Unit 2: Fluently Add and Subtract within 20

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Unit 2: Fluently Add and Subtract within 20

Department of Curriculum and Instruction

Belleville Public Schools

Curriculum Guide

Mathematics: Grade 1

Unit 2: Fluently Add and Subtract Within 20

Belleville Board of Education

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Unit Overview

Unit 2 will cover three topics including (T3) Addition Facts to 20: Use Strategies, (T4) Subtraction Facts to 20: Use Strategies, and (T5) Work with Addition and Subtraction Equations.

Enduring Understandings

Topic 3 focuses on:

- Students can solve an addition problem by using a number line to count on.
- Students can solve addition problems by counting on an open number line.
- Doubles facts have the same number for both addends and can be used to solve problems involving real-world solutions.
- Basic addition facts that are near doubles can be found by using related doubles facts.
- Some addition facts can be solved by changing them to an equivalent fact with 10.
- There are different ways to solve addition facts. Certain strategies may be easier to use for different facts.
- Objects, drawings, and equations can help you solve different types of word problems.
- Good math thinkers use math to explain why they are right. They can talk about the math that others do, too.

Topic 4 focuses on:

- When using a number line to subtract, you can count back the number of spaces you are subtracting or find the distance between the two numbers.
- Some subtraction facts can be simplified by making use of the numbers' relationships to 10.
- The inverse relationship between addition and subtraction can be used to find subtraction facts; every subtraction fact has at least one related addition fact.
- There are different ways to solve subtraction facts. Certain strategies might be easier to use for different facts.

- Objects, drawings, and equations can help you solve different types of word problems.
- Good math thinkers know how to think about words and numbers to solve problems.

Topic 5 focuses on:

- Models and relationships between addition and subtraction can be used to solve equations with an unknown part.
- An addition or subtraction equation is true if the values on each side of the equal sign are the same. An addition or subtraction equation is false if the values on each side of the equal sign are not the same.
- An addition or subtraction equation is true if the values on each side of the equal sign are the same. Models, addition facts, and subtraction facts can be used to solve equations with an unknown part.
- Numbers can be grouped in different ways to solve word problems with three addends.
- Three numbers can be grouped and added in any order.
- Objects, drawings, diagrams, and equations can help you solve different types of word problems.
- Good math thinkers are careful about what they write and say, so their ideas about math are clear.

Essential Questions

(T3): Addition Facts to 20: Use Strategies

- How can you use a number line to count on to solve an addition problem?
- How can you use an open number line to count on to add?
- How do you know if an addition fact is an doubles fact?
- How can you use a related doubles fact to solve a doubles-plus-1 fact?
- How can you use a related doubles fact to solve a doubles-plus-2 fact?
- How can you solve an addition fact by changing it to an equivalent fact with 10?
- How can different strategies help you solve addition facts?
- What are some strategies that you can use to solve comparison problems and other kinds of addition problems?
- What can you do to decide if you agree or disagree with someone's thinking about the way he or she solved a problem?

(T4): Subtraction Facts to 20: Use Strategies

- What are two ways you can use a number line to subtract?
- How can making ten help you subtract?
- How can fact families help you solve addition and subtraction problems?
- How can you use addition facts you know to help you solve subtraction facts?
- What are some different ways to solve subtraction facts? How do you decide which strategy to use?
- How can objects, drawings, and equations help you solve different types of word problems?
- How can you write a word problem for an equation?

(T5): Work with Addition and Subtraction Equations

- How can I use models or the relationship between addition and subtraction to solve equations with an unknown part?
- How can you decide if an equation is true or false?
- How can you find the missing number in an equation in order to make the equation true?
- Why can you group numbers in different ways in order to solve a word problem with three addends?
- What are some strategies that you can use to help you add three numbers?
- How can you solve comparison problems?
- How can you use precision in order to find the missing number or symbol that will make an equation true?

Exit Skills

Topic 3: Use strategies to add within 20

Topic 4: Use strategies to subtract within 20

Topic 5: Work with addition and subtraction equations

New Jersey Student Learning Standards (NJSLS-S)

The Math Practices, as put forth by the National Council of Teachers of Mathematics (NCTM), are connected within all lessons:

MP.1 - Make sense of problems and persevere in solving them.

MP.2 - Reason abstractly and quantitatively.

MP.3 - Construct viable arguments and critique the reasoning of others.

MP.4 - Model with mathematics.

MP.5 - Use appropriate tools strategically.

MP.6 - Attend to precision.

MP.7 - Look for and make use of structure.

MP.8 - Look for and express regularity in repeated reasoning.

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.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.1.OA.B.3	Apply properties of operations as strategies to add and subtract.
MA.1.OA.C.5	Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).
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.

