

CHAPTER 2 : REAL NUMBERS, LESSON 2.1 : IDEA OF NEGATIVE NUMBERS & NUMBER LINE

Pages 25-30 in the textbook

I am assuming given their proficiency, this lesson will be largely review. With negative numbers, you can start by the example of the temperatures outside dropping below 0. Help them to understand that in this case, 0 is an arbitrary value...there is no such thing as negative absolute temperature or negative thermal energy that we could experience. In this case, we have determined 0 to equal a certain value, and just as 10 degrees is 10 degrees more heat than 0, 0 degrees is 10 degrees more heat than -10. In this way, they can hopefully grasp negative numbers through the lens of subtraction. Subtraction in reality is simply the addition of a negative number.

For review, a whole number is 0, 1, 2, 3, 4,

Must be whole (not a fraction, square root, etc), and must be non-negative (0 or positive)

The whole numbers and their negative counterparts, -4, -3, -2, -1, 0, 1, 2, 3, 4, ... are called integers.

1, 2, 3, 4, ... are called positive integers because they exclude 0 and the negative integers. These are what we would most commonly think of numbers intuitively. They are also called natural numbers because they are the ones that we can actually observe in nature (1 star, 2 butterflies, 3 blades of grass, 4 trees).

The Class Activity on page 27 may be a challenging concept at first, but this is all about application. Question 1a is an example of a vector, meaning it involves a quantity and a direction. Because 20 miles is a positive value in an eastward direction, 6 miles west must be thought of as a negative value because it is going in the exact opposite direction. Thus the answer would be -6. Think about it this way--if you travel 20 miles eastward on a road and then turn around and travel 6 miles westward, you will have traveled in total $(20-6) = 14$ miles eastward. Examples 1b and 1c follow from that.

The number line on page 28 should be pretty self-explanatory for them, as well as the inequality signs at the bottom. Tell them to make special note of the "greater than or equal to" and "less than or equal to" signs as those represent something different than just greater than and less than.

Page 29 - absolute value - ALWAYS non-negative. (Note the difference between non-negative and positive is that it includes zero) The absolute value of any negative number is simply its positive counterpart, and the absolute value of 0 remains 0.

Have them work on the examples and "try it" sections on page 30. I will be available to chat on GroupMe, particularly within the hours of 9am to 11am.