

Writing Algebraic Equations

Short description: Learn how writing an algebraic equation can help solve a real-life scenario—in this case, determining in advance when to buy a supply of cat food—in this Math Shorts video.

Long description: In this video, learn how writing an algebraic equation can help solve a real-life scenario—in this case, determining in advance when to buy a supply of cat food. Learning how to translate a real-life scenario to mathematical language is an important skill. In the accompanying classroom activity, students practice developing expressions and equations from story problems. Special attention is paid to identifying the variable. Students also take turns as mathematicians, coming up with some of their own scenarios for their classmates to solve.

Activity Text

Learning Outcomes

Students will be able to

- represent a real-world relationship as a mathematical expression, equation, or inequality
- use a variable to represent an unknown quantity

Common Core State Standards: 7.EE.B.4a

Vocabulary: Variables

Materials: Writing Algebra worksheet

Procedure

1. Introduction (5 minutes, whole group)

It is important to be able to translate real-world problems into mathematical language. Begin the lesson by asking students to consider each of the following scenarios. Have students talk with the person next to them about how the scenarios could be translated into numbers and *variables*.

- Today's walk took 30 minutes longer than yesterday's walk. If x = the length of yesterday's walk, how would you represent today's walk? (Answer: $x + 30$)
- Twice as many people went to the zoo as went to the carnival. If y = the number of people who went to the carnival, how would you represent the number of people who went to the zoo? (Answer: $2y$)
- The temperature in New York City is 21 degrees cooler than the temperature in Washington, DC, today. If z = the temperature in New York, how would you represent the temperature in Washington, DC? (Answer: $z + 21$)

Review and explain each of these scenarios as a group before moving on to the video. Also explain that in these scenarios, a variable is being used to represent an unknown quantity. It's not essential to know the exact length of yesterday's walk, or the number of people who went to the carnival, or the temperature in New York in order to use these quantities to create a mathematical relationship. Tell students that later in the activity, they will be solving and developing some of these problems on their own.

2. Watch the Video (10 minutes, whole group)

Show students the video. The video shows how a real-life situation can be modeled using mathematics. Show the video again so that students can pay attention to the mathematics. Ask students to think about these ideas as they watch:

- The narrator says that one way that Jason can figure out when to buy more cat food is to start at 48 and count the number of times he can subtract 2 before he arrives at the number 6. Explain why that method *will* work (even if it takes a while).
- Explain why $2n =$ the number of cups of cat food eaten.
- In the context of this video, what does $48 - 2n = 6$ mean?

3. Activity (15 minutes, pairs)

Divide the class into pairs and have students complete the worksheet. The worksheet asks students to represent different real-life scenarios by using numbers and variables. As students are working through the problems, ask them to explain what a variable is and how they are using variables to represent the different scenarios.

4. Conclusion (5 minutes, whole group)

Ask some students to share the scenarios that they created for question 9 and to solve them as a class.