

Our representation in the spotlight is the equation. This representation has become very familiar to your child over the course of his/her education so far. In early elementary school, your child may have seen equations such as $7 + 4 = 11$ or $5(2 + 1) = 15$. In *A Story of Ratios*, students build upon their previous experiences with various equations: numeric equations (equations with numbers and symbols) and algebraic equations (equations with numbers, symbols and variables), and strengthen their understanding by engaging in problems where they use equations in various situations. This helps develop their abilities to think abstractly and algebraically and creates a strong foundation for the rigor and challenge of middle school and high school algebra. An example of this representation is below.

Write an equation that will model the relationship between the number of cups of blackberries and the number of cups of juice.

During summer vacation, Lydie spent time with her grandmother picking blackberries. They decided to make blackberry jam for their family. Her grandmother said that you must cook the berries until they become juice and then combine the juice with the other ingredients to make the jam.

Cups of Blackberries	Cups of Juice
0	0
4	$1\frac{1}{3}$
8	$2\frac{2}{3}$
12	4
24	8

Solution:

$j = \frac{1}{3}b$, where j represents the number of cups of juice and b represents the number of cups of blackberries.

Spotlight on a representation frequently used in this module:

Equation

There are several models used in *A Story of Ratios* that will foster deep knowledge of important concepts in middle school mathematics.

In Module 1, there are three commonly used tools and representations that your child will frequently use: ratio tables, coordinate planes, and equations. Ratio tables are frequently used to show an organized list of related ratios. For example, in the ratio table above, your child is able to see how the number of cups of juice is one third of the number of cups of blackberries or if the number of cups of juice is multiplied by 3, the number of cups of blackberries is determined. In Grade 6, students recognized the multiplicative and additive structures that exist within ratio tables. The coordinate plane is another way to represent a relationship and an easy way to determine whether a relationship is proportional. Equations represent information in a clear and concise way so your child is able to quickly solve problems and make predictions.

Although each of these tools are different, they all have a similar goal of helping your child develop his/her thinking in a concrete way (manipulating something that physically exists) so he/she experiences a direct connection between the models and math symbols and is able to solve problems abstractly. In *A Story of Ratios*, your child will use the proportional reasoning skills that he/she develops in this module to propel your child into success in the modules yet to come!

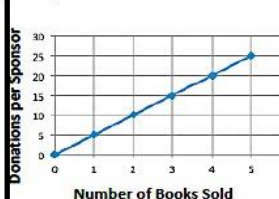
Below is a problem that shows different representations of the same proportional relationships with a description of how students can recognize it as such.

* Taken from Lesson 6*

Problem:

The school library receives money for every book sold at the school's book fair. Create a table, and then graph and explain if the quantities are proportional to each other.

Graph:



Solution:

Table:

Number of Books Sold	Donations per Sponsor (\$)
1	5
2	10
3	15
4	20
5	25

Explanation:

The quantities are proportional to each other because the points appear on a line that goes through the origin. Each book sold brings in \$5.00 no matter how many books are sold.

Even though the point (0,0) does not represent a ratio, interpreting the meaning of the point in the context of the problem helps students understand why it is included, i.e. if the school library does not sell any books, they will not raise any money.