## Quarks-Getting Down to Fundamentals

STUDENT ACTIVITY—PART I

## MAKING ARRANGEMENTS

Arranger $\qquad$ Recorder $\qquad$

1. You should have the following set of squares to work with:

3 squares labeled "red up" and 3 labeled "red down"
3 squares labeled "blue up" and 3 labeled "blue down"
3 squares labeled "green up" and 3 labeled "green down"
Using this set of squares, make as many different combinations of three squares as you can. Consider each square as being different from all the others, even if they are the same color and have the same "up" or down" labels. Using lists, word descriptors or drawings, record your findings here.
2. How many combinations of three squares can you make if each group must have two "up" squares and one "down" square? Record your findings here.
3. How many combinations of three squares can you make if each group must have two "down" squares and one "up" squares? Record your findings here.
4. How many combinations of three squares can you make if each combination must have one red, one green, one blue, two "down" squares and one "up" square? Record your findings here.
5. How many combinations of three squares can you make if each combination must have one red, one green, one blue, two "up" squares and one "down" square? Record your findings here.
6. If an "up" square has an elementary electric charge of $+2 / 3$ and a "down" rectangle a charge of $-1 / 3$, which combination of squares that you made in either \#4 or \#5 above has an overall charge of +1 ? Which combination would have a net charge of 0 ?

