

(i) Open out the folds D and E and tuck the triangles LAM and NBP into the pockets in D and E. Do the same with the points on the back Figure 3-8.
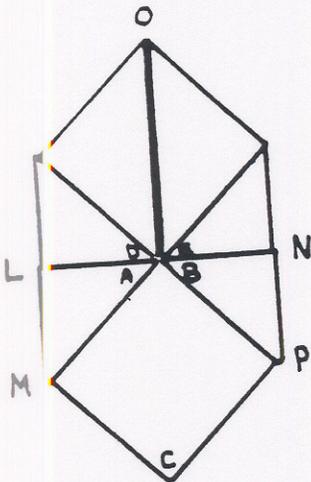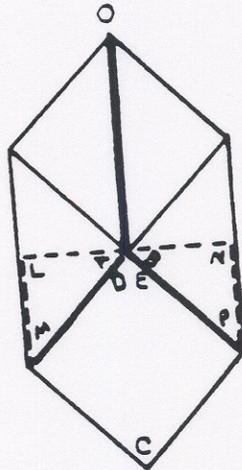
(ENLARGED SCALE FROM PRECEDING PAGE)

3-6

3-5

3-7

3-8

(j) Fold both ways sharply along lines $\overline{MP}$ and $\overline{RS}$. Figure 3-9.

(k) Blow sharply into the small hole found at 0 and the cube will inflate. Crease the edges and the cube is finished Figure 3-10.

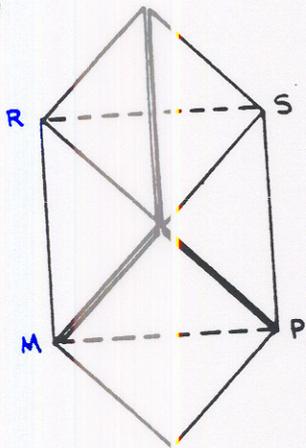(l) Measure the dimensions of the cube.

How do the dimensions of this cube compare with the original square sheet of paper?

What is the volume of this cube if the square sheet was 8 by 8 inches?

Application:

3. What is the smallest size of a square sheet needed to wrap a 2 x 2 x 2 inch box?

3-9

3-10