Packet 4: Addition and Subtraction on the Number Line

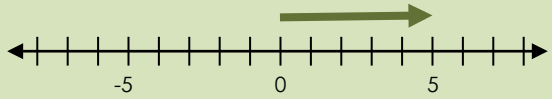
Dear Parents/Guardians,

Packet 4 extends addition and subtraction of integers to non-integer rational numbers using number lines. Addition is straightforward, but subtraction is trickier. We do not want to impose any rules for using the number line when trying to verify the subtraction rule, so we revert to an elementary subtraction technique referred to as "adding up" for student exploration of subtraction on the number line.

Addition on the Number Line

Students will use arrows to represent integers on a number line.

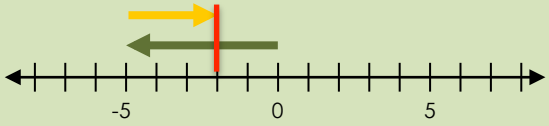
Represent 5.



Represent -5.

When adding, the first arrow begins at zero. The sum is represented by the end position (the tip) of the second arrow.

Represent -5+3.



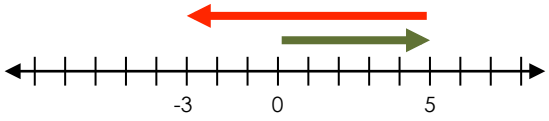
-5 + 3 = -2

Subtraction as "Adding Up" on the Number Line

Subtraction can be thought of as an "adding up" equation.
For example, 7-5 can be thought of as 5 + ____ = 7, or _____ +5 = 7.

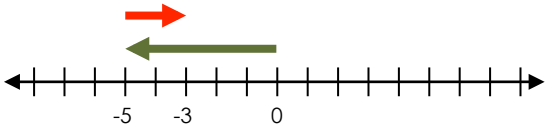
Students rewrite the subtraction integer expressions as "adding up" equations. They use this equation to find the missing length (arrow) to get to the sum. This missing length is also known as the difference.

-3 – 5
Rewrite as an "adding up" equation
____ + 5 = -3



Need an arrow of -8 to move from 5 to -3.
-8 + 5 = -3
-3 – 5 = -8

-3 – (-5)
Rewrite as an "adding up equation
-5 + ____ = -3



Need an arrow of 2 to move from -5 to -3.
-5 + 2 = -3
-3 – (-5) = 2

By the end of the packet, your student should know…

How to represent addition of rational numbers on a number line Lessons 4.1 and 4.3

How to represent subtraction of rational numbers as "adding up" on a number line
Lessons 4.2 and 4.3

The procedural rules for addition and subtraction of rational numbers
Lessons 4.1, 4.2, and 4.3

Additional Resources

Resource Guide (RG)
Part 1, pages 35-39