Unit 2 Fluently Add and Subtract Within 20

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Title Section

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 focuses on addition and subtraction equations to 20.

Students will:

- Adapt addition strategies and use the make-ten strategy to add within 20.
- Be introduced to key strategies for solving subtraction facts to 20.
- Gain a deeper understanding of the relationship between addition and subtraction
- Develop an understanding that the equal sign indicates that both sides of an equation represent the same value
- Determine whether addition and subtraction equations are true or false and find the missing number in addition and subtraction equations

Topic 5 is also an introduction to the Associative Property of Addition being used as a way to group number flexibly to solve problems with three addends.

(Reference topics 3, 4, and 5 in the teacher's edition)

NJSLS

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.B.4	Understand subtraction as an unknown-addend problem.
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.

Exit Skills

By the end of Grade 1 Mathematics, students in the Belleville Public Schools will be able to:

- **Develop an understanding of addition, subtraction, and strategies for addition and subtraction within 20:**

Students develop strategies for adding and subtracting whole numbers. They use a variety of methods, including discrete objects, to model add-on, take from, put-together, take-apart, and compare situations to develop meaning for the operations of addition and subtraction, and to develop strategies to solve arithmetic problems with these operations. Students understand connections between counting and addition and subtraction (e.g., adding two is the same as counting on two). They use properties of addition to add whole numbers and to create and use increasingly sophisticated strategies based on these properties (e.g., ?making tens?) to solve addition and subtraction problems within 20. By comparing a variety of solution strategies, children build their understanding of the relationship between addition and subtraction.

- **Develop an understanding of whole number relationships and place value, including grouping in tens and ones:**

Students develop, discuss, and use efficient, accurate, and generalizable methods to add within 100 and subtract multiples of 10. They compare whole numbers (at least to 100) to develop understanding of and solve problems involving their relative sizes. They think of whole numbers between 10 and 100 in terms of tens and ones (especially recognizing the numbers 11 to 19 as composed of a ten and some ones). Through activities that build number sense, they understand the order of the counting numbers and their relative magnitudes.

- **Develop an understanding of linear measurement and measuring lengths as iterating length units:**

Students develop an understanding of the meaning and processes of measurement, including underlying concepts such as iterating (building up the length of an object with equal-sized units) and the transitivity principle for indirect measurement.

- **Reason about attributes of, and composing and decomposing geometric shapes:**

Students compose and decompose plane or solid figures to build understanding of part-whole relationships as well as the properties of the original and composite shapes. As they combine shapes, they recognize them from different perspectives and orientations, describe their geometric attributes, and determine how they are alike and different, to develop the background for measurement and for initial understandings of properties such as congruence and symmetry.

Enduring Understanding

Topic 3:

- Students can solve an addition problem by using a number line to count on.
- Doubles facts have the same number for both addends.
- Some addition facts can be solved by changing them to an equivalent fact with 10.
- There are different strategies for solving addition facts.
- Objects, drawings, and equations can help you solve different types of word problems.

Topic 4:

- Some subtraction facts can be simplified by making use of the numners' relationships to 10.
- The inverse relationship between addition and subtracion can be used to find subtraction facts.
- Every subtraction fact has at least one related addition fact.
- There are different strategies for solving subtraction facts.

Topic 5:

- Models and the relationship 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.
- Numbers can be grouped in different ways to solve word problems.
- Three numbers can be grouped and added in any order.

Essential Questions

- **What strategies can you use for adding to 20?**
- **What strategies can you use while subtracting?**
- **How can adding and subtracting help you solve or complete equations?**

Learning Objectives

After completing Unit 2, students will be able to:

Topic 3:

- **Count** on to add using a number line.
- **Memorize** doubles facts.
- **Use** doubles facts to solve doubles-plus-one facts and doubles-plus-2 facts.
- **Make** 10 to add numbers to 20.
- **Solve** addition word problems.

Topic 4:

- **Use** a number line to subtract by counting back.
- **Make** a 10 to subtract.
- **Make** addition and subtraction facts using the same three numbers.
- **Use** addition facts to find subtraction facts.
- **Solve** different types fo addition and subtraction problems with unknonwns in different positions.

Topic 5:

