



Dear Parents and Caregivers,

We appreciate the support you give to your child's education. You are a vital partner in this learning. We would like to share some information to help you better understand Arizona's College and Career Ready Standards. The purpose of these letters is to clarify vocabulary and strategies that your child may use to make sense of numbers and develop underlying mathematical ideas. We do not expect you to teach these methods but want to help you understand the work your child will be bringing home. The topics covered in this letter are **expressions, equations, and inequalities in seventh grade**.

End-of-year goals

The goal of middle school mathematics is to extend the strong foundational knowledge developed in elementary school to new topics as students prepare for high school. In sixth grade, students began working with variables and learned that $6d$ stands for 6 times d , st stands for s times t , and b^3 stands for b times b times b . By the end of seventh grade, students will use the operations of rational numbers along with variables to build expressions, equations, and inequalities and use these to solve real-world problems.

Vocabulary

- **Variable:** A letter that represents an unknown number
- **Expression:** A mathematical phrase that contains operations, numbers, and/or variables (Expressions have NO = sign)
- **Equation:** A mathematical sentence that shows that two expressions are equivalent using an = sign
- **Inequality:** A mathematical sentence that uses $<$, $>$, \leq , \geq , or \neq to compare two unequal quantities or to represent a range of possible answers

Expressions

Students will understand how to translate real-world situations into mathematical expressions using variables.

EXAMPLE: Write an expression to represent the total cost of a rental car that charges an \$18.99 fee per day plus \$0.19 per mile driven. Use the **variables** d for the number of days a car is rented, and m for the number of miles a car is driven. ANSWER: $18.99d + 0.19m$

EXPLANATION: The daily charge for a rental car is \$18.99, so this cost can be represented by 18.99 times each day ($18.99d$). The charge for each mile driven is \$0.19, so this cost can be represented by 0.19 times each mile ($.019m$). Add these two terms together to represent the total cost of the rental car ($18.99d + .019m$).

Equations

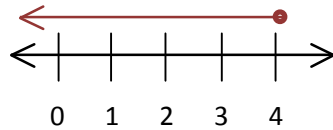
Students should solve word problems that lead to building and solving equations.

EXAMPLE: The perimeter (p) of a rectangle is 54 cm. Its length (l) is 6 cm. What is its width (w)? ANSWER: $w = 21$ cm.

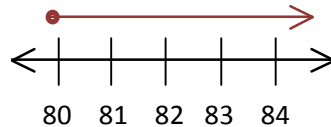
EXPLANATION: The equation for finding the perimeter of a rectangle is $2l + 2w = p$. Substitute the values we know in the place of the variables: $2(6) + 2w = 54$. Further simplifying this equation leads to $12 + 2w = 54$. Take 12 away from both sides to isolate the variable and keep both sides of the equation equal. This shows how much is left for the width. $2w = 42$. Divide both sides of the equation by 2 to isolate the variable and keep both sides of the equation equal: $w = 21$ cm.

Inequalities

Students should understand that the words “at most” mean that the most the answer can be is the amount designated. Therefore, the answer must be less than or equal to (\leq) the amount designated. The line graph below represents at most 4, as in the carnival ride can hold at most 4 people per car: $x \leq 4$.



Also, students should understand that the words “at least” mean that the least the answer can be is the amount designated. Therefore, the amount spent must be more than or equal to (\geq) the amount designated. The line graph below represents at least 80, as in the class has to raise at least \$80 to go on the field trip.



EXAMPLE 1: Florencia has **at most \$60** to spend on clothes. She wants to buy a pair of jeans for \$22 and spend the rest on shirts. Each shirt costs \$8. Write an inequality for the number of shirts she can purchase. ANSWER: $8s + 22 \leq 60$

EXPLANATION:

- Florencia can only spend an amount less than or equal to \$60, because that’s all she has. This fact gives us the inequality sign to use in this problem and the amount associated with it: \leq \$60
- The other side of the inequality comes from her purchases. We know that she will purchase one pair of jeans for \$22.
- We’re not sure how many shirts she will buy, so we represent that amount with a **variable** s . We know each shirt will cost \$8, so we can represent the total cost of however many shirts she buys with the term $8s$ indicating that no matter how many shirts she buys, that number will be multiplied by 8.
- We combine the two amounts she will spend on jeans and shirts using an addition symbol: $8s + 22$.
- Combine that with the fact that the cost of her purchases ($8s + 22$) has to be less than or equal to 60, and we come up with the answer: $8s + 22 \leq 60$

EXAMPLE 2: Kai needs to score **at least 84%** on his next history test to keep an A in the class. Write an inequality to represent his score (s). ANSWER: $s \geq 84$

EXPLANATION: Kai’s score doesn’t need to be an exact score, it just needs to be 84% or higher. So we use the greater than or equal to sign (\geq) to represent the score he needs.

How to help at home

- Ask your child to come up with expressions for things you do around your house. For example, you are going to the store to pick up one gallon of milk for \$2.49 and as many pounds of ground beef at \$4.39 as you have money for. How could this be represented as a mathematical expression (with no = sign)?
- Ask your child to come up with an equation to solve a real-world problem and then solve it. For example: Amy has \$26 to spend on school supplies. After buying 10 pens, she had \$14.30 left. How much did each pen (p) cost? (Hint: The cost for the pens can be represented by $10p$. Add that to the amount left after buying the pens and you get the total amount she had to spend, \$26. The equation would be $14.30 + 10p = 26$.)
- Help your child set up inequalities. For example: If a customer spends at least \$50, a store is offering a discount (≥ 50) to see a PG-13 movie, you must be at least 13 years old (≥ 13), a family can spend at most \$125 per week on groceries (≤ 125), or a car can carry up to 5 people (≤ 5).
- Remember, making mistakes is a part of learning.