

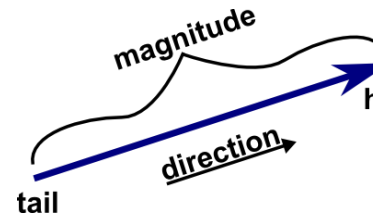
# Vectors and Translations



## What is a Vector?

**Definition:** A **vector** is an object that has both a magnitude and a direction. Geometrically, we can picture a **vector** as a directed line segment, whose length is the magnitude of the **vector** and with an arrow indicating the direction.

- **Vector Town**
- $\langle x, y \rangle$  component form (which represents the vector)
- $(x, y)$  represents the movement



## When would you use vectors in real life?

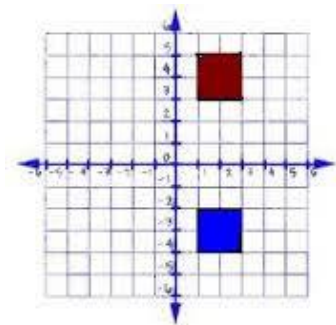
**An example of a vector in real life:** Would be an outfielder in a baseball game moving a certain direction for a specific distance to reach a high fly ball before it touches the ground. The outfielder can't just run directly for where he sees the ball first or he is going to miss it by a long shot. The player must anticipate what direction and how far the ball will be from him when it drops and move to that location to have the best chance of catching the ball.



## What is a Translation?

**Definition: Translation** is a term used in geometry to describe a function that moves an object a certain distance. The object is not altered in any other way. It is not rotated, reflected or re-sized. In a **translation**, every point of the object must be moved in the same direction and for the same distance.

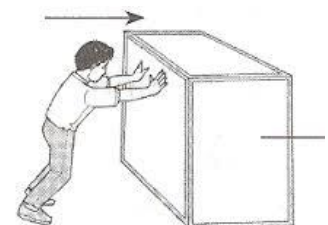
- **Translations**



## When would you use Translations in real life?

**An Example of a Translation in real life:** Would be pushing a box from one side of the room to another.

**Another real life example:** Would be being a construction worker...Let's say you want to relocate a building 2 blocks away.



# The relationship between Vectors & Translations

That is called using a translation. You need to move the building a certain way and distance.

Vectors are used to show the direction and distance an image would be translated to. The translation of the figure would slide all the points in the same direction given by the vector.