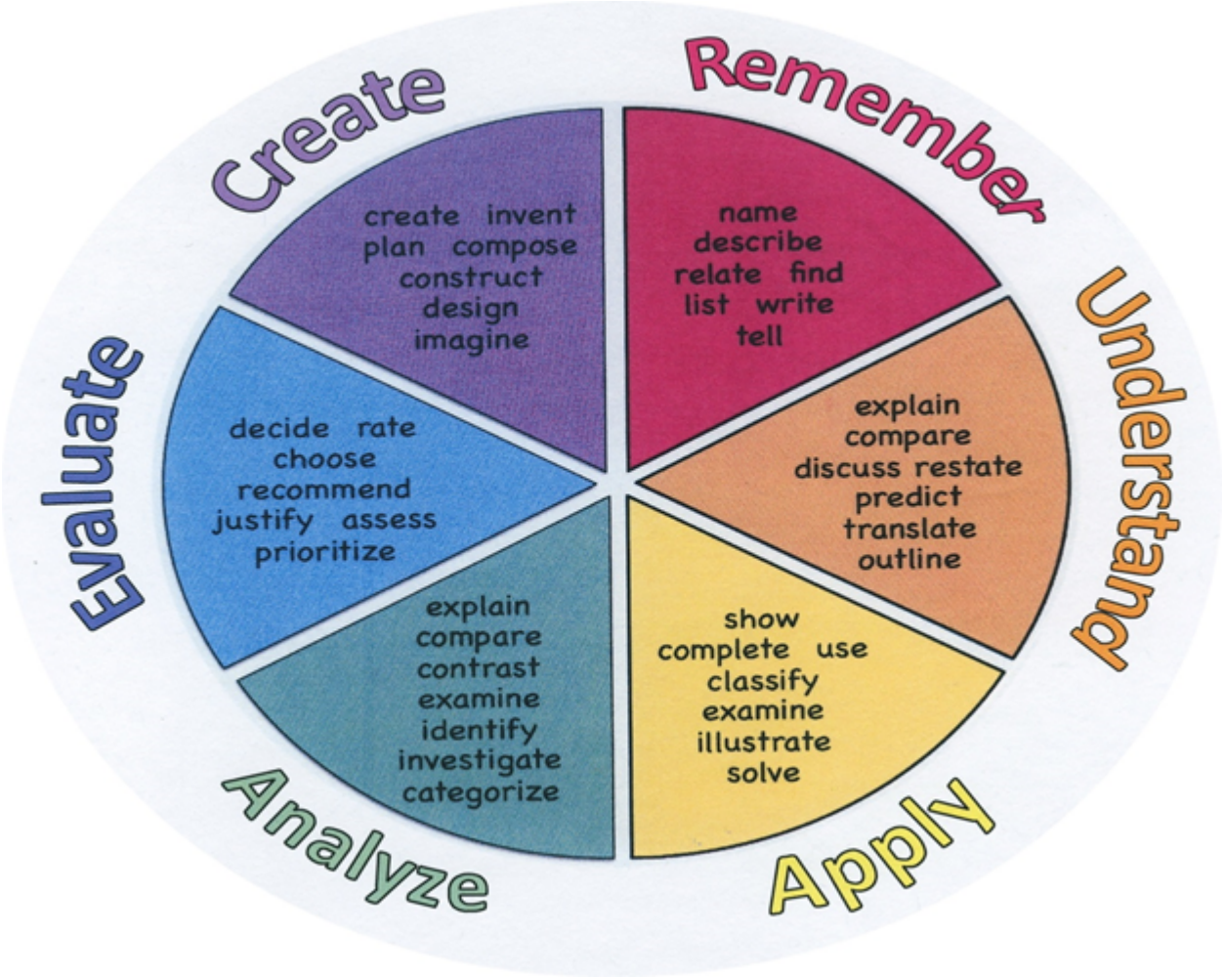
- **Find** the unknown number in an equation.
- **Determine** if addition and subtraction eqiations are true or false.
- **Find** the missing numbers in equations to make them true.
- **Use** different strategies to solve world problems with 3 addends.
- **Solve** word problems involving comparisons.

Action Verbs

Below are examples of action verbs associated with each level of the Revised Bloom's Taxonomy. These are useful in writing learning objectives, assignment objectives and exam questions.

Remember	Understand	Apply	Analyze	Evaluate	Create
Choose	Classify	Choose	Categorize	Appraise	Combine
Describe	Defend	Dramatize	Classify	Judge	Compose
Define	Demonstrate	Explain	Compare	Criticize	Construct
Label	Distinguish	Generalize	Differentiate	Defend	Design
List	Explain	Judge	Distinguish	Compare	Develop
Locate	Express	Organize	Identify	Assess	Formulate
Match	Extend	Paint	Infer	Conclude	Hypothesize
Memorize	Give Examples	Prepare	Point out	Contrast	Invent
Name	Illustrate	Produce	Select	Critique	Make

Omit Recite Select State Count Draw Outline Point Quote Recall Recognize Repeat Reproduce	Indicate Interrelate Interpret Infer Match Paraphrase Represent Restate Rewrite Select Show Summarize Tell Translate Associate Compute Convert Discuss Estimate Extrapolate Generalize Predict	Select Show Sketch Solve Use Add Calculate Change Classify Complete Compute Discover Divide Examine Graph Interpolate Manipulate Modify Operate Subtract	Subdivide Survey Arrange Breakdown Combine Detect Diagram Discriminate Illustrate Outline Point out Separate	Determine Grade Justify Measure Rank Rate Support Test	Originate Organize Plan Produce Role Play Drive Devise Generate Integrate Prescribe Propose Reconstruct Revise Rewrite Transform



Interdisciplinary Connections

Each topic has an interactive story and a STEM component.

Topic 3: Math and Science Project (STEM): What Do They Eat?

