

# 04. Addition & Subtraction and Mathematical Models

Content Area: **Math**  
Course(s):  
Time Period: **Full Year**  
Length: **5 weeks**  
Status: **Published**

## **General Overview, Course Description or Course Philosophy**

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In this unit, students will focus on the following skills and concepts:

- fact power
- money
- open number lines
- number stories and number models

## **OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS**

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### **Enduring Understandings:**

- Number sense develops through experience.
- Place value relationships can help simplify mathematical operations and equations.
- Understanding place value can lead to number sense and efficient strategies for computing with numbers.
- Patterns on a hundred chart can be used to add numbers and to develop mental math strategies and number sense.
- Patterns in a hundred chart can be used to subtract numbers and to develop mental math strategies and number sense.
- All sums and differences can be found using models.
- Sums can be represented as lengths on a number line diagram of addition.
- Models can help organize the information presented in number stories.
- Symbols can be used to represent the unknown information in a number story and/or equation.
- There is a connection between the strategy used and a written method or equation.
- A problem solver understands what has been done, knows why the process was appropriate, and can support it with reasons and evidence.
- There can be different strategies to solve a problem, but some are more effective and efficient than others are.

### **Essential Questions:**

- How do I use place value to enhance my addition and subtraction skills and build my number sense?
- How can you use patterns on a hundreds chart to add or subtract two digit numbers?
- In what ways can items be grouped to make exchanges for unit(s) of higher value?
- How can sums be found mentally?
- How can differences be found mentally?
- What is a standard procedure for adding two digit numbers?

- How can models help organize the information in number stories?
- Does my strategy match my written method or equation?
- How does explaining my process help me to understand a problem's solution better?
- How do I decide what strategy will work best in a given problem situation?
- What do I do when I get stuck?
- How do I know when a result is reasonable?

## **CONTENT AREA STANDARDS**

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### **2.OA**

**A. Represent and solve problems involving addition and subtraction**

**B. Add and subtract within 20**

**C. Work with equal groups of objects to gain foundations for multiplication**

### **2.NBT**

**A. Understand place value**

**B. Use place value understanding and properties of operations to add and subtract**

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|--------------|--|
| MA.2.OA.A.1  | Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.   |
| MA.2.NBT.B.5 | Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.  |
| MA.2.NBT.B.6 | Add up to four two-digit numbers using strategies based on place value and properties of operations.   |
| MA.2.NBT.B.7 | Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds. |
| MA.2.NBT.B.8 | Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.   |
| MA.2.NBT.B.9 | Explain why addition and subtraction strategies work, using place value and the properties of operations.  |
| MA.K-12.1    | Make sense of problems and persevere in solving them.  |
| MA.K-12.2    | Reason abstractly and quantitatively.  |
| MA.K-12.4    | Model with mathematics.  |
| MA.K-12.6    | Attend to precision.   |

## **RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)**

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| LA.W.2.5        | With guidance and support from adults and peers, focus on a topic and strengthen writing as needed through self-reflection, revising and editing.   |
| LA.SL.2.1       | Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.   |
| PFL.9.1.2. FI.1 | Differentiate the various forms of money and how they are used (e.g., coins, bills, checks, debit and credit cards).  |
| TECH.9.4.2.CI.1 | Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).<br><br>Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem. |

## **STUDENT LEARNING TARGETS**

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- I can illustrate addition within 100 using pictures or other visual representation
- I can describe how to combine two 2-digit numbers using strategies based on:
  - Place value
  - Properties of operations
  - The relationship between addition and subtraction
  - Decomposing and composing numbers
- I can add numbers fluently with:
  - Accuracy (correct answer)
  - Efficiency (a reasonable number of steps and amount of time)
  - Flexibility (using various strategies)
- I can illustrate subtraction within 100 using pictures or other visual representation
- I can describe how to subtract two 2-digit numbers using strategies based on:
  - Place value
  - Properties of operations
  - The relationship between addition and subtraction
  - Decomposing and composing numbers
- I can subtract numbers fluently with:
  - Accuracy (correct answer)
  - Efficiency (a reasonable number of steps and amount of time)
  - Flexibility (using various strategies)
- I can illustrate addition of a string of two-digit numbers using pictures or other representation
- I can describe how to add up to four two-digit numbers using strategies based on:
  - Place value
  - Properties of operations
- I can illustrate addition of a string of two-digit numbers using pictures or other representation
- I can describe how to add up to four two-digit numbers using strategies based on:
  - Place value