Interdisciplinary Connections

- Reference the "Topic Opener" pages in TE for STEM connections, e.g. pgs. 227, 297

LA.W.1.2	Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure.
LA.W.1.8	With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.
LA.SL.1.1	Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups.
LA.SL.1.1.A	Follow agreed-upon norms for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion).
LA.SL.1.1.B	Build on others' talk in conversations by responding to the comments of others through multiple exchanges.
LA.SL.1.1.C	Ask questions to clear up any confusion about the topics and texts under discussion.
LA.SL.1.3	Ask and answer questions about what a speaker says in order to gather additional information or clarify something that is not understood.
LA.SL.1.5	Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.

Learning Objectives

After completing Unit 2, students will be able to:

Topic 3:

- Count on to add by using a number line.
- Count on to add by using an open number line.
- Memorize doubles facts.
- Use doubles facts to solve doubles-plus-one facts.

- Use doubles facts to solve doubles-plus-two facts.
- Make 10 to add numbers to 20.
- Solve addition problems using different strategies.
- Solve different types of addition word problems.
- Critque the reasoning of others by using known information about addition and subtraction.

Topic 4:

- Make subtraction easier by making 10 to subtract.
- Count on to subtract using ten as a landmark.
- Make addition and subtraction facts using the same three numbers.
- Use addition facts to find subtraction facts.
- Explain strategies used to solve subtraction problems.
- Solve different types of addition and subtraction problems with unknowns in different positions.
- Use reasoning to write and solve number stories.
- Use a number line to subtract by counting on and back.

Topic 5:

- Find the unknown number in an equation.
- Determine if addition and subtraction equations are true or false.
- Find the missing numbers in equations to make them true.
- Use different strategies to solve word problems with 3 addends.
- Use different strategies to add 3 numbers.
- Solve word problems involving comparisons.
- Use precision to determine the missing number or symbol in an equation.

Suggested Activities & Best Practices

- Consider Extension Activity e.g. Topic 5-1, pg. 297

- Further suggested activities embedded within each Topic

Assessment Evidence - Checking for Understanding (CFU)

- Common Formative Assessments (Formative)
- Common Summative Assessments (Summative)
- District Benchmark (Benchmark)
- Do Now

- Exit Tickets
- Higher-order Questioning / Rich Discussion
- Journals
- KWL Chart
- Performance Task (Alternative)
- Quick Check (enVisionmath)
- Quick Write
- Quizzes (Formative)
- Rubrics
- Surveys
- Surveys
- Teacher Observation Checklist
- Teacher Observation Checklist
- Think-Pair-Share
- Turn-and-Talk / Share-out
- Unit Assessments (Summative)
- WIK / WINK

Primary Resources & Materials

EnVision Math Teacher Edition

PearsonRealize.com

Ancillary Resources

New Jersey Student Learning Standards for Mathematics

NJSLS Mathematics Crosswalk

IXL Learning

NCTM Illuminations

Technology Infusion

Alignment to 21st Century Skills & Technology

Mastery and infusion of **21st Century Skills & Technology** and their Alignment to the core content areas is essential to student learning. The core content areas include:

- English Language Arts;
- Mathematics;
- Science and Scientific Inquiry (Next Generation);
- Social Studies, including American History, World History, Geography, Government and Civics, and Economics;
- World languages;
- Technology;

- Visual and Performing Arts.

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.CRP4.1	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.CRP6.1	Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.
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.
CRP.K-12.CRP11.1	Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
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.A.CS1	Understand and use technology systems.
TECH.8.1.2.A.CS2	Select and use applications effectively and productively.
TECH.8.1.2.E.1	Use digital tools and online resources to explore a problem or issue.
TECH.8.2.2.A.1	Define products produced as a result of technology or of nature.
TECH.8.2.2.A.2	Describe how designed products and systems are useful at school, home and work.

21st Century Skills/Interdisciplinary Themes

- Communication and Collaboration
- Creativity and Innovation
- Critical thinking and Problem Solving
- ICT (Information, Communications and Technology) Literacy
- Information Literacy

- Life and Career Skills
- Media Literacy

21st Century Skills

- Civic Literacy
- Environmental Literacy
- Financial, Economic, Business and Entrepreneurial Literacy
- Global Awareness
- Health Literacy

Differentiation

- Use the "Quick Check" feature on Pearson Realize (embedded in each Unit) to help determine the strategy for differentiating instruction; the "Assess and Differentiate" page will prescribe the differentiated instructional activity

Differentiations:

- Small group instruction
- Small group assignments
- Extra time to complete assignments
- Pairing oral instruction with visuals
- Repeat directions
- Use manipulatives
- Center-based instruction
- Token economy
- Study guides
- Teacher reads assessments aloud
- Scheduled breaks
- Rephrase written directions
- Multisensory approaches
- Additional time
- Preview vocabulary
- Preview content & concepts
- Story guides
- Behavior management plan
- Highlight text
- Student(s) work with assigned partner
- Visual presentation
- Assistive technology
- Auditory presentations
- Large print edition
- Dictation to scribe

