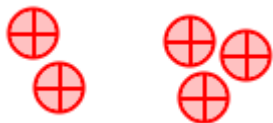


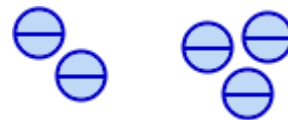
Adding Integers 1: Counters

Addition of integers can be modeled using counters.

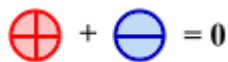
We'll use red counters with a "+" sign for positives and blue counters with a "-" sign for negatives.



This picture shows the addition, $2 + 3$. There is one group of 2 positives and another group of 3 positives. The sum is simply 5.



This picture shows the addition, $(-2) + (-3)$. We *add* negatives and negatives. All totaled there are five negatives, so the sum is -5 .



$$1 + (-1) = 0$$

One positive counter and one negative counter *cancel* 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.



$$3 + (-1) = 2$$

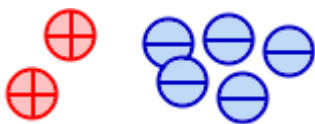
Here, one "positive-negative" pair is canceled, and we are left with 2 positives.



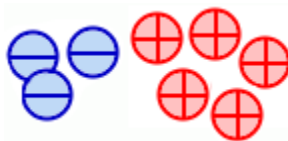
$$(-4) + 3 = -1$$

Now the negatives outweigh the positives. Pair up three of each, and there is still one negative left.

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



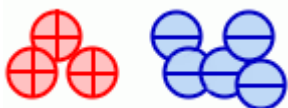
a. $2 + (-5) = \underline{\hspace{2cm}}$



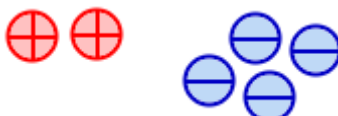
b. $(-3) + 5 = \underline{\hspace{2cm}}$



c. $(-6) + (-3) = \underline{\hspace{2cm}}$



d. $3 + (-5) = \underline{\hspace{2cm}}$

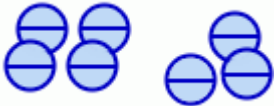
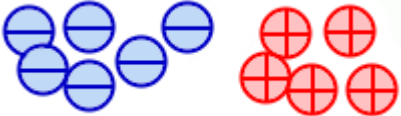

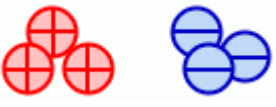
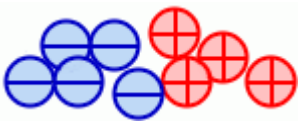



e. $2 + (-4) = \underline{\hspace{2cm}}$



f. $(-8) + 5 = \underline{\hspace{2cm}}$

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

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

3. Rewrite these sentences using symbols, and solve the resulting addition problems.

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

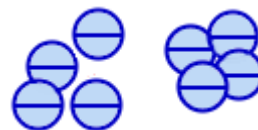
A note on notation

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

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 $^{-}4 + ^{-}4 = ^{-}8$ 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 don't write " $8 + - 4$ "; write " $8 + (-4)$." And don't write " $3 - -3$ "; write " $3 - (-3)$."

4. Think of the counters. Add.

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

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

<p>a. $(-3) + \underline{\hspace{2cm}} = (-7)$</p>	<p>b. $(-3) + \underline{\hspace{2cm}} = 3$</p>	<p>c. $3 + \underline{\hspace{2cm}} = (-7)$</p>
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