

# Unit 1: Operations and Algebraic Thinking

Content Area: **Mathematics**  
Course(s): **Mathematics - Grade 1**  
Time Period: **1st Marking Period**  
Length: **12 weeks**  
Status: **Published**

## Unit Overview

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Represent, solve problems, and apply properties of operations and the relationship between addition and subtraction in order to add and subtract equations within 20.

Prior to beginning chapter 1, complete a number sense review for two weeks.

Benchmark 1 covers Chapter 1 and Chapter 2.

Benchmark 2 covers Chapter 3 and Chapter 4.

Both benchmarks can be given at the end of the unit.

## Transfer

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

represent, solve problems, and apply properties of operations and the relationship between addition and subtraction in order to add and subtract equations within 20.

## Meaning

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## Understandings

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Students will understand that...

- Move two groups of objects together to make a whole.
- The plus (+) sign connects two parts.
- An equal (=) sign shows parts connected into a whole.
- Find sums up to 10 by adding zero.

- Use different ways to make 10.
- Identify whether a math statement is true or false.
- Take away a part from the whole.
- The answer is called the "difference".
- Use related addition facts to help find related subtraction facts.
- The minus sign represents take away.
- Use one-to-one correspondence, the remaining objects are the difference.
- Add three numbers using properties of operations to find the sum.
- Count on to add by starting with the greater number.
- Start with the greater number and count on moving to the right on a number line.
- Two addends that are the same number are called doubles.
- Doubles plus one more is the next number.
- Doubles minus one is the previous number.
- Use the count back strategy to find the difference in subtraction problems.
- Take apart the number being subtracted so that the first step results in ten.
- Use related facts to help you find the missing addend.
- Use the relationship between addition and subtraction to find fact families.

## **Essential Questions**

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Students will keep considering...

Chapter 1: How do you add numbers?

Chapter 2: How do you subtract numbers?

Chapter 3: How do I use strategies to add numbers?

Chapter 4: How do I use strategies to subtract numbers?

## **Application of Knowledge and Skill**

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### **Students will know...**

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- How to join parts to make a whole
- How to join groups using symbols
- Use the Zero Property of Addition to find a sum
- How to make a sum of 10 with numbers 0 through 10
- How to understand the meaning of the equals sign to identify if a math statement is true or false
- How to take away a part from the whole
- How to use addition facts to find subtraction facts

- How to use symbols to show take away situations
- How to compare groups using subtraction
- How to apply properties of operations to add
- How to count on to add another number
- How to use a number line to add
- How to use doubles to add
- How to add near doubles to find the sum
- How to count back to subtract
- How to take apart a number to subtract to make 10
- How to find a missing addend using addition and subtraction
- How to use the same four numbers to add and subtract

### **Students will be skilled at...**

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- Join parts to make a whole
- Use the plus sign and equal sign to join two groups
- Use zero to add with numbers to find a sum of 10 or fewer
- Make a sum of 10 in different ways using numbers 0 through 10
- Tell whether each math statement is true or false
- Take away one part from the whole to find the difference
- Find related subtraction facts from an addition fact
- Write a subtraction number sentence
- Add three numbers to find the sum
- Use the greater number and count on by the smaller number to find the sum
- Start with the greater number and move to the right to add the smaller number
- Add together two of the same addends to find the sum
- Add together near doubles facts to find the sum
- Start with the greater number and count back by the smaller number to find the difference
- Take apart the number being subtracted in two numbers that will result in a 10
- Solve a subtraction number sentence by using its related addition fact
- Use the same three numbers to create a fact family for the numbers 3, 8, and 11

See picture examples in My Math Teacher Manual: What's the Math in this Chapter? Section (Chapters 1-4)

### **Academic Vocabulary**

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Stronger emphasis on the understanding of vocabulary to be able to retain and recall the meaning

of the words.

- Add
- Part
- Whole
- Addition number sentence
- Equal (=)
- Plus (+)
- Sum
- Zero
- In all
- Same
- False
- True
- Subtract
- Difference
- Minus (-)
- Subtraction number sentence
- Compare
- Related Facts
- Count on
- Number line
- Addends
- Doubles
- Doubles plus 1
- Doubles minus 1
- Count back
- Fact Family
- Missing addend

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### **Learning Goal 1**

- Solve word problems involving addition and subtraction within 20, using objects, drawings, and equations to represent the problem.
- Solve word problems involving three whole numbers (some less than or equal to 20) using objects, drawings, and equations.

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### **Daily Targets**

SWBAT

- Act it out to solve problems. (Ch. 3 Lesson 6; Comprehension; DOK 3.)