Hi-Prep Differentiations:

- Alternative formative and summative assessments
- Choice boards
- Games and tournaments
- Group investigations
- Guided Reading
- Independent research and projects
- Interest groups
- Learning contracts
- Leveled rubrics
- Literature circles
- Multiple intelligence options
- Multiple texts
- Personal agendas
- Project-based learning
- Problem-based learning
- Stations/centers
- Think-Tac-Toes
- Tiered activities/assignments
- Tiered products
- Varying organizers for instructions

Lo-Prep Differentiations

- Choice of books or activities
- Cubing activities
- Exploration by interest
- Flexible grouping
- Goal-setting with students
- Jigsaw
- Mini workshops to re-teach or extend skills
- Open-ended activities
- Think-Pair-Share
- Reading buddies
- Varied journal prompts
- Varied supplemental materials

Special Education Learning (IEP's & 504's)

- Consider Intervention Activity and/or Reteach e.g. Topic 5-1, pg. 303A

- Use suggestions under Technology Center section in Pearson Realize to target students with disabilities

- Use the Pacer Center Action Information Sheet for research-based ideas on accommodations and modifications

- Allow for open-note/open-book assessments
- Check classwork frequently for understanding
- Conduct preview of content, concepts, and vocabulary
- Consider behavior management plan
- Implement accommodations/modifications as dictated in the student's IEP/504 plan
- Modified test content/format
- Modified written assignments
- Multi-sensory presentation
- Pre-annotate text
- Preferential seating
- Promote pair work
- Provide extended time on various assignments
- Provide printed/online copies of lesson notes
- Secure attention before providing instruction/directions
- Use assistive technology

English Language Learning (ELL)

- Use Teaching Tool 48 as a graphic organizer to help students connect a visual to the vocabulary term

- Use Teaching Tool 49 to connect students' understanding of vocabulary terms with actual meanings

- Use suggestions under English Language Learners section in Pearson Realize to target beginning, intermediate, and advanced learners e.g. Topic 5-1, pg. 299A

- Use suggestions under Technology Center section in Pearson Realize to target ELLs

- Allow for multiple student revisions
- Allow for open-note / open-book assessments
- Allow multiple forms of student products (projects, models, slide-shows, etc.) to demonstrate student learning
- Ask and give information using key words
- Demonstrate listening comprehension by responding to questions
- Develop basic sight vocabulary
- Differentiate assessments to reflect selected objectives
- Express ideas in single words
- Leverage computer spell checker
- Modify reading assignments to correlate with lexile level

- Peer tutoring / Peer note-taking
- Speak using content area vocabulary in context
- Teacher-created Study Guide
- Use prior experiences to understanding meanings
- Use videos, illustrations, pictures, and drawings to explain or clarify

At Risk

- Decrease the amount of work represented or required by assigning the "Do You Understand?" and the "Do You Know How?" sections of each lesson

- Use suggestions under Technology Center section in Pearson Realize to target at-risk students

- Use suggestions under Intervention Activity e.g. Topic 5-1, Error Intervention, pg. 300

- Allow for multiple student revisions
- Allow for open-note / open-book assessments
- Allow multiple forms of student products (projects, models, slide-shows, etc.) to demonstrate student learning
- Allow students to select from given assignment choices
- Differentiate assessments to reflect selected objectives
- Mark students' correct and acceptable work, not the mistakes
- Peer tutoring / Peer note-taking
- Promote student collaboration on in-class / outside class assignments
- Reduce lengthy outside reading assignments
- Teach key aspects of a topic - eliminate non-essential information
- Teacher-created Study Guide
- Use authentic assessments with real-life problem-solving
- Use videos, illustrations, pictures, and drawings to explain or clarify

Talented and Gifted Learning (T&G)

- Use suggestions under Extension for Early Finishers section in Pearson Realize to target advanced learners

- Use suggestions under Advanced Activity Centers to target advanced learners e.g. Topic 5-1, pg. 303A

- Administer Unit Assessment to determine level of proficiency
- Allow gifted children to create and publish a class newspaper to distribute
- Allow students to work at a faster pace
- Complete activities aligned with above grade-level text using Benchmark results
- Consider parental input about the education of their gifted children
- Create a blog or social media page about a topic of interest
- Create a plan to solve an issue presented in the class or in a text

- Debate issues with research to support arguments
- Involve students in academic contests
- Promote advanced problem-solving
- Remember that gifted children may not excel in all areas
- Set individual goals
- Utilize exploratory connections to higher-grade concepts
- Utilize project-based learning for greater depth of knowledge