

KEY CONCEPT OVERVIEW

In the final topic of Module 4, students extend their work with both percents and multi-step equations. In the first two lessons of the topic, students solve population and mixture problems. (See Sample Problems.) In the final lesson of the topic, students solve counting problems, preparing them to study probability in Module 5.

You can expect to see homework that asks your child to do the following:

- Solve percent word problems in various contexts.
- Calculate the percents of a sample when provided with an organized list.

SAMPLE PROBLEMS (From Lessons 16–17)

1. In one year’s time, 20% of Ms. McElroy’s investments increased by 5%, 30% of her investments decreased by 5%, and 50% of her investments increased by 3%. By what percent did her total investments increase?

Let n represent the dollar amount of Ms. McElroy’s investments before the changes occurred during the year.

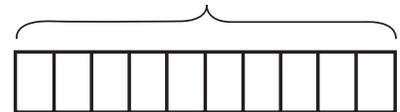
After the changes, the following represents the dollar amount of her investments:

$$0.2n(1.05) + 0.3n(0.95) + 0.5n(1.03)$$

$$0.21n + 0.285n + 0.515n$$

$$1.01n$$

Original investment (n)



Since 1.01 is equivalent to 101%, Ms. McElroy’s total investments increased by 1%.

2. Represent the situation below using an equation.

A 6-pint mixture that is 25% oil is added to a 3-pint mixture that is 40% oil. What percent of the resulting mixture is oil?

Show all of the steps in your solution.

Let x represent the percent of oil in the resulting mixture.

$$0.25(6) + 0.40(3) = x(9)$$

$$1.5 + 1.2 = x(9)$$

$$2.7 = x(9)$$

$$\frac{1}{9}(2.7) = \frac{1}{9}(x)(9)$$

$$0.3 = x$$

The resulting 9-pint mixture is 30% oil.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

HOW YOU CAN HELP AT HOME

You can help at home in many ways. Here are some tips to help you get started.

- Create a matching game to practice representing percent increase and percent decrease problems as algebraic expressions. For example, on one index card, write *increase by 20%*; on the matching index card, write $1.2x$ because an increase of 20% can be represented as 120% of the original amount, or $1.2x$. On another index card, write *20% decrease*, and then write $0.8x$ on the matching card because a 20% decrease can be represented as $100\% - 20\%$, which is 80% of the original amount. Create at least five problems and their matches. Shuffle the cards and arrange them facedown in an array. When it is your turn, flip over two cards and determine if they are a match. For example, *increase by 20%* and $1.2x$ are a match. If you have a match, keep the cards and go again. If your two cards are not a match, flip them back over. Now it is the next person's turn. When all of the matches have been made, the game is over.
- While at the store, discuss how you would calculate a sale price. For example, if an item is on sale for 35% off the original price, the sale price can be calculated by $0.65x$, where x represents the original price. (The number 0.65 is used as the coefficient because $100\% - 35\% = 65\%$ of the original amount, or $0.65x$.)
- In preparation for Module 5, present a scenario and discuss possible outcomes. For example, if a Grade 7 student has three pairs of shoes and two hats, how many different combinations of shoes and hats can be made?