# EXPLORING ALGEBRA THROUGH DIAGRAMS AND PICTURES

Algebraic equations are equivalent expressions. Each side of the equals sign represents the same amount. First, in this unit, we will explore algebra equations through diagrams of line segments and write algebraic expressions that represent the length of the line segments. In addition, we will look at the idea of equivalence by using a set of scales, some cubes, and balls to model an algebraic equation.

Exploring Algebra through Diagrams

Describe the lengths of these line segments in two ways, and then write an equation that sets them equal to each other.

Example:
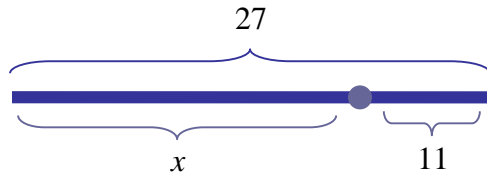
Description One: The blue line segment is 27 units long. $\rightarrow$ 27

Description Two: The blue line segment is x plus 11 units long. $\rightarrow$ $x + 11$

Write an equation setting both expressions equal to each other. $\rightarrow$ $x + 11 = 27$

How much does a cube weigh?

Cubes and balls have been added to the scale shown below. The set of objects on the left side of the scale weigh the same amount as the set of objects on the right side.
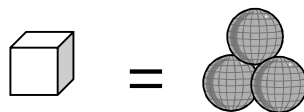
Remove the same amount of types of objects from each side of the scale to determine how much a cube weighs.
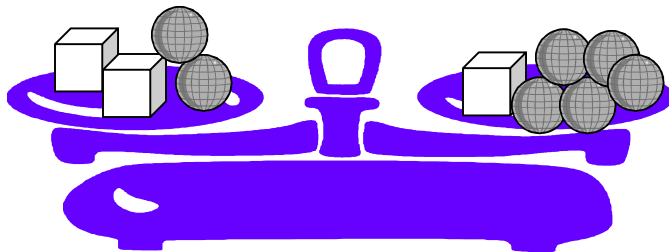
First, remove one block from both sides; then, remove two balls from both sides.
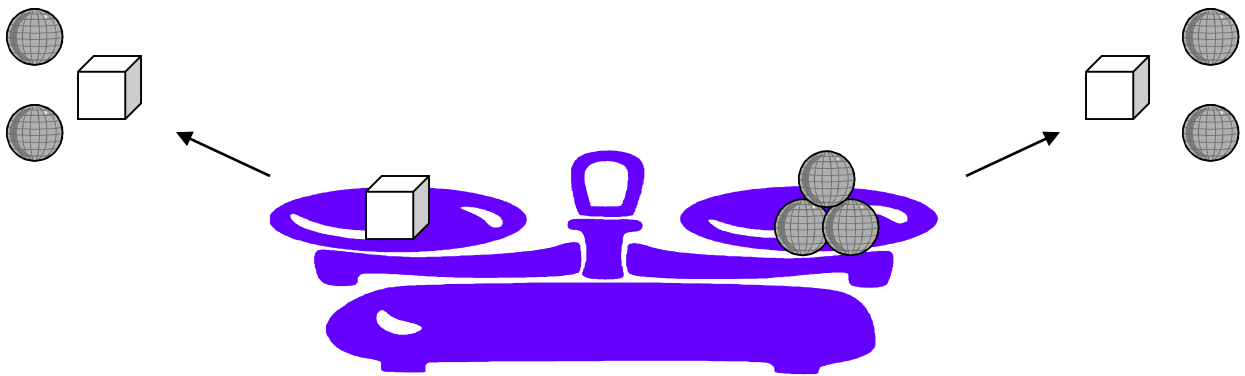
One cube remains on the left side and three balls are on the right side. Thus, one cube equals three balls.

A cube weighs the same as 3 balls.