

## Graphical Scalar Multiplication of Vectors

### Today's Standard

HSN.VM.B5a - Represent scalar multiplication graphically by scaling vectors and possibly reversing their direction; perform scalar multiplication component-wise, e.g., as  $c(v_x, v_y) = (cv_x, cv_y)$ .

### Real-World Applications for this Standard

Physics: Calculating the force vector in mechanics.; Computer Graphics: Scaling images and objects.; Engineering: Analyzing stress and strain vectors.; Economics: Modeling economic growth vectors.; Robotics: Controlling movement and direction.

### Today I Learned

Today, we learned about how to make vectors bigger or smaller by multiplying them with a number. This is called scalar multiplication.

### Common Stumbling Blocks

Sometimes, kids might think that multiplying a vector only makes it longer or shorter, but it can also flip its direction. Another mix-up is thinking that scalar multiplication is the same as adding two vectors together, but they are different things.

### Quiz Me

- What happens when you multiply a vector by 2?
- Can a vector change direction when multiplied by a number?
- What is it called when you make a vector bigger or smaller?
- Is multiplying a vector the same as adding two vectors?
- What does a negative number do to a vector?

### Help Me

Multiplying a vector by a number can make it bigger or smaller. This is useful in real life, like when we need to show how fast something is moving or how strong a force is. By understanding this, we can solve many interesting problems.

