

**HOMEWORK: 1, 3, 5, 9 – 21 odd, 29, 31, 33, 37, 39, 45**

**OBJECTIVES:**

- ❖ State the closure property of whole numbers
  - ❖ Classify and use whole number operations
  - ❖ Make a pictorial model for arithmetic algorithms
  - ❖ Employ procedures for estimation and mental computation
1. **Addition:** If the set A contains a elements, set B contains b elements and  $A \cap B = \emptyset$ , then  $a + b$  is the number of elements in the set  $A \cup B$ . In an addition equations,  $a + b = c$ , a and b are called **addends** and c is called the **sum**.
  2. **The closure property of addition of whole numbers:** If a and b are whole numbers, then  $a + b$  is a unique whole number. This says that anytime you add two whole numbers you get another whole number. The unique property means that there is only one possible answer for the sum of any two whole numbers.
  3. **Subtraction:** For any whole numbers a and b,  $a - b = c$  if and only if  $a = b + c$  for a unique whole number c. In the subtraction equation c is called the **difference**. See diagram p. 115.
  4. Types of problems:
    - A. Combine Groups: Michelle has 7 pencils, Tom has 4. How many pencils do they have all together?
    - B. Take Away a Group: I have 20 apples. I use 16 to make applesauce, how many do I have left?
    - C. Combine Measures: I ran 3 miles on Saturday and 2 miles on Sunday. How far did I run this weekend?
    - D. Take Away a Measure: I bought a 5-foot roll of ribbon. I used 3 feet to make a bow. How much ribbon is left?
    - E. Compare Groups: I have 30 pairs of shoes, my husband has 4. How many more pairs of shoes do I have than my husband does?
    - F. Compare Measures: I am 5 feet 7 inches tall, my daughter is 4 feet 10 inches tall. How much taller am I than my daughter?
    - G. Missing Part (Group) : & Missing Part (Measures) (Example given in worksheet)

5. **MODELING ARITHMETIC (ADDITION)**

A. Using colored blocks, disks, etc.

Use the two-color counters to model the following addition problems.

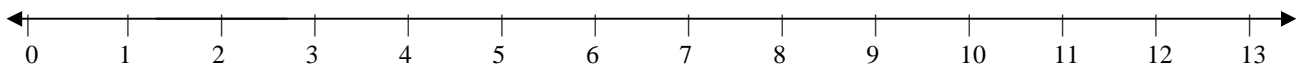
i.  $2 + 3$

ii.  $4 + 5$

Draw a model of your use of the two-color counters here:

B. Number line method

Use the given number line to perform the following addition problems.



i.  $2 + 3$

ii.  $4 + 5$

C. Memory Aids: My daughter's 1<sup>st</sup> grade teacher used this poem.

"So much addition – how can we do it all? Just start with the big and count on the small."

i.  $7 + 4$

ii.  $8 + 5$

D. Using the Near Doubles Strategy. Double facts occur when both addends are the same number. Children master their doubles facts easily, then they can be used to compute near doubles.

i. 
$$\begin{array}{r} 7 \\ + 6 \\ \hline \end{array}$$

ii. 
$$\begin{array}{r} 7 \\ + 7 \\ \hline \end{array}$$

iii. 
$$\begin{array}{r} 7 \\ + 8 \\ \hline \end{array}$$

6. **MODELING ARITHMETIC (SUBTRACTION)**

A. Take-away method

i. Using blocks etc., you can remove the number of objects you want to subtract.

a.  $5 - 4$

b.  $5 - 3$

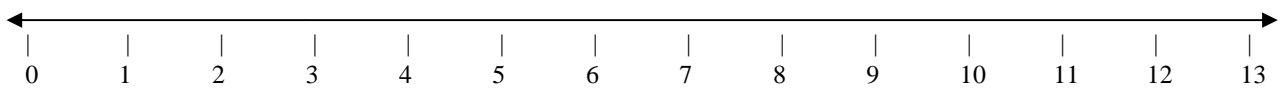
ii. Using a picture, you can cross out the number of objects you want to subtract.



$13 - 8$

B. Number Line Method

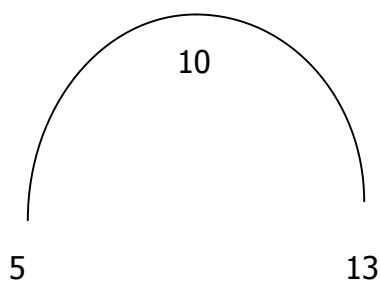
Use the given number line to perform the following subtraction problems.



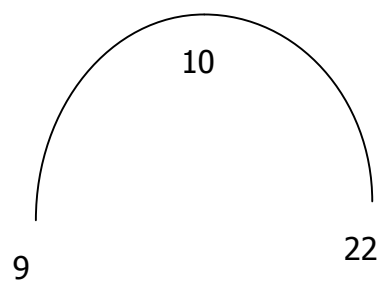
ii.  $13 - 5$

ii.  $9 - 6$

C. Over the Hill method: A counting-on strategy for subtraction.



Solve  $13 - 5 =$

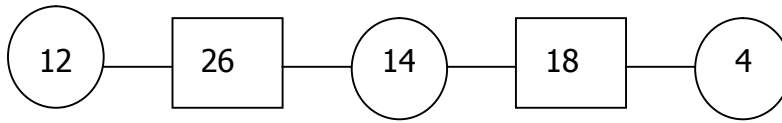


Solve  $22 - 9 =$

What added to 5 equals 10? Fill this in on the left side of the hill.  
What added to 10 equals 13? Fill this in on the right side of the hill.

Add the numbers on the sides of the hill. That is your difference.

7. Investigate Number Chains (p. 118)



$$26 - 12 = 14$$

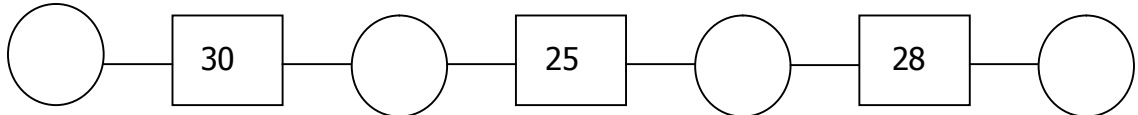
$$18 - 14 = 4$$

$$26 - 14 = 12$$

$$18 - 4 = 14$$

$$12 + 14 = 26$$

$$14 + 4 = 18$$



If we start this chain with 12, what will the other entries be?

Start the chain with X, write the other entries in terms of X. What did you notice about the first and last circles?

Can you find two solutions for the following chain? Start the chain with X in the upper-left-hand circle and use algebra to fill in all the circles.

