24.1 Visualizing Numbers - Worksheet 1

1 Draw a number line from -10 to 10 using increments of 1.

2 Write all 6 mathematical sentences that compare the numbers -4, -7, and 5.

3 Draw a number line and give the approximate locations of the numbers -45, 22, and 65.

4 Write all 6 mathematical sentences that compare the numbers -45, 22, and 65.

5 Give a representation of the relative locations of the numbers 23 and 32 and write 2 mathematical sentences comparing them.

6 Give a representation of the relative locations of the numbers -23 and -32 and write 2 mathematical sentences comparing them.

Remember to think about starting from 0 and moving to these numbers. You should have something different from the previous problem.

24.2 Visualizing Numbers - Worksheet 2

1 Draw a number line from -100 to 100 using increments of 10.

2 Write all 6 mathematical sentences that compare the numbers -60, 0, and 80.

3 Draw a number line from -800 to 600 using increments of 25.

4 Write all 6 mathematical sentences that compare the numbers -750, -625, and -675.

5 Represent the number 34 using base-10 blocks.

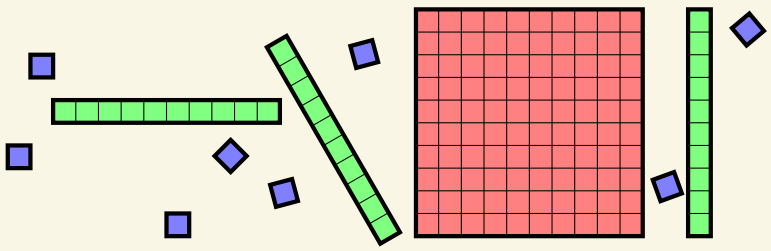
Be sure to draw all 10 squares on the rod. That is an important concept for these diagrams.

24.3 Visualizing Numbers - Worksheet 3

1 Give a representation of the relative locations of the numbers -47 and -83 and write 2 mathematical sentences comparing them.

2 Represent the number 238 using base-10 blocks.

3 What number is represented by the following base-10 blocks?



4 Explain why the above arrangement of base-10 blocks is not ideal. Then give a better arrangement and explain why it's better.

Give at least two reasons your arrangement is better.

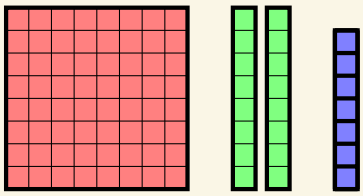
24.4 Visualizing Numbers - Worksheet 4

1 Although we are most familiar with base-10 number, this is not the only system of numbers that is used. Computers have three other number systems that it uses: binary (base-2), octal (base-8), and hexadecimal (base-16). We are going to explore those bases to understand how they work.

The primary difference is that the size of rods and trays are different. When working in base-10, it takes 10 pieces to go up to the next shape. In base-8, it only takes 8. Here is the visual representation of the number 127_8.

The subscript number tells us what base we're in. If there is no subscript, then the number is in base-10.

Determine what this number is in base-10 and explain your logic.



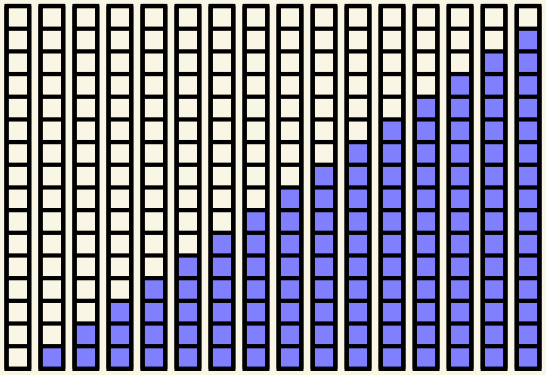
2 Converting numbers from base-10 to base-8 is a bit more complicated. Try to imagine that you have a bunch of loose blocks that you're filling into different trays that are built around the number 8 instead of the number 10. Work from the largest trays and work your way down.

Convert 89 to base-8 and explain your process in words.

3 Using the logic that you developed, convert 14 to base-2 and explain your process in words.

24.5 Visualizing Numbers - Worksheet 5

1 Base-16 requires us to introduce more symbols into our system of digits. The following diagram represents all of the single-digit numbers in that system.



Based on this diagram, what do you think the base-10 representation of 10_{16} is? Explain your logic.

2 Convert AC_{16} to base-10. Explain your reasoning.