**Task Card: The Cube Factory**

You work for a shipping company and your supervisor asks you to design a new set of boxes that are cubes and come in different sizes. She was a math major in college, so she tells you that she wants each side length to be a multiple of 5.

**Step 1:** The engineer that is assigned to build these boxes asks you to tell him the total volume of the boxes. You send him the following expression to represent the volume:

$(5x)^{3}$

He writes back that he needs this expression simplified. You multiply it out and get the following expression:

$$(5x)(5x)(5x)$$

And send it back to him. He replies that he thinks you can simplify it further.

**What expression are you going to send back to him? Justify your answer using the commutative and associative properties of multiplication.**

**Step 2:** The engineer works all night preparing the new boxes, and when your supervisor sees them, she says, “Oh no! These actually need to have side lengths that multiples of 3 – you will have to redo them!” You know that you can find the volume by writing:

$$\left(3x\right)^{3}$$

 Come up with a new simplified expression to send to the engineer.

**Step 3:** You need to explain to a coworker how to come up with these simplified expressions. Explain to her your work using side lengths that are multiples of a different number.