Section 1.2 Problem Solving with *Look for a Pattern, Make a Table, or Solve a Simpler Problem*

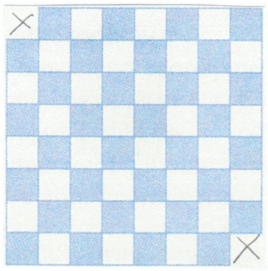
Using Polya's four steps for problem solving and one of the strategies listed above, solve one of the problems below. Your group will present your solution to the class.

1. If the terms of the Fibonacci Sequence (1, 1, 2, 3, 5, 8, 13, …) are squared and then added as shown, an interesting pattern emerges.

$$1^2 + 1^2 = 2$$
$$1^2 + 1^2 + 2^2 = 6$$
$$1^2 + 1^2 + 2^2 + 3^2 = 15$$
$$1^2 + 1^2 + 2^2 + 3^2 + 5^2 = 40$$

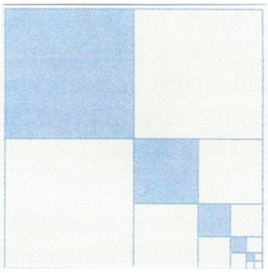
Using this pattern, predict the following sum without performing the addition.

2. We cut two corner squares to form a 8 by 8 checker board to obtain the following figure. Can this new board be exactly covered by 31 dominoes which measure 2 by 1? (Note: You cannot cut any of the dominoes.)



3. An n-by-n-by-n cube was painted on all faces and then cut apart into n^3 1-by-1 cubes. How many 1-by-1-by-1 cubes had no faces painted? How many had one face painted? How many had three faces painted? How many had four faces painted?

4. For the square below, what fraction of the large square region is shaded? Assume that the pattern of shading continues forever.



5. If the following pattern is continued, how many letters will be in the "M" column?

		X	…
	Y	X	…
Z	Y	X	…
	Y	X	…
		X	…

6. Alice purchased 30 square blocks and enclosed a rectangular garden area. Each square block measures 1 foot by 1 foot. How many distinct ways can Alice arrange the blocks to enclose the garden and which arrangement gives her the largest garden area? An example is given: