MA.1.AR.2.3

Overarching Standard: MA.1.AR.2 *Develop an understanding of the relationship between addition and subtraction.*

Benchmark of Focus

MA.1.AR.2.3: Determine the unknown whole number in an addition or subtraction equation, relating three whole numbers, with the unknown in any position.

Example: 9 + ? = 12

Example: 17 = ☐ + 5

Example: ? − 4 = 8

Benchmark Clarifications

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

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

Clarification 3: Addition and subtraction are limited to sums within 20 and related subtraction facts. Refer to Situations Involving Operations with Numbers (Appendix A).

Related Benchmark/Horizontal Alignment

· MA.1.AR.1.2

Vertical Alignment

Previous Benchmarks	Next Benchmarks
• MA.K.AR.2.1	• MA.2.AR.2.2

Terms from the K-12 Glossary

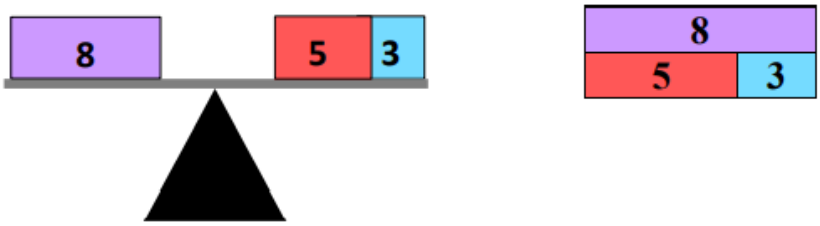
- Expression
- Equation
- Equal Sign

Purpose and Instructional Strategies

The purpose of this benchmark is for students to deepen their understanding of the equal sign and build relational thinking when looking at equations. In Kindergarten, students used objects or drawings to explain why addition or subtraction equations are true or false. (MTR.5.1) Instruction should include a variety of problem types where the sum or difference can be on either side of the equal sign.

- Instruction includes helping students to begin to develop the algebraic skill of determining a number that makes an equation true.

- Within this benchmark, students are expected to understand the meaning of the equal sign and how equations are used to model mathematical situations and problems.
- Instruction includes an unknown value in any position. (MTR.2.1)
- Instruction includes presenting equations in different forms such as $a + b = c$ or $c = a + b$. (MTR.2.1)
- Instruction may include the use of a balance scale representation or bar model to help students understand how to write equations. (MTR.2.1, MTR.5.1)
    - For example, a balance model and a "bar model" for 8 = 5 + 3 are shown below.

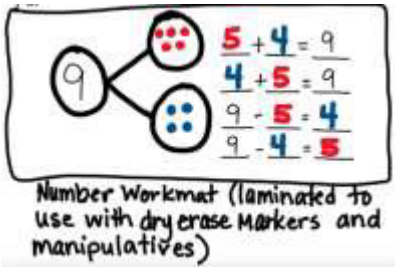


Common Misconceptions or Errors

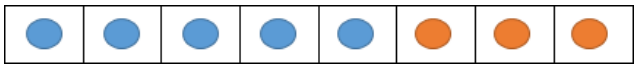
- Students may not understand that they can use addition to figure out a subtraction equation or use a subtraction to figure out an addition equation. In these cases, ask students to find the related facts for a given problem.

Strategies to Support Tiered Instruction

- Teacher provides opportunities to use number bonds to develop an understanding of fact families and inverse relationships.
    - For example, students create a number bond for the number 9. Students then write the fact families for the number 9. Discussion should be focused on how the fact families are related and how knowing the addition facts can help the students solve a subtraction problem.



- Teacher models solving problems that highlight the relationship between addition and subtraction using a linear ten frame. Then, students use two different colors to shade the addend on the ten frame.
    - Example:



Students write the addition fact that is represented on the ten frame 5 + 3 = 8. Students then subtract 3 from 8 by folding under the three "orange" blocks.

Students are left with the 5 "blue" blocks, so 8 – 3 = 5.
Students should practice with multiple addition facts. Discussion should be focused on the relationship between addition and subtraction.

Questions to ask students:

What addition equation could help you determine the unknown in the equation 11 = ☐ - 4 ?

- Sample answer that indicates understanding: 11 + 4 = ☐

How could you balance the equation 12 = 8 + ☐ ?

- Sample answer that indicates understanding: *The equal sign tells me that what is on one side of the equation should be the same value as on the other side. 12 is the same as 8 and 4 more.*

Instructional Tasks

Instructional Task 1

Annette says the missing number for 18 – ☐ = 14 is 8. Jessica says the missing number is 4. Who is correct? Use numbers, pictures and/or words to show your thinking.

Instructional Task 2

Emilio needs to find the missing number in the following number sentence: ☐ – 7 = 9. Draw a picture to show Emilio how he could find the missing number. Then describe how you found the missing number.

Instructional Task 3

What missing number would balance the equation 10 = 7 + ☐ ?

Instructional Items

Instructional Item 1

Which of the following equations are true with an unknown value equal to 8?

a. $19 - \square = 9$
b. $18 - \square = 10$
c. $\square = 20 - 8$
d. $\square = 2 + 6$
e. $4 + 5 = \square$

Instructional Item 2

What is the missing addend in the equation $15 = \square + 6$?

a. 15
b. 10
c. 9
d. 5

Instructional Item 3

What addition equation could help to determine the unknown in the equation $13 = \square - 4$?

a. $11 + 2 = 13$
b. $10 + 4 = 14$
c. $13 + 4 = 17$
d. $4 + 8 = 12$

Additional Resources:

CPALMS Resources

Khan Academy Video: Relating Addition and Subtraction

Resources/Tasks to Support Your Child at Home:
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.

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