

Chapter 5: Addition and Subtraction Relationships

Content Area: **Mathematics**
Course(s): **Math 1**
Time Period: **January**
Length: **13 Days**
Status: **Published**

Unit Summary

In unit 5, children extend their understanding of addition and subtraction to relate these two operations (1.OA.C.6). Children identify related addition and subtraction facts and use these facts to find unknown numbers (1.OA.D.8). Children use addition to check their subtraction by recognizing the inverse relationship between addition and subtraction. This skill can make memorizing basic facts easier. They then solve word problems by choosing addition or subtraction. Children use number sentences that are not related to find ways to make numbers to 20. This leads into the understanding that the equal sign means that the quantities on both sides are equivalent in value (1.OA.D.7). At the end of the chapter, children practice facts to 20 using a variety of strategies. After Grade 1, children will continue to work towards fluency with addition and subtraction within 20 using mental strategies (2.OA.B.2). Children will then apply fluency to add and subtract within 100 using the relationship between addition and subtraction (2.NBT.5). Throughout this unit, students will master the following academic terms: addition, subtraction, equivalent, related facts, and difference.

Standards

MA.1.OA.A.1	Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
MA.1.OA.C.6	Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).
MA.1.OA.D.7	Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false.
MA.1.OA.D.8	Determine the unknown whole number in an addition or subtraction equation relating to three whole numbers.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.4	Model with mathematics.
MA.K-12.6	Attend to precision.
CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP2.1	Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
TECH.8.1.2.A.CS1	Understand and use technology systems.
TECH.8.1.2.A.CS2	Select and use applications effectively and productively. Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem

or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

Student Learning Objectives

Students will learn to...

- Solve addition and subtraction problem situations using the strategy make a model
- Identify and record related facts within 20 and use them to subtract
- Apply the inverse relationship of addition and subtraction
- Represent equivalent forms of numbers using sums and differences within 20
- Determine if an equation is true or false
- Add and subtract facts within 20 and demonstrate fluency for addition and subtraction within 20

Essential Questions

- How can we show our understanding of the equal sign?
- How can we determine if a given equation is equivalent?
- How can you decide if a number sentence is true or false?

Enduring Understandings

Students will understand that...

- There are many ways to represent a quantity.
- Using the strategy of addition, subtraction, or comparison, you can determine if two quantities are equivalent.

Application

Students will be able to independently use their learning to...

- use strategies of addition, subtraction or comparing to determine if two quantities are equivalent.

Skills

Students will be skilled at...

- Solve addition and subtraction problem situations using the strategy "make a model"
- Record related facts within 20
- Identify related addition and subtraction facts within 20
- Apply the inverse relationship of addition and subtraction
- Use related facts to determine unknown numbers
- Use a related fact to subtract
- Choose an operation and strategy to solve an addition or subtraction word problem
- Represent equivalent forms of numbers using sums and differences within 20
- Determine if an equation is true or false
- Add and subtract facts within 20 and demonstrate fluency for addition and subtraction within 10