Using the Number Line

ID1050– Quantitative & Qualitative Reasoning

The Number Line Establishes Order

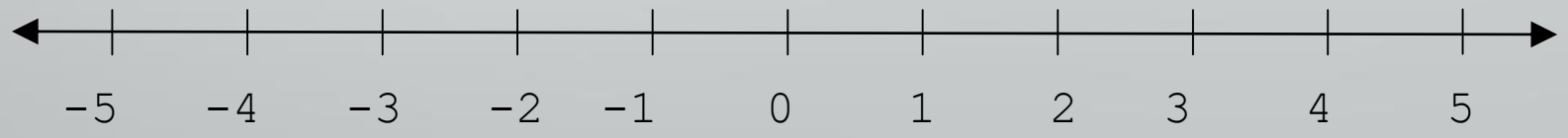
- We need a mathematically precise definition of ‘larger’, ‘smaller’, ‘greater than’, ‘less than’, etc.
- The number line can be used to determine this ordering of numbers
- By definition, a number is smaller than another number if it appears farther left on the number line
- The symbol ‘>’ is read as ‘greater than’, and ‘<‘ is ‘smaller than’
  - The open portion of each symbol opens toward the larger number of the two being compared

Examples Using the '>' and '<' Symbols

- Compare the numbers '3' and '5'. We would write either $3 < 5$ or $5 > 3$
- Compare the numbers '$^{-}2$' and '2'. We would write either $^{-}2 < 2$ or $2 > {}^{-}2$
- Compare the numbers '$^{-}3$' and '$^{-}5$'. We would write either $^{-}5 < {}^{-}3$ or $^{-}3 > {}^{-}5$

The Number Line Can Be Used for Operations

- Adding a positive number means 'move right by that number'
  - What is 3+2? Start at 3 and move right 2 to get 5.
- Subtracting a positive number means 'move left by that number'
  - What is 2−1? Start at 2 and move left 1 to get 1.
- Adding a negative number means 'move left by the size of that number'
  - What is 1+⁻3? Start at 1 and move left 3 to get ⁻2
- Subtracting a negative number means 'move right by the size of that number'
  - What is ⁻5−⁻1? Start at ⁻5 and move right 1 to get ⁻4



Conclusions

- The number line is a way to visually represent abstract concepts like numbers and operations.
- The number line helps define the order of numbers
- We will be using number lines for graphing later in the course.