- Add three numbers by looking for doubles or making a 10. (Ch. 3 Lesson 9; Analysis; DOK 3.)
- Add two parts to make a whole. (Ch. 1 Lesson 2; Retrieval (Executing); DOK 2.)
- Compare groups of up to nine objects. (Ch. 2 Lesson 7; Analysis; DOK 3.)
- Count on from the greater number to find the sum. (Ch. 3 Lesson 1; Retrieval; Executing; DOK 2.)
- Draw a diagram to solve problems. (Ch 2 Lesson 6; Comprehension; Symbolizing; DOK 2.)
- Identify similarities in fact families. (Ch 2. Lesson 13; Ch 4 Lesson 7; Analysis; Matching; DOK 3.)
- Make ten to subtract. (Ch 4 Lesson 5; Comprehension; DOK 2.)
- Subtract numbers. (Ch. 2 Lessons 8, 9, 10, 11, & 12; Retrieval; DOK 1.)
- Subtract parts from a whole. (Ch 2 Lesson 2; Retrieval; Executing; DOK 2.)
- Use a number line and count back one, two, or three to subtract. (Ch. 4 Lesson 1 & 2; Retrieval; DOK 2.)
- Use a number line, doubles, and near doubles strategies to help find the sum. (Ch. 3 Lessons 3, 4, & 5; Comprehension; DOK 2)
- Use a number, doubles, and near doubles strategies to help find the difference. (Ch 4 Lesson 3; Comprehension; DOK 2.)
- Use a ten frame and counters to make sums greater than 10. (Ch 1 Lesson 11 & Ch 3. Lesson 7; Comprehension; DOK 2.)
- Use counters and a ten frame to make sums in different ways. (Ch. 1 Lesson 7, 8, 9, & 10; Retrieval; Executing; DOK 2.)
- Use manipulatives to model addition stories. (Ch. 1 Lesson 1; Comprehension (symbolizing); DOK 2)
- Use models to represent and solve subtraction situations. (Ch 2 Lesson 1; Comprehension; Symbolizing; DOK 2)
- Use pennies to count on. (Ch. 3 Lesson 2; Retrieval; Executing; DOK 2.)
- Write addition facts horizontally and vertically to find the sum. (Ch. 1, Lesson 5; Retrieval; Executing; DOK 2.)
- Write addition number sentences to solve problems. (Ch. 1 Lesson 3 & 6; Comprehension DOK 2.
- Write subtraction facts horizontally and vertically to find the difference. (Ch. 2 Lesson 5; Retrieval; Executing; DOK 2.)
- Write subtraction number sentences to solve problems. (Ch. 2 Lesson 3; Ch. 4 Lesson 4; Comprehension DOK 2)

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.1.OA.A	Represent and solve problems involving addition and subtraction.
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.K-12.2	Reason abstractly and quantitatively.
MA.1.OA.A.2	Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.1.OA.C	Add and subtract within 20.

MA.K-12.6	Attend to precision.
MA.1.OA.C.5	Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).
MA.K-12.7	Look for and make use of structure.
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.K-12.8	Look for and express regularity in repeated reasoning.

## Learning Goal 2

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- Applies properties of operations as strategies to add and subtract (for example Commutative, Associative)
- Solve subtraction problems as unknown addend problems (for example, subtracting 10-8 by finding the number that makes 10 when added to 8)

## Daily Targets

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### SWBAT:

- Find sums by adding zero. (Ch 1 Lesson 4; Retrieval; DOK 1.)
- Identify similarities in related addition and subtraction sentences. (Ch 3 Lesson 8, Ch 4 Lesson 6; Analysis; Matching; DOK 2.)
- Subtract to find missing addends. (Ch 4 Lesson 8; Comprehension; DOK 2.)
- Subtract zero or find a difference of zero. (Ch 2 Lesson 4; Retrieval; DOK 1.)

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.1.OA.B	Understand and apply properties of operations and the relationship between addition and subtraction.
MA.1.OA.B.3	Apply properties of operations as strategies to add and subtract.
MA.K-12.4	Model with mathematics.
MA.1.OA.B.4	Understand subtraction as an unknown-addend problem.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.K-12.8	Look for and express regularity in repeated reasoning.

## Learning Goal 3

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- Determine the unknown whole number in an addition or subtraction equation relating three whole numbers

## Daily Targets

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### SWBAT:

- Identify and determine whether math statements are true or false. (Ch. 1 Lesson 13; Chapter 2 Lesson 14; Analysis; Analyzing Errors; DOK 2.)
- Identify missing parts of ten. (Ch 1 Lesson 12; Analysis; Analyzing Errors; DOK 2.)