- Tell students that all animals need food to survive, and that different animals eat different things. Explain that animals can be grouped depending on what they eat: plant eaters are called herbivores; meat eaters are called carnivores, and the ones that eat meat and plants are called omnivores. Encourage students to talk about animals they are familiar with and what those animals like to eat.
- Direct students' attention to the photograph. They encourage them to compare the teeth on both animals and to share their opinions about how the shapes of the teeth help them eat their food.
- Explain to students that some animals eat other animals and the process is called the food chain. Draw a grasshopper, frog, snake, and eagle. Hae students draw an arrow from each animal to its predator. Partners can draw and share a food chain with the class.
- Make and solve addition problems about animals and what they eat.

Reference the "Topic Opener" pages in teacher's edition for STEM projects for topics 4 (pg. 227 and 5 (pg. 297).

LA.K-12.NJSLSA.R	Reading
SCI.K-2-ETS1-1	Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
TECH.8.1.2	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

Alignment to 21st Century Skills & Technology

Key SUBJECTS AND 21st CENTURY THEMES

Mastery of key subjects and 21st century themes is essential for all students in the 21stcentury.

Key subjects include:

- English, reading or language arts
- World languages
- Arts
- Mathematics
- Economics
- Science
- Geography

- History
- Government and Civics

21st Century/Interdisciplinary Themes

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

21st Century Skills

- 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

Technology Infusion

EnVision 2.0 Digital Resources, SMART Board

Differentiation

As a Reminder:

The basis of good differentiation in a lesson lies in differentiating by content, process, and/or product.

Resources:

- NJDOE: Instructional Supports and Scaffolds for Success in Implementing the Common Core State Standards http://www.state.nj.us/education/modelcurriculum/success/math/k2/
- enVision math 2.0 Technology Center,
- On-Level and Advanced Activity Centers

- Math Diagnosis and Intervention System 2.0 (accessed through PearsonRealize.com)
- Monitor progress, reteach as needed, and extend student thinking.
- Assess to identify students needs and then provide appropriate support.
- As needed, provide more instruction that is on level or below grade level for the students who are struggling.
- Use vocabulary cards, vocabulary activities, vocabulary review, and vocabulary glossary.
- Utilize **Quick Check** found in order to determine differentiation of instruction.
- **Assess and differentiate** page will prescribe the differentiated instruction activity.

Special Education

- printed copy of board work/notes provided
- additional time for skill mastery
- assistive technology
- behavior management plan
- Center-Based Instruction
- check work frequently for understanding
- computer or electronic device utilizes
- extended time on tests/ quizzes
- have student repeat directions to check for understanding
- highlighted text visual presentation
- modified assignment format
- modified test content
- modified test format
- modified test length
- multiple test sessions
- multi-sensory presentation
- preferential seating
- preview of content, concepts, and vocabulary
- reduced/shortened reading assignments
- Reduced/shortened written assignments
- secure attention before giving instruction/directions
- shortened assignments
- student working with an assigned partner
- teacher initiated weekly assignment sheet
- Use open book, study guides, test prototypes

ELL

- teaching key aspects of a topic. Eliminate nonessential information
- using videos, illustrations, pictures, and drawings to explain or clarif
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning;
- allowing students to correct errors (looking for understanding)
- allowing the use of note cards or open-book during testing
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using computer word processing spell check and grammar check features
- using true/false, matching, or fill in the blank tests in lieu of essay tests

Intervention Strategies

- allowing students to correct errors (looking for understanding)
- teaching key aspects of a topic. Eliminate nonessential information
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning
- allowing students to select from given choices
- allowing the use of note cards or open-book during testing
- collaborating (general education teacher and specialist) to modify vocabulary, omit or modify items to reflect objectives for the student, eliminate sections of the test, and determine how the grade will be determined prior to giving the test.
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- marking students' correct and acceptable work, not the mistakes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using authentic assessments with real-life problem-solving
- using true/false, matching, or fill in the blank tests in lieu of essay tests
- using videos, illustrations, pictures, and drawings to explain or clarify

Evidence of Student Learning-CFU's

Please list ways educators may effectively check for understanding in this secion.

- Admit Tickets
- Anticipation Guide
- Common benchmarks
- Compare & Contrast
- Create a Multimedia Poster
- Define
- Describe
- Evaluate
- Evaluation rubrics
- Exit Tickets
- Explaining
- Fist- to-Five or Thumb-Ometer
- Illustration
- Journals
- KWL Chart
- Newspaper Headline
- Outline
- Question Stems
- Quickwrite
- Quizzes
- Red Light, Green Light
- Self- assessments
- Socratic Seminar
- Study Guide
- Teacher Observation Checklist
- Think, Pair, Share
- Think, Write, Pair, Share
- Top 10 List
- Unit tests

Primary Resources

EnVision Math 2.0, EnVision Math 2.0 Digital Resources

Ancillary Resources

Teachers Pay Teachers

http://interactivesites.weebly.com

http://www.mindmeister.com/173843166/free-learning-websites-for-elementary-students

www.factmonster.com

www.mathabc.com

www.mathblaster.com

www.ixl.com/math/grade-1

www.education.com

www.math-aids.com