- Properties of operations
- I can explain for any problem involving adding and subtracting within 1000:
  - The reasoning used to solve the problem
  - The connection between the strategy used and a written method or equation
- I can represent adding within 1000 using any combination of models, drawings, words, pictures, or objects
- I can describe the strategy used to add numbers within 1000
  - (e.g. strategies should be based on place value, properties of operations, and/or the relationship between addition or subtraction)
- I can represent subtracting within 1000 using any combination of models, drawings, words, pictures, or objects
- I can describe the strategy used to subtract numbers within 1000
  - (e.g. strategies should be based on place value, properties of operations, and/or the relationship between addition or subtraction)
- I can use mental strategies (e.g., number patterns, counting on, mental images of blocks, number lines, etc.) to add 10 or 100 to a given number
- I can explain how to mentally find 10 or 100 more than a given number without counting to quickly solve a problem
- I can use mental strategies (e.g., number patterns, counting back, mental images of blocks, number lines, etc.) to subtract 10 or 100 from a given number
- I can explain how to mentally find 10 or 100 less than a given number without counting to quickly solve a problem
- I can use drawings, objects, and words to describe why addition strategies using place value and the properties of operations work to solve problems
- I can use drawings, objects, and words to describe why subtraction strategies using place value and the properties of operations work to solve problems
- I can decide which operation is needed to solve one-step word problems
- I can solve for the unknown number in one-step word problems within 100 in the following situations:
  - Add to/Taking from (e.g., the result, the change, or the start addends could be unknown)
  - Put together/Taking apart (e.g., the total, either addend, or both addends could be unknown)
  - Comparing (e.g., the difference, the bigger addend, or smaller addend could be unknown)
- I can explain how to solve addition or subtraction situations or word problems within 100
- I can make sense of problems and persevere in solving them
- I can write addition or subtraction equations using a symbol to represent an unknown value
- I can represent various addition and subtraction situations (e.g., using cubes, place value materials, ten frames, number lines, drawings, equations, etc.) to solve one-step and two-step word problems within 100

## **Declarative Knowledge**

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Students will understand that:

- strategies based on place value, properties of operations, and/or the relationship between addition and

subtraction are used to add and subtract fluently.

- explanations and number models are necessary to display one's addition and subtraction thinking.
- it is essential to attend to precision by reviewing one's work.
- the unknown can be in all positions in a variety of situations.
- organizing the information presented in a number story can make solving it more effective and efficient.
- place value can be used to mentally add and subtract 10 or 100 to a given number from 100-900.

## **Procedural Knowledge**

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Students will be able to:

- Add fluently within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
- Subtract fluently within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
- Add up to four two-digit numbers using strategies based on place value and properties of operations.
- Add up to four two-digit numbers using strategies based on place value and properties of operations.
- Relate the strategy used to add and subtract within 1000 to a written method.
- Add within 1000 using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
- Subtract within 1000 using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
- Mentally add 10 or 100 to a given number from 100-900.
- Mentally subtract 10 or 100 to a given number from 100-900.
- Explain why addition strategies work using place value and the properties of operations.
- Explain why subtraction strategies work using place value and the properties of operations to add and subtract.
- Solve one-step word problems that use addition and subtraction within 100 involving various situations with unknowns in all positions.
- Write a symbol for the unknown number to represent one-step problems.

## **EVIDENCE OF LEARNING**

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Refer to the 'Formative, Summative, and Benchmark Assessments' sections.

## **Alternate Assessments**

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- Portfolios

- Verbal Assessment (instead of written)
- Multiple choice

### **Formative Assessments**

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- Journal Pages
- Self-Assessments/Student Friendly Scales
- White board responses
- Exit/Entrance Tickets
- Math Talks
- Open Response

### **Summative Assessments**

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- End of Unit Assessment
- Fact Fluency Assessments
- End of Unit Self Assessment

### **Benchmark Assessments**

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- EDM BOY Assessment
- IXL Screener / Diagnostic Snapshot BOY
- IXL Diagnostic Snapshot MOY
- IXL Diagnostic Snapshot EOY

### **RESOURCES (Instructional, Supplemental, Intervention Materials)**

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#### **Core Instructional Materials:**

- Everyday Math Grade 2 Unit 5 Resources
  - Math Masters
  - Student Journal Volume 1
  - [ConnectED](#)

#### **Supplemental Materials:**

- [IXL](#)

- Illustrative Math Tasks
- EM Games
- Calendar Math

Lessons:

- 5-1
- 5-2
- 5-3
- 5-4
- [Independent Problem Solving 5a](#)
- 5-6
- 5-7
- 5-8
- 5-9
- 5-10
- [Independent Problem Solving 5b](#)
- 5-11

Calendar Math- Money skills

[Open Number Line Practice](#)

[Tim's Bakery](#)

Illustrative Math Task- Many Ways to do Addition 2: <http://tasks.illustrativemathematics.org/content-standards/2/NBT/B/7/tasks/1628>

Illustrative Math Task- Ford and Logan Add  $45+36$ : <http://tasks.illustrativemathematics.org/content-standards/2/NBT/B/5/tasks/2068>

## **INTERDISCIPLINARY CONNECTIONS**

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ELA:

Writing- Lesson 5-11

Career Readiness: Utilize Critical Thinking to Make Sense of Problems and Persevere in Solving Them

- Career Readiness: Utilize Critical Thinking to Make Sense of Problems and Persevere in Solving Them
- Technology/Multimedia: Educational Tech Application
- Science & Health: Social Emotional Learning

- Social Studies: Topography
- Visual Performing Arts: Dramatization

LA.W.2.5

With guidance and support from adults and peers, focus on a topic and strengthen writing as needed through self-reflection, revising and editing.

## **ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS**

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- simplify written directions
- visuals
- manipulatives
- graphic organizers
- sentence starters
- wait time
- additional time for tasks
- verbal responses
- illustrations
- colored number grids

See link to Accommodations & Modifications document in course folder.