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.1.OA.D	Work with addition and subtraction equations.
MA.K-12.8	Look for and express regularity in repeated reasoning.
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.

## Formative Assessment and Performance Opportunities

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Chapter 1 Performance Task: **Lemonade Stand** DOK1, DOK 2; DOK 3- SW write number sentences, add numbers, and find missing parts to help Marta and her lemonade stand (Rubric in TM pg. 98PT 1 & 2)

Chapter 2 Performance Task: **At The Zoo** DOK1, DOK2, DOK3 - SW solve subtraction word problems, write subtraction equations, and identify related subtraction facts (Rubric in TM pg. 202PT1 & 2)

Chapter 3 Performance Task: **The Soccer Game** DOK1, DOK2 - SW use number lines and "making ten" to add two or three numbers together (Rubric in TM pg. 272PT1 & 2)

Chapter 4 Performance Task: **On a Hike** DOK1, DOK2, DOK3 - SW use number lines and "making ten" to add numbers together (Rubric in TM pg. 336PT1 & 2)

- Chapter quizzes
- Check My Progress
- Common Core Quick Check

- Concept Check
- Fluency
- Graded Classwork
- Homework
- Link It
- Teacher Observation

## Summative Assessment

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### Chapter Tests

### Benchmark Assessment

## 21st Century Life and Careers and Technology

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CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
CRP.K-12.CRP1.1	Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.
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.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP4.1	Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP8.1	Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they



	follow through to ensure the problem is solved, whether through their own actions or the actions of others.
CAEP.9.2.4.A.1	Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.
CAEP.9.2.4.A.4	Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.
TECH.8.1.2.D	Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
TECH.8.1.2.D.CS1	Advocate and practice safe, legal, and responsible use of information and technology.
TECH.8.1.2.E	Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.
TECH.8.1.2.E.CS3	Evaluate and select information sources and digital tools based on the appropriateness for specific tasks.

## **Accommodations and Modifications**

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See Common Error! notice in My Math Teacher Manual (Practice and Apply) for tips on differentiation for Chapters 1-4.

### Computer Resources

[StMath](#)

[Math Playground](#)

[Spalsh Math](#)

[Math Game Time](#)

- Allow higher learners to design their own ways to find the answers to complex questions
- Centers
- Coherence Map: [achievethecore.org/coherence-map](http://achievethecore.org/coherence-map)
- Computer Resources: see above for hyperlinks
- Have curriculum materials translated into native language
- If students have difficulty accessing the facts, provide a variety of practice opportunities, such as board games, flashcards, and boardgames.
- If students have difficulty solving addition and subtraction story problems, provide opportunities for use of various math manipulatives; part-part-whole mat, connecting cubes, counters.
- If students miscount, encourage them to count aloud as they touch manipulatives.
- Modifications as per IEP/504
- Provide visual and auditory aides(songs, chants, poems) to use as cuing resources.
- RTI guide in My Math chapter specific
- Small group instruction
- Use alternate text at lower readability level for story problems.
- Use thematic instructional opportunities to connect learning across the curriculum for higher learners
- Work with fewer items per page or line, and/or materials in a larger print size.

## Unit Resources

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- AAMath <http://www.aaamath.com/>
- ABCYA: <http://www.abcya.com>
- Brainpop <http://www.brainpop.com/>
- Coherence Map: [achievethecore.org/coherence-map](http://achievethecore.org/coherence-map)
- Cool math 4 kids <http://www.coolmath4kids.com/>
- Funbrain <http://www.funbrain.com/>
- <https://www.illustrativemathematics.org>
- Math Fact Café <http://www.mathfactcafe.com/>
- Math playground <http://www.mathplayground.com/>
- My Math Chapters 1-4
- My Math: Foldables
- My Math: Learning Stations
- My Math: Model the Math
- My Math: Trade Books to improve interdisciplinary connections.
- My Math: Vocabulary Cards
- ST MATH (Push Box Addition, 10 Frame Addition, Basic Fact Subtraction, Bird Expression)

## Interdisciplinary Connections

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*Double the Number (Teacher Guide page 3)* presents opportunities for students to add doubles while they learn about body parts of animals. (1.OA.5)

*Finding the Way (Teacher Guide page 4)* presents map skills and addition strategies as students follow a path from home to the library. (1.OA.2)

SOC.6.1.4.B.1

Compare and contrast information that can be found on different types of maps and determine how the information may be useful.

1-LS3-1.LS3.B.1

Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways.