<u>1.1  Problem Solving</u>

"It is important to approach problem solving with the attitude of meeting an intellectual challenge rather than finishing a menial task."

Polya's steps for Problem Solving

1.

2.

3.

4.

Problem-solving Strategies:

1.  Guess and Test

2.

3.

4.

5.

6.

7.

8.

Questions that encourage investigation and create deeper understanding:

1. Why? (or why not?)

2.  What if...?

3.   What patterns do I notice?

4.  What predictions can I make?

5. How is this like (or different)...?

6. Will that always work?

7.  Can I do it another way?

8.  What other related problems might I explore?

Ex 1:     SUN

       + FUN
      ‾‾‾‾‾‾‾‾
       SWIM

Ex 2:  Find the sum  1 + 2 + 3 + ...  + 100.

Ex 3:      Five friends decided to give a party and split the costs equally.  Al spent $4.75 on invitations, Betty spent $12.00 for drinks and $5.25 on vegetables, Carl spent $24.00 on pizza, Dani spent $6.00 on paper plates and napkins, and Ellen spent $13.00 for decorations.  Determine who owes money to whom and how the money can be paid.

Ex 4:   An elevator stopped at the middle floor of a building.  It then moved up 4 floors, stopped, moved down 6 floors, stopped, and then moved up 10 floors and stopped.  The elevator was now 3 floors from the top floor.  How many floors does the building have?

Ex 5:   We need exactly four gallons of water, but we only have a 5-gallon container and a 3-gallon container, with no measuring marks.  How can you use those two containers to measure exactly four gallons?

Ex 6:   Find three consecutive Natural numbers whose sum is 78.

Ex 7:  Arrange 10 people such that there are five rows each containing four people.

Ex 8:  Show why 3 always divides evenly into the sum of any three consecutive whole numbers.

Ex 9:  Find the sum  58 + 59 + ...  + 203.