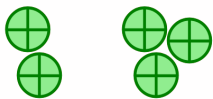
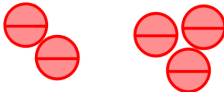



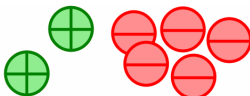
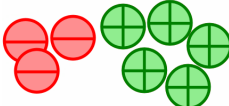
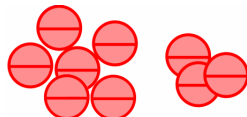
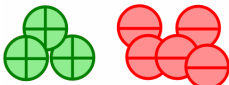
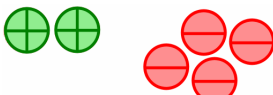



Adding Integers: Counters

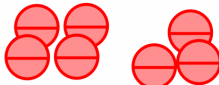
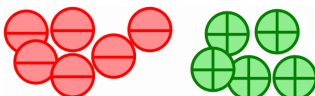


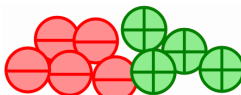
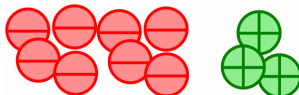
Addition of integers can be modeled using **counters**. We will use red counters with a “+” sign for positives and blue counters with a “-” sign for negatives.

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

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

 <p>a. $2 + (-5) = \underline{\quad}$</p>	 <p>b. $(-3) + 5 = \underline{\quad}$</p>	 <p>c. $(-6) + (-3) = \underline{\quad}$</p>
 <p>d. $3 + (-5) = \underline{\quad}$</p>	 <p>e. $2 + (-4) = \underline{\quad}$</p>	 <p>f. $(-8) + 5 = \underline{\quad}$</p>

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

 <p>a.</p>	 <p>b.</p>	 <p>c.</p>
 <p>d.</p>	 <p>e.</p>	 <p>f.</p>

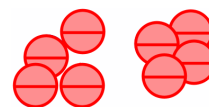
A note on notation

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. $\underline{\hspace{2cm}} + (-5) = 0$