Packet 16: Applications of Proportional Reasoning

Dear Parents/Guardians,

In Packet 16, students apply proportional reasoning concepts to real world problems. In Lesson 1, students solve problems involving saving for high-cost items. In Lesson 2, students compare prices of similar items to find the best buys. In Lesson 3, students determine the amount of paint and hours it would take for specified rooms. Each lesson allows students to set up equations to model the problems, as well as create and analyze tables and graphs to find solutions.

Developing Equations from Context

In each lesson, students can generate an equation to represent the problem. One method is to use a table to find patterns in order to set up an equation.

Ed is saving for a phone that costs $400. He has already saved $50 and plans on saving $75 each month. Write an equation to describe Ed's saving plan.

# of months (x)	computation	total saved (y)
0	50 + 75 (0) = 50	$50
1	50 + 75 (1) = 125	$125
2	50 + 75 (2) = 200	$200
3	50 + 75 (3) = 275	$275
4	50 + 75 (4) = 350	$350
5	50 + 75 (5) = 425	$425
x	50 + 75 (x) = y	$y

Notice the patterns in the computation section.

Students may start with $50, since that was what Ed had saved at the beginning.

For every month Ed works, he saves $75.

For example, if Ed works 3 months, he has saved 3 of the $75.

We can now set up an equation.

The amount saved = initial amount + amount saved per month (number of months)

$$y = 50 + 75(x)$$

Writing it in the form $y = mx + b \rightarrow y = 75x + 50$

Analyzing Tables, Graphs, and Words

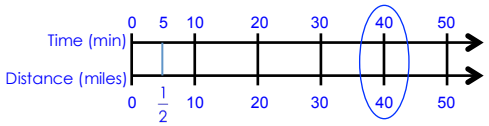
Students will represent problems using tables, graphs, and words. They will notice that the solution can be found in any of the representations.

Aaron and Ben are going to school. Aaron rides his bike at a rate of 8 miles per hour. It takes Ben 6 minutes to go half a mile on his skateboard. Who is moving faster?

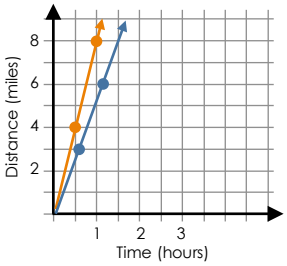
Students could represent the information in a table, like Aaron's rate.

Time (hours)	1	2	$\frac{1}{2}$	$1\frac{1}{2}$	$2\frac{1}{2}$
Distance (miles)	8	16	4	12	20

Students could represent the information on a double number line, like Ben's rate. Note Ben's time is measured in minutes rather than hours.



Using the above representations, we see that in a half hour. Aaron rides 4 miles, whereas Ben skates 3 miles. This shows that Aaron is traveling at a faster rate.



Students could represent the information on a graph. Aaron's graph is steeper than Ben's because he is covering more distance at any given time. We can say that Aaron is going at a faster rate.

By the end of the packet, your student should know…

The relationship between dependent and independent variables Lesson 16.1

How to set up equations to model real-world problems Lessons 16.1, 16.2, and 16.3

How to analyze problems using tables, graphs and words Lessons 16.1, 16.2, and 16.3

Additional Resources

Resource Guide (RG)
Part 2, pages 22-31