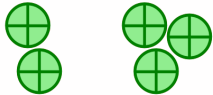
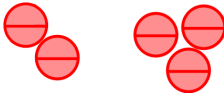
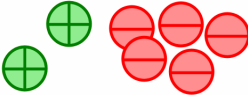
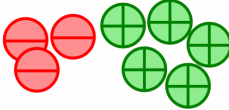
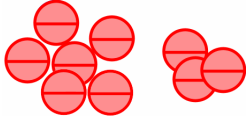
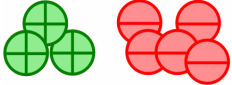
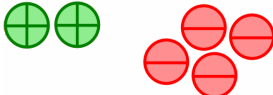
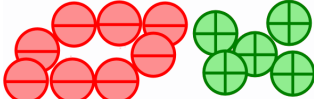


Adding Integers: Counters

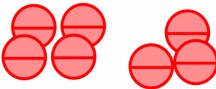
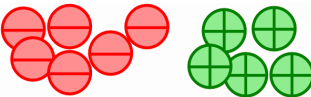
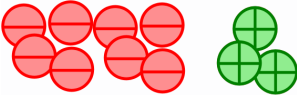
Addition of integers can be modeled using **counters**. We will use red counters with a “+” sign for positives and blue counters with a “-” sign for negatives.

 Here we have the sum $2 + 3$. There is a group of 2 positives and another of 3 positives.	 This picture shows the sum $(-2) + (-3)$. We <i>add</i> negatives and negatives. In total, there are five negatives, so the sum is -5.	 $+ \quad$  $= 0$ $1 + (-1) = 0$ One positive counter and one negative counter <i>cancel</i> each other. In other words, their sum is zero!
 $2 + (-2) = 0$ Two negatives and two positives also cancel each other. Their sum is zero.	 $3 + (-1) = 2$ Here, one “positive-negative” pair is canceled (you can cross it out!). We are left with 2 positives.	 $(-4) + 3 = -1$ Now the negatives outweigh the positives. Pair up three negatives with three positives. Those cancel out. There is still one negative left.

1. Refer to the pictures and add. Remember each “positive-negative” pair is canceled.

 a. $2 + (-5) = \underline{\hspace{2cm}}$	 b. $(-3) + 5 = \underline{\hspace{2cm}}$	 c. $(-6) + (-3) = \underline{\hspace{2cm}}$
 d. $3 + (-5) = \underline{\hspace{2cm}}$	 e. $2 + (-4) = \underline{\hspace{2cm}}$	 f. $(-8) + 5 = \underline{\hspace{2cm}}$

2. Write addition sentences (equations) to match the pictures.

 a.	 b.	 c.
 d.	 e.	 f.

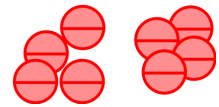
A note on notation

We can write an elevated minus sign to indicate a negative number: $\bar{4}$.

Or we can write it with a minus sign and parentheses: (-4) .

We can even write it without the parentheses if the meaning is clear: -4 .

So $\bar{4} + \bar{4} = \bar{8}$ is the same as $(-4) + (-4) = (-8)$, which is the same as $-4 + (-4) = -8$



You **should** write the parentheses if you have $+$ and $-$, or two $-$ signs, next to each other.

So, do not write “ $8 + - 4$ ”; write “ $8 + (-4)$.” And do not write “ $3 - -3$ ”; write “ $3 - (-3)$.”

3. Think of the counters. Add.

a. $7 + (-8) =$ $(-7) + 8 =$	b. $(-7) + (-8) =$ $7 + 8 =$	c. $5 + (-7) =$ $7 + (-5) =$	d. $50 + (-20) =$ $10 + (-40) =$
e. $\bar{2} + \bar{4} =$ $\bar{6} + 6 =$	f. $10 + \bar{1} =$ $\bar{10} + \bar{1} =$	g. $\bar{8} + 2 =$ $\bar{8} + \bar{2} =$	h. $\bar{9} + \bar{1} =$ $9 + \bar{1} =$

4. Rewrite these sentences using symbols, and solve the resulting sums.

- The sum of seven positives and five negatives.
- Add -3 and -11 .
- Positive 100 and negative 15 added together.

5. Write a sum for each situation, and solve.

- Your checking account is overdrawn by \$50. (This means your account is negative). Then you earn \$60. What is the balance in your account now?
- Hannah owes \$20 to her mom. Then, she borrows \$15 more from her mom. What is Hannah's “balance” now?

6. Consider the four expressions $2 + 6$, $(-2) + (-6)$, $(-2) + 6$, and $2 + (-6)$. Write these expressions in order from the one with **least** value to the one with **greatest** value.

7. Find the number that is missing from the equations.

a. $-3 + \underline{\hspace{2cm}} = -7$	b. $-3 + \underline{\hspace{2cm}} = 3$	c. $3 + \underline{\hspace{2cm}} = (-7)$
d. $\underline{\hspace{2cm}} + (-15) = -22$	e. $2 + \underline{\hspace{2cm}} = -5$	f. $\underline{\hspace{2cm}} + (-5) = 0$