Geo Gardens

Part 1

Susan wants to make a garden so that she can grow some of her own vegetables: tomatoes, lettuce, cucumbers, and green peppers. How many ways can Susan lay out her garden?

- Work with a partner. First enclose all 25 pegs on the Geoboard with one rubber band to represent the shape and size of Susan's garden.
- Then divide the Geoboard garden into fourths in as many ways possible. Represent the areas allotted to the 4 crops according to the following rules:
  - The garden must be partitioned into fourths that are all congruent to each other.
  - Be sure that your solutions are all different, not just reflections or rotations of one another. Changing the location of crops does not create a different solution.
- Record each solution on Geodot paper.
- Be prepared to explain how you know your solutions illustrate fourths.

Part 2

What if... ***in addition to the four original crops, Susan decides to grow four new crops: radishes, onions, red peppers, and carrots? How should Susan lay out the 8 crops she will plant in her garden?***

- Work with a partner. Enclose all 25 pegs on the Geoboard with one rubber band to represent the shape and size of Susan's garden.
- Try to find several different ways to divide the Geoboard garden into *congruent* eighths to represent the areas allotted for the 8 crops.
- Record each of your solutions on Geodot paper.
- Now try to find several different ways to partition the Geoboard into 8 different *noncongruent* sections that have equal areas.
- Again, record each of your solutions on Geodot paper.
- Be prepared to justify your solutions and explain how you know that the shapes are either congruent or noncongruent.

What do you notice about the perimeter of the garden layouts? Suppose Susan wanted to build a fence around each type of crop. Using one of your layouts from Part 2, write a note to Susan explaining anything that she may need to know before she builds the fence.