MA.1.AR.1.2

Overarching Standard: MA.1.AR.1 *Solve addition problems with sums between 0 and 20 and subtraction problems using related facts.*

Benchmark of Focus

MA.1.AR.1.2: Solve addition and subtraction real-world problems using objects, drawings, or equations to represent the problem.

<u>Benchmark Clarifications</u>

Clarification 1: Instruction includes understanding the context of the problem, as well as the quantities within the problem.

Clarification 2: Students are not expected to independently read word problems.

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.NSO.2.1/2.2/2.3
- MA.1.AR.2.1/2.2/2.3
- MA.1. M.1.1
- MA.1. M.2.3
- MA.1. DP.1.2

Vertical Alignment

Previous Benchmarks	Next Benchmarks
MA.K.AR.1.3	MA.2.AR.1.1

Purpose and Instructional Strategies

The purpose of this benchmark is for students to start to apply their understanding of mathematical concepts as they critically apply their knowledge in visualizing and deciphering word problems. In Kindergarten, students solved real-world addition and subtraction problems within 10, with a focus on drawings and equations to represent problems. Students are not expected to independently read word problems. (MTR.7.1)

- Instruction allows students to focus on context and apply reasoning to determine the appropriate operation. (MTR.7.1)

- Instruction includes helping students realize that there can be more than one representation for a given problem which could be helpful for students to choose which representation they prefer and to communicate with other students who might prefer a different representation. (MTR.2.1, MTR.4.1, MTR.5.1)

- Instruction includes getting students to assess the reasonableness of their solutions within context. (MTR.6.1)
- Instruction may begin with concrete models, pictures, numbers, and words, and then move into writing equations. (MTR.2.1)
- Instruction should include a variety of problem types (see Appendix A) and not a focus on any single problem type. It is important that students have opportunities to solve various problem types.

Common Misconceptions or Errors
- Students may have difficulty modeling or solving problems that involve a change unknown or start unknown problem type. To help with this misconception, include the use of Appendix A in instruction.
- Students may look for key words rather than context and reasoning, which can lead to the wrong operation.

Questions to ask students:
- **How do the parts in the equation connect to the model?**
  - Sample answer that indicates understanding: *Student is able to explain how their equation connects to each part of the model and how they determined where to put the unknown in the equation.*

- **How did you decide which operation to use to solve the problem?**
  - Sample answer that indicates understanding: *Student can connect the action or sentence within the story problem to the operation used within the equation. They can justify using an explanation of the actions of the problem, not just identifying a "key word."*

Instructional Tasks
Instructional Task 1 (MTR.4.1)
There are chickens, sheep, and pigs in a barn. There are 17 animals total in the barn.
- Part A. How many chickens, sheep and pigs could be in the barn?
- Part B. With a partner, compare your work. How are your barns alike? How are your barns different?

Instructional Task 2 (MTR.1.1, MTR.2.1, MTR.7.1)
Provide students with the equation 12 = 5 + 7. Provide time for students to draw a picture that represents the equation then verbally express a word problem to match.

Instructional Items

Instructional Item 1

Trevor had 16 toy cars. He went to the toy store with his father. His father bought him some more toy cars. When Trevor got home, he counted his cars and now he has 20 cars. How many toy cars did his father buy for him? Write an equation to show how you solved the problem.

Instructional Item 2
Elliana had 19 stuffed animals. She gave some away. Now Elliana has 11 stuffed animals. How many stuffed animals did Elliana give away? Draw a picture to show your work.

Additional Resources:

CPALMS Resources

Resources/Tasks to Support Your Child at Home:

Give your child problems from the real world where they would need to combine amounts (add) or separate amounts (subtract). Have your child represent the action in the problems using everyday objects as math tools (such as beans, cotton balls, cereal, pennies, buttons, etc.).

Video: Addition Word Problems

Video: Subtraction Word Problems

Appendix A:

Situations Involving Addition and Subtraction
These situations represent the fundamental meanings and uses of addition and subtraction. The four unshaded situation types are expectations for kindergarten students. Grade 1 and 2 students should work with all situation types. Darker shading indicates the four most difficult types that students should work with in Grade 1 but not need master until Grade 2.

	Result Unknown	Change Unknown	Start Unknown
Add To	Three birds sat on a wire. Two more birds landed next to them. How many birds are on the wire now? $3 + 2 = ?$	Three birds sat on a wire. Some more birds landed next to them. Then there were five birds on the wire. How many birds landed on the wire next to the first three? $3 + ? = 5$	Some birds were sitting on a wire. Two more birds landed there. Then there were five birds. How many birds were on the wire to start? $? + 2 = 5$
Take From	Five snacks were on the table. Three snacks were eaten. How many snacks are on the table now? $5 - 3 = ?$	Five snacks were on the table. Some snacks were eaten. Then there were two snacks on the table. How many snacks were eaten? $5 - ? = 2$	Some snacks were on the table. Then three snacks were eaten. Now there are two snacks left on the table. How many snacks were on the table at the start? $? - 3 = 2$
Put Together	Three purple pens and two red pens were in the box. How many pens are in the box? $3 + 2 = ?$	Five pens are in the box. Three of them are purple, the rest are red. How many pens are red? $3 + ? = 5$ $5 - 3 = ?$	Jennifer has five pens. How many of them could be purple and how many of them could be red? $5 = 0 + 5$ $5 = 5 + 0$ $5 = 1 + 4$ $5 = 4 + 1$ $5 = 2 + 3$ $5 = 3 + 2$

	Difference Unknown	Bigger Unknown	Smaller Unknown
Compare	More: Jim has two pens. Keisha has five pens. How many more pens does Keisha have than Jim? Fewer: Jim has two pens. Keisha has five pens. How many fewer pens does Jim have than Keisha? $2 + ? = 5$ $5 - 2 = ?$	More: Keisha has three more pens than Jim. Jim has two pens. How many pens does Keisha have? Fewer: Jim has three fewer pens than Keisha. Jim has two pens. How many pens does Keisha have? $2 + 3 = ?$ $3 + 2 = ?$	More: Keisha has three more pens than Jim. Keisha has five pens. How many pens does Jim have? Fewer: Jim has three fewer pens than Keisha. Keisha has five pens. How many pens does Jim have? $5 - 3 = ?$ $? + 3 = 5$

Adapted from Box 2-4 of *Mathematics Learning in Early Childhood*, National Research Council (2009, pp. 32-33).