MA.2.AR.2.2

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

Benchmark of Focus

MA.2.AR.2.2: Determine the unknown whole number in an addition or subtraction equation, relating three or four whole numbers, with the unknown in any position.

Example: Determine the unknown in the equation 45 + ___= 23 + 46.

Benchmark Clarifications

Clarification 1: Instruction extends the development of algebraic thinking skills where the symbolic representation of the unknown uses any symbol other than a letter.

Clarification 2: Problems include having the unknown on either side of the equal sign.

Clarification 3: Addition and subtraction are limited to sums up to 100 and related differences. Refer to Situations Involving Operations with Numbers (Appendix A).

Related Benchmark/Horizontal Alignment

MA.2.AR.1.1

Vertical Alignment

Previous Benchmarks	Next Benchmarks
MA.1.AR.2.3	MA.3.AR.2.3

Terms from the K-12 Glossary

- Equation
- Equal Sign
- Expression

Purpose and Instructional Strategies

The purpose of this benchmark is to build relational thinking. In grade 1, students determined an unknown whole number in an addition or subtraction problem within 20.

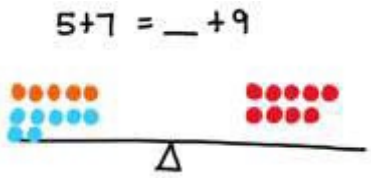
- Instruction includes an unknown value in any position.
- Instruction includes compensation of values to balance equations.
- Instruction includes the use of number lines, drawings, or models to solve addition and subtraction problems.

Common Misconceptions or Errors

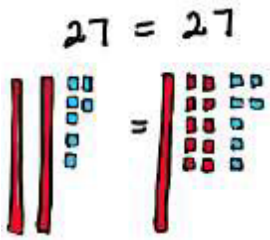
- Students may confuse the value on one side of the equation with an unknown number.
- Students may think equivalent values have to look identical.
- Students may incorrectly use compensation to add or subtract.

Strategies to Support Tiered Instruction

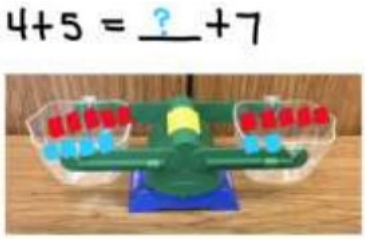
- Teacher provides opportunities to draw quantities in an equation and use drawings to determine the unknown. Teacher provides an organizer to help students represent the quantities.
    - For example, 5 + 7 = + 9.



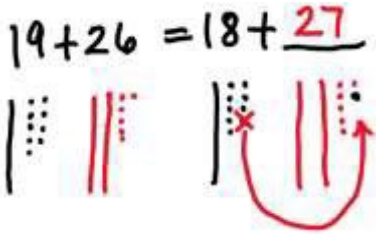
- Teacher provides opportunities to create a drawing to represent an equation by decomposing numbers on each side. The focus should be on the quantities being equal even though they look different.
    - For example, 20 + 7 = 10 + 17.



- Teacher provides opportunities to use a number balance to support understanding of finding an unknown quantity in a balanced equation.
    - For example, students build the equation 4 + 5 = + 7 on a number balance. Students then determine the value of the unknown quantity by balancing the number balance. This builds understanding that the two sides of the equation must be equal. If students try to use 9 as the unknown quantity, it will not balance.



- Teacher provides number strings to teach compensation strategies based on number relationships. The teacher may reveal one line at a time and give students time to think about their responses. As students move through the string, the teacher asks questions to help draw attention to the target strategy of compensation. Students illustrate their thinking using manipulatives such as base 10 blocks or illustrations.
    - Example:



Questions to ask students:

- Ask: Write an equation to match this problem: I have 19 blocks on the table. Some of the blocks fell onto the floor. Now I have 14 toy cars on the table. How many blocks fell onto the floor? Explain your thinking.
    - Sample answer that indicates understanding:*19 – __ = 14 ; This equation matches because I started with 19. I did not know how many blocks fell off the table so I drew a blank. I have 14 left on the table so I placed a 4 on the other side of the equal sign.*

Instructional Tasks

Instructional Task 1 (MTR.5.1)

A student solved for the missing addend in 30 + 43 = 26 + __. The student says the missing addend is 47 because 26 is 4 less than 30, so we can add 4 more to 43 and that is 47. Using this strategy determine the missing addend in the equation below and justify your thinking.

16 + 37 =_____+ 38

Instructional Task 2

Provide students the opportunity to use other strategies to determine the unknown in the equation 16 + 37 =_____+ 38. Allow students to discuss which method they prefer.

Instructional Items

Instructional Item 1

Write a number in the blank that makes the equation true.

54 –___= 32 – 15

Additional Resources:

CPALMS Resources

Khan Academy – Practice: Addition and Subtraction

Resources/Tasks to Support Your Child at Home:

Learning Farm practice – Add Three to Four Numbers

Math Playground – Subtraction: Have your child apply multiple strategies and write equations to solve word problems in game format.

Math Playground – Addition: Have your child apply multiple strategies and write equations to solve word problems in game format.

Task: Use playing cards (Ace – 9) and +, -, and = cards created from paper. Player one creates a true equation using the cards and symbols. Player two reorganizes cards to find the remaining 3 related facts.

Task: Pose various addition problems with unknown addends and encourage your child to use the inverse operation of subtraction to solve for the missing amount.