

## 02. Addition and Subtraction Fact Strategies

Content Area: **Math**  
Course(s):  
Time Period: **Full Year**  
Length: **6 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:

- doubles and combinations of 10
- the making-10 strategy
- the near-doubles strategy
- the turn-around rule for addition
- even numbers and equal addends
- name-collection boxes
- frames and arrows
- addition number stories
- fact families
- subtraction from addition: think addition
- using doubles to subtract
- going-back-through 10 strategy for subtraction
- going-up through-10 strategy for subtraction
- subtraction strategies: counting up and counting back

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

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#### **Enduring Understandings:**

- There are many ways to represent a number.
- Number sense develops through experience.
- Operations create relationships between numbers.
- Addition involves adding to and putting together
- Subtraction involves taking from, taking apart and comparing.
- Missing numbers in a math sentence can be found using addition and subtraction.
- A symbol can represent an unknown.
- The unknown may be located in any position in the equation.
- The relationships among the operations and their properties promote computational fluency.
- Patterns provide insights into potential relationships.
- There can be different strategies to solve a problem, but some are more effective and efficient than others are.
- The location of digits in a number determines the value of each number.
- To compare two numbers, one must compare the digits in each place starting with the largest.

## Essential Questions:

- How do I determine the best numerical representation (pictorial, symbolic, objects) for a given situation?
- How does finding the common characteristics among similar problems help me to be a more efficient problem solver?
- How do mathematical operations relate to each other?
- How do I know which computational method and resources to use?
- How can one find the total parts?
- How can one find the missing part of a whole?
- How do I describe a pattern?
- How can patterns be used to make predictions?
- How do I decide what strategy will work best in a given problem situation?
- What do I do when I get stuck?
- Why is place value important?
- What are strategies for finding addition facts?
- What are strategies for finding subtraction facts?

## 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.OA.B.2 | Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.  |
| MA.K-12.4   | Model with mathematics.  |
| MA.2.OA.C.3 | Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.  |
| MA.K-12.5   | Use appropriate tools strategically.   |

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| 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.  |
| MA.2.NBT.A.2 | Count within 1000; skip-count by 5s, 10s, and 100s.   |
| 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.9 | Explain why addition and subtraction strategies work, using place value and the properties of operations.   |

## **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.W.2.8        | Recall information from experiences or gather information from provided sources to answer a question.   |
| 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. |
| 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).  |
| TECH.9.4.2.CT.3 | Use a variety of types of thinking to solve problems (e.g., inductive, deductive).  |

## **STUDENT LEARNING TARGETS**

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- I can count on or count back from any number within 1000
- I can count by: 5s, 10s, and 100s within 1000
- I can illustrate addition within 100 using pictures or other visual representation
- I can illustrate subtraction within 100 using pictures or other visual representation
- I can use drawings, objects, and words to describe why addition strategies using place value and the properties of operations work to solve problem
- 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 situation
  - Add to/Taking from (e.g., the result, the change, or the start addends could be unknown)
- I can add fluently within 20 showing:
  - Accuracy (correct answer)
  - Efficiency (a reasonable amount of steps in 3-5 seconds without counting)
  - Flexibility (using various strategies)
- I can describe the mental strategies used to add within 20 (e.g., counting on, making tens, fact families, doubles, doubles plus one)
- I can subtract fluently within 20 showing:
  - Accuracy (correct answer)
  - Efficiency (a reasonable number of steps in 3-5 seconds without counting)
  - Flexibility (using various strategies)

- I can describe the mental strategies used to subtract within 20 (e.g., counting back, decomposing a number leading to a ten, fact families, doubles minus one, etc.)
- I can write an equation to show that an even number is a sum of two equal addends

## **Declarative Knowledge**

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Students will understand that:

- accuracy, efficiency, and flexibility are essential when adding and subtracting within 20
- structure and patterns can be used to add and subtract numbers
- strategies and resources can be valuable to complete addition and subtraction tasks
- diagrams can be used to organize the information in one-step word problems
- math explanations are used to defend and explain one's math thinking
- the unknown in a word problem can be in a variety of positions
- doubles facts are used to represent even numbers

## **Procedural Knowledge**

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Students will be able to:

- count within 1000
- skip count by 5s, 10s, 100s
- 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.
- 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.
- Solve one-step word problems that use addition and subtraction within 100 involving various situations with unknowns in all positions.
- Add within 20 mentally and fluently.
- Subtract within 20 mentally and fluently
- Write an equation to express an even number as a sum of two equal addends.

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

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**Core Instructional Materials:**

- Everyday Math Unit 2 Resources
  - Math Masters
  - Student Journal Volume 1

- [ConnectED](#)

## Supplemental Materials:

- [IXL](#)
- Illustrative Math Tasks
- EM Games
- Calendar Math

Additional Content-related Tasks:

Task 1: [Price It](#)

Task 2: [Missing Numbers](#)

[Back to School Color-by-addition \(within 20\)](#)

Lessons:

- 2-3
- [\(Independent\) Problem Solving 2a](#)
- 2-9
- 2-4
- 2-5
- 2-6
- 2-7
- 2-2 (This lesson is completed after addition strategies have been reviewed)
- 3-1
- 2-10 & 2-11
- [\(Independent\) Problem Solving 2B](#)
- mid unit assessment
- 3-2
- 3-3
- 3-4
- [\(Independent\) Problem Solving 3a](#)
- 3-5
- 3-6
- 3-8
- 3-9 & 3-10
- [\(Independent\) Problem Solving 3b](#)
- 2-12
- 3-7

Graham Fletcher 3-Act Math- "The Pringle Ringle," "Whopper Jar"

Illustrative Math- Saving Money 2 <https://tasks.illustrativemathematics.org/content-standards/2/NBT/B/5/tasks/1309>

Illustrative Math- Building Toward Fluency: <http://tasks.illustrativemathematics.org/content-standards/2/OA/B/2/tasks/1394>

Illustrations- "Grouping and Grazing" <https://www.nctm.org/Classroom-Resources/Illuminations/Interactives/Grouping-and-Grazing/>

## **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
- Modified Rubrics
- Performance Based Assessments

## **Summative Assessments**

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

## **Formative Assessments**

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- Journal Pages
- Self-Assessments/Student Friendly Scales
- White board responses
- Exit/Entrance Tickets

- Math Talks
- Open Response 3-1

## **Benchmark Assessments**

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

## **INTERDISCIPLINARY CONNECTIONS**

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ELA:

Writing- Written explanation and revision work in lessons 2-7 & 3-1

Read Alouds:

- Two of Everything: A Chinese Folktale by Lily Toy Hong (2-3)
- One Odd Day by Doris Fisher and Dani Sneed (2-9)
- My Even Day by Doris Fisher and Dani Sneed (2-9)

- Career Readiness: Utilize Critical Thinking to Make Sense of Problems and Persevere in Solving Them
- Technology/Multimedia: Educational Tech Application
- Science: Environmental Literacy
- Social Studies: Current Events

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.2.2

Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.

## **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.