

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

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

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

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

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.

MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.2.NBT.A.2	Count within 1000; skip-count by 5s, 10s, and 100s.
MA.K-12.8	Look for and express regularity in repeated reasoning.
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)

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

- 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

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

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)

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>

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

EVIDENCE OF LEARNING

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

Alternate Assessments

- Portfolios
- Verbal Assessment (instead of written)
- Multiple choice
- Modified Rubrics
- Performance Based Assessments

Summative Assessments

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

Formative Assessments

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

- Math Talks
- Open Response 3-1

Benchmark Assessments

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

INTERDISCIPLINARY CONNECTIONS

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

- 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.