Integer Models

EXAMPLE:

Johnny used to cheat, fight and swear. Then he stopped cheating and fighting. How many negative traits did he used to have? _____ How many negative traits did he get rid of? _____ How many negative traits does he still have? _____

Write an integer equation showing how Johnny got rid of some negative traits:

_____

EXAMPLE:

We all use credit cards to use money we don't have. Then we "undo" the debt when we make a payment or pay off that amount. Betty charged two pair of shoes that were on sale for $49.99 each on her new Macy's charge card. At the end of the month she made a minimum payment of $25 on her bill.

Write an integer equation showing Betty's purchases and payments:

_____

Integer 2-color Counter Model

These 2-color counters come with red on one side and yellow on the other. We use the yellow side to represent +1 and the red side to represent -1. Placing a number of counters, either yellow side up or red side up can model an integer number. Operations can also be modeled, sometimes involving adding **zero pairs**. A zero pair is a red and yellow counter together. Their value is "0" because they cancel each other out. In some operations we can add as many zero pairs to the problem as necessary to model the operation.

EXAMPLE: zero pair (value of zero)

EXAMPLE: Model 7

EXAMPLE: Model -4

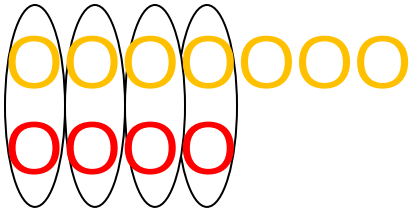
OO
OO

ADDITION EXAMPLE: (join 2 sets)

7 + -4 = -3

OOOOOOO
OOOO

Notice this operation makes four zero pairs, leaving 3 yellow counters

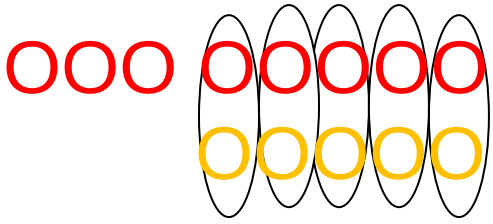


SUBTRACTION EXAMPLE: (model first set, remove second set amount)

-3 – 5 = -8

OOO

Notice that we don't have 5 yellow (positive) counters to remove. So we add in as many zero pairs as needed (how many do we need for this problem?).



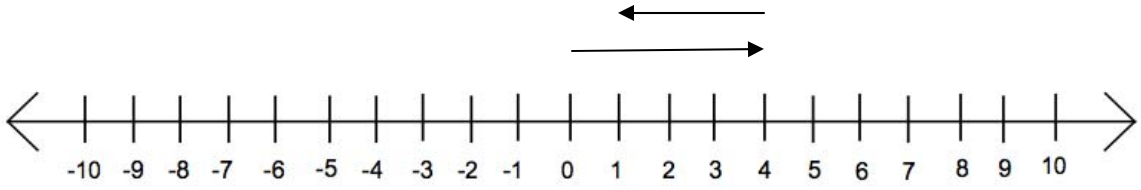
Now we can remove 5 yellow counters to get -8

OOO OOOOO

Number line model

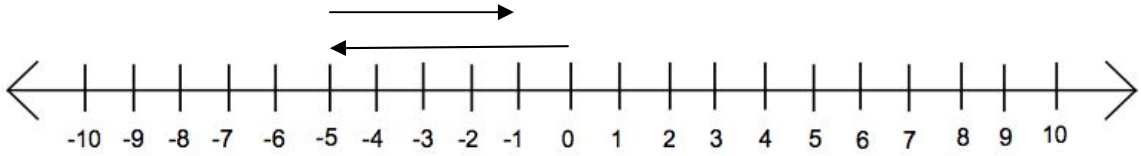
We use directed arrows to model addition and subtraction of integers on the number line. For addition, draw a directed arrow for the first number value, starting from zero. Draw the directed arrow for the second number above, starting from the arrow end of the first number.

EXAMPLE: Demonstrate 4 + -3 = -1 using the number line model



Remember that subtraction is the opposite of addition. Adding points the directed arrow in the same direction as its positive or negative value. Subtraction will point the directed arrow the opposite way. It can get tricky when subtracting a negative number, as the directed arrow changes direction for both the negative number and the operation.

EXAMPLE: Demonstrate -5 – (-4) = -1 using the number line model

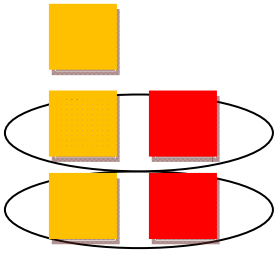


Notice the second number (-4) would be modeled pointing left, but since it is being subtracted, it goes in the opposite direction.

Integer stack model

This model is similar to the 2-color counter model; however it uses square color chips stacked in TWO vertical columns (one for positive, one for negative). When the integers are the same sign, place or remove from the same stack. If the integers are of different signs, place/draw the square tiles in TWO vertical columns. Use colors to distinguish positive and negative numbers. Identify any zero pairs by circling them; read the answer by number and color.

EXAMPLE: Model 3 + (-2) = 1 using the stack model



EXAMPLE: Model -1 – 4 = -5