MA.2.AR.2.1

Overarching Standard: ***MA.2.AR.2 Demonstrate an understanding of equality and addition and subtraction.***

Benchmark of Focus

MA.2.AR.2.1: Determine and explain whether equations involving addition and subtraction are true or false.

Example: The equation 27 + 13 = 26 + 14 can be determined to be true because 26 is one less than 27 and 14 is one more than 13.

Benchmark Clarifications

Clarification 1: Instruction focuses on understanding of the equal sign.
Clarification 2: Problem types are limited to an equation with three or four terms. The sum or difference can be on either side of the equal sign.
Clarification 3: Addition and subtraction are limited to sums up to 100 and related differences.

Related Benchmark/Horizontal Alignment

MA.2.AR.1.1

Vertical Alignment

Previous Benchmarks	Next Benchmarks
MA.1.AR.2.2	MA.3.AR.2.2

Terms from the K-12 Glossary

- Equal sign
- Equation

Purpose and Instructional Strategies

The purpose of this benchmark is to further develop an understanding of the equal sign by examining equations. In grade 1, students determined and explained whether equations involving addition and subtraction within 20 were true or false.

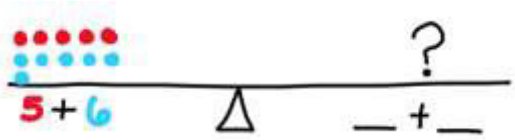
- Instruction includes the use of manipulatives or drawings to show balanced equations.
- Instruction includes equations where the minuend, subtrahend or addends are on either side of the equal sign.
- Instruction includes equations in different forms such as $a + b = c$ or $c = a + b$.
- Instruction includes examples of equations that are false.

Common Misconceptions or Errors

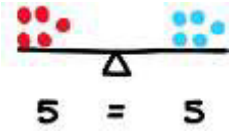
- Students may not understand the equal sign means “the same as” and only relate it to “the answer is.”
- Students may think the equal sign requires them to do something.

Strategies to Support Tiered Instruction

- Teacher provides opportunities to use a number balance to support understanding of the equal sign.
    - For example, students build the expression 5 + 6 on one side of the balance and are asked to build an expression of equal magnitude of the other side. Students may choose to use a 9 and a 2, an 8 and a 3, or a 7 and a 4. Since students cannot use an 11 and must use two separate numbers instead, they are dispelling the misconception that the equal sign means "the answer is."

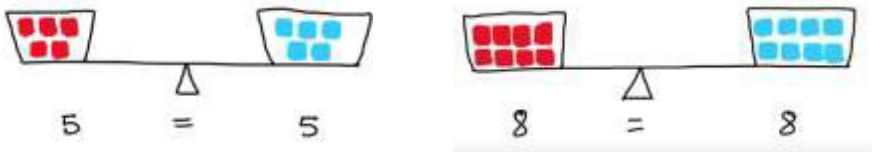


- Teacher provides examples of simple equations with no operations to determine if they are true or false using a number balance. Focus should be on the equality of an equation that only contains the equal sign. Students may draw a picture to show the quantities are equal.
    - For example, the equation 5 = 5 can be modeled using the number balance below.



- Teacher provides manipulatives to model each side of the equation to determine if an equation is true or false.
    - For example, for the equation 8 + 6 = 10 + 5 students would use two-color counters to build each side of the equation and then count to determine if they are equal.

- Teacher provides opportunities to use a balance to explore simple equations that only contain an equal sign.
    - For example, students use cubes to represent the equation on the balance using the equations 5 = 5, 8 = 8, and 3 = 3.



Questions to ask students:

- What does the equal sign in your equation mean?
    - Sample answer that indicates understanding: "The equal sign means 'is the same as'."

- Ask: How can you prove that 26 + 15 = 27 + 14 is a balanced equation?

- Sample answer that indicates understanding*: This equation is balanced or the same on both sides. I know this because 26 + 15 equals 41 and 27 + 14 equals 41. They both equal the same so the equation is balanced.*

- *Ask: Which of these equations are true? Explain your thinking. 14 + 38 =49 or 59 = 35 + 24*
  - Sample answer that indicates understanding: 59 = 35 + 24 is true because I can draw a model and show that 35 + 24 equal 59 or I can start at 35 and count up 24 which makes 59. 14 + 38 is false because 38 and 14 more equals 52.

Instructional Tasks

Instructional Task 1 (MTR.6.1)

Provide students the table below. Ask students to determine and explain how they know that each equation is true or false.

Equation	True/False	Explanation
21 + 38 = 35 + 24		
87 − 35 = 80 − 29		
37 + 39 = 32 + 44		
30 + 43 = 26 + 47		

Instructional Items

Instructional Item 1

Which of the following explains why 15 + 18 = 25 + 8 is a true equation?

a. The equation 15 + 18 = 25 + 8 is true because 15 is ten less than 25 and 18 is ten more than 8.
b. The equation 15 + 18 = 25 + 8 is true because both equations are adding 8 ones.
c. The equation 15 + 18 = 25 + 8 is true because both equations have a number that has a 5 in the ones place.

Additional Resources:

CPALMS Resources

Video: Khan Academy – Equal Sign

Resources/Tasks to Support Your Child at Home:

Addition Scale – http://www.toytheater.com/addition-scale.php– This interactive game has students completing equations to make the statement true.

Task: Choose a target number less than 20. Use playing cards to find as many possible combinations of cards to reach the target number.

Task: Write a variety of true and false addition and subtraction equations. Work together to sort them into the correct true or false pile.

Is the equation true or false? – http://i4c.xyz/qx3c38l – In this interactive ten-question quiz, players must decide if the given equation is true or false. Extend the game by rewriting the false equations to make them true.