



## Broken Squares

*Developed in the field by educators affiliated with NSRF.*

### **Broken Squares Group Instruction Sheet**

Each of you has an envelope, which contains pieces of cardboard for forming squares. When the facilitator signals to begin, the task of your group is to form five squares of equal size. The task will not be complete until each member of the group has before them a perfect square of the same size.

There are two specific limitations that are imposed upon your group during this exercise:

1. No member may speak.
2. No member may ask another member for a piece or in any way signal that another person is to give them a piece. (Group members may voluntarily give pieces to other members!)

### **Broken Squares Observer/Judge Instruction Sheet**

Your job is part observer and part judge. AS a judge, you should make sure each participant observes the following rules:

1. There is to be no talking, pointing, or any other kind of communicating.
2. Participants may give pieces directly to other participants but may not take pieces from other members.
3. Participants may not put their pieces in the center for others to take.
4. It is permissible for a member to give away all the pieces of their puzzle, even if they have already formed a square.

As an observer, look for the following:

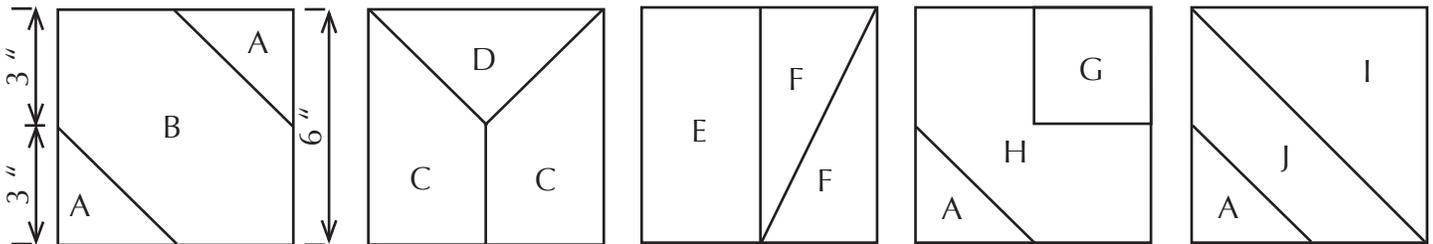
1. Who is willing to give away pieces of the puzzle?
2. Does anyone finish their own puzzle and then withdraw from the problem solving?
3. Is there anyone who struggles with their pieces, yet is unwilling to give any or all of them away?
4. How many people are actively engaged in putting the pieces together?
5. What is the level of frustration and anxiety?
6. Is there any turning point at which the group begins to cooperate?
7. Does anyone try and violate the rules by talking or pointing as a means of helping fellow members solve the problem?



## Directions for Making a Set of Broken Squares

A set consists of five envelopes containing pieces of cardboard cut into different patterns which, when properly arranged, will form five squares of equal size. One set should be provided for each group of five persons.

To prepare a set, cut five cardboard squares, each exactly 6" x 6". Place the squares in a row and mark them as below, penciling the letters lightly so they can be erased.



The lines should be drawn so that, when the pieces are cut out, those marked A will be exactly the same size, all pieces marked C the same size, etc. Several combinations are possible that will form one or two squares, but only one combination will form all five squares, each 6" x 6". After drawing the lines on the squares and labeling the sections with letters, cut each square along the lines into smaller pieces to make the parts of the puzzle.

Label five envelopes 1, 2, 3, 4, and 5. Distribute the cardboard pieces into the five envelopes as follows:

- Envelope 1 contains pieces I, H & E
- Envelope 2 contains pieces A, A, A & C
- Envelope 3 contains pieces A & J
- Envelope 4 contains pieces D & F
- Envelope 5 contains pieces G, B, F & C

Erase the penciled letter from each piece and write, instead, the number of the envelope it is in. This makes it easy to return the pieces to the proper envelope, for subsequent use, after a group has completed the task.

Each set may be made from a different color of cardboard.