

# INCREASING STUDENT LEARNING THROUGH METAPHORS | SIMILES | ANALOGIES

## HIGH SCHOOL EXAMPLE:

A metaphor to help high school students understand quadratic functions could be a roller coaster ride.

Consider a roller coaster ride: it starts at a certain height (the y-intercept), goes up to a peak (the maximum or minimum point of the parabola), and then comes back down, crossing the ground level at some points (the roots or zeros of the function). The shape of the roller coaster's path is similar to the graph of a quadratic function, which is a parabola.

The equation of a quadratic function,  $y = ax^2 + bx + c$ , can be thought of as the blueprint for the roller coaster. The coefficients 'a', 'b', and 'c' determine the shape and position of the ride. The coefficient 'a' determines whether the ride starts by going upwards (if 'a' is positive) or downwards (if 'a' is negative), 'b' shifts the ride left or right, and 'c' sets the initial height of the ride.

Just like how the thrill of a roller coaster ride depends on its peaks and dips, the key features of a quadratic function such as its maximum or minimum point (the vertex), and where it crosses the x-axis (the roots or zeros), are crucial to understanding its behavior.

This metaphor not only makes the concept more relatable but also helps students visualize quadratic functions and their properties.

## WHEN CONSTRUCTING METAPHORS, BE MINDFUL OF...

- a. **Misinterpretation:** Metaphors are indirect ways of explaining concepts. Make sure students interpret them as intended.
- b. **Relevance:** The effectiveness of a metaphor depends on its relevance. Make sure students see the connection(s) being made.
- c. **Cultural Differences:** Metaphors often rely on cultural context for their meaning. Students from different cultural backgrounds may interpret the same metaphor in different ways. Make sure the metaphor is understood in the way it is intended. Do not assume that students automatically understand it.

When used thoughtfully and appropriately, metaphors can be powerful tools for making complex concepts more accessible and engaging for students.

