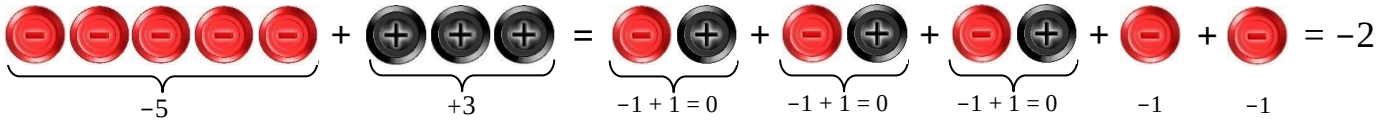
Check Your Answers on Integer Operations!

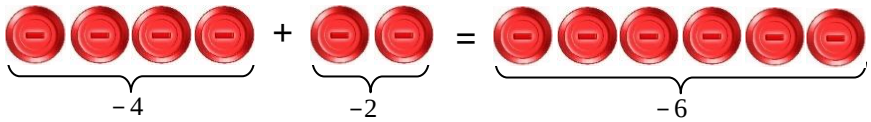
There are a number of methods used to teach operations with integers and eventually operations with all real numbers from movement on the number line to memorizing specific rules. A more visual approach has been presented here, using students' understanding that being "in the red" indicates an amount owed and being "in the black" indicates a positive amount available for use, the preferred bottom line in business. Based on these concepts, a black chip or circle will represent +1 and a red chip or circle will represent −1. Manipulatives such as checkers can easily be used to mirror the processes presented.

Regroup using the Commutative Property:

1. −2



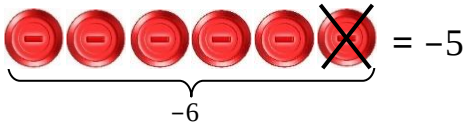
2. −6



No need to memorize rules when you can visualize the combination!

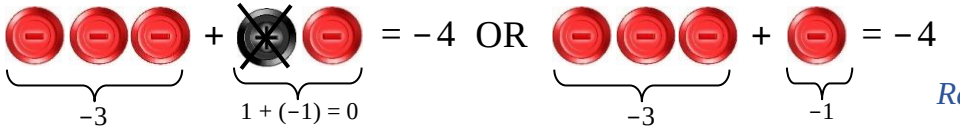
3. −5

Subtraction is usually introduced as "taking away" the amount to be subtracted. To model (−6) – (−1), begin with 6 red chips. Subtract (−1) by taking away 1 red chip as shown to the right.



4. −4

Begin with 3 red chips to model (−3) – 1. In this case, 1 black chip would be needed to subtract +1. Add one zero which is a black-and-red pair in order to take away 1 black chip.



Do you see why subtraction is often redefined as "adding the opposite"?
(−3) – 1 *could be written as* (−3) + (−1).
Rather than taking away 1 black chip, add 1 red chip.

5. −5

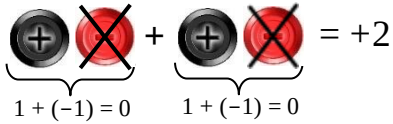
Can you mentally picture those positives and negatives, combining as you regroup, without actually seeing those "chips"?

6. −6

Multiplication is a short-cut for repeated addition. In other words, (−3) times 2 means that (−3) is added 2 times: (−3) + (−3) as shown to the right.

7. 2

If multiplying by a *positive* number indicates the number of times that number is added, then multiplying by a *negative* number would indicate the number of times that number is subtracted. (−2) times (−1) means that (−2) or 2 red chips are taken away (from 0) once.



8. 3

Recall your earliest understanding of division; how many times does −2 "go into" −6? Visualize the number of groups of 2 red chips there are in −6 which is obviously 3.

9. −2

Division is the inverse operation of multiplication. If −8 ÷ 4 is equal to some number, then some number multiplied by 4 (or repeated four times) will equal −8. Can you picture this without using chips?

10. −24

Absolutely correct!!

Perfect score? Yes! You've got this!!