Unit 1: Interpreting Data, Extending Counting, and Solving Addition and Subtraction Problems to 10

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Department of Curriculum and Instruction

Belleville Public Schools

Curriculum Guide

Mathematics: Grade 1

Unit 1: Interpreting Data, Extending Counting, and Solving Addition/Subtraction Problems to 10

Belleville Board of Education

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Unit Overview

Unit 1 will cover four topics including (T1) Solve Addition and Subtraction Problems to 10, (T2) Fluently Add and Subtract within 10, (T6) Represent and Interpret Data, and (T7) Extend the Counting Sequence.

Enduring Understandings

Topic 1 focuses on:

- Adding to is one interpretation of addition. Addition equations can be used to show add to addition situations.
- Putting two parts together to make a whole is one interpretation of addition. Addition equations can be used to show situations in which two parts are put together.
- Decomposing numbers can be used with addition word problems in which the total is known, but the parts are unknown. Addition equations can be used to show addition situations where both parts are unknown
- Taking away one part from a whole is one interpretation of subtraction. Subtraction equations can be used to show subtraction situations in which one part is taken from a whole.
- Comparing two groups to find how many more objects are in one group than are in another group is one interpretation of subtraction. Subtraction equations can be used to show situations in which two quantities are compared.
- Comparing to groups to find how many fewer objects are in one group, than another group, is one interpretation of subtraction. Subtraction equations can be used to show situations in which two groups are compared.
- Finding a missing part of a whole is an interpretation of both addition and subtraction. Addition or subtraction equations can be used to show situations involving a missing part.

- Good math thinkers use math to explain why they are right. They can talk about the math that others do, too.

Topic 2 focuses on:

- You can count on to find the sum for addition facts. A number line can help you count on.
- Doubles facts have the same number for both addends and can be used to solve problems involving real-world situations.
- Basic addition facts that are near doubles can be found using a related doubles fact.
- Facts with sums 6 through 10 can be broken into 5 plus some number.
- Two numbers can be added in any order and the sum will stay the same.
- You can count back to find the difference for subtraction facts. A number line can help you count back.
- Addition and subtraction have an inverse relationship. This relationship can be used to solve subtraction facts; every subtraction fact has a related addition fact.
- Drawings and equations can help you solve different types of word problems.
- Good math thinkers look for patterns in math to help solve problems.

Topic 6 focuses on:

- Tally charts are useful in recording and organizing some kinds of data.
- A picture graph uses pictures to show and organize data.
- Some problems can be solved by making, reading, and analyzing a tally chart or picture graph.
- Good math thinkers know what the problem is about. They have a plan to solve it, and they keep trying if they get stuck.

Topic 7 focuses on:

- The decade numbers are built on groups of 10. The oral names are similar, but not the same as the number of tens counted.
- Counting forward by 1s to 120 follows the same place-value counting rules as counting forward by 1s to two-digit numbers.
- Counting and place value patterns can be seen on a number chart.
- An open number line can be used to show counting by tens and ones.
- The number of objects in a group is determined by the last number said when counting. A written numeral represents the number of objects in a group.
- Counting objects by tens then ones can help you count objects faster than counting by just ones.
- Good math thinkers look for things that repeat in a problem. They use what they learn from one problem to help them solve other problems.

Essential Questions

(T1): Solve Addition and Subtraction Problems to 10

- How can you use an addition equation to solve a problem about adding to one part?
- How can you use an equation to solve a problem about putting two parts together?
- How can you use parts of numbers to solve problems in which both of the addends are unknown?
- How can you use a subtraction equation to show a situation in which one part is taken from a whole?
- How can you write a subtraction equation to compare two sets of objects?

- How can you use an addition equation to find the missing part of a whole?
- How can you use a model to find the missing part in a problem and write an addition or subtraction equation for that problem?
- How can you solve problems by making a math argument using addition and subtraction?

(T2): Fluently Add and Subtract within 10

- How can you count on to add 1, 2, or 3 to a number?
- How do you know if an addition fact is a doubles fact?
- How can you use a doubles fact to solve a near doubles fact?
- How can you use a ten-frame to show an addition fact that has 5 as one of the addends and an addition fact with a sum of 10?
- If the order of the addends is changed in an addition equation, does the sum change? Explain.
- How can you count back to subtract 0, 1, 2, or 3 from a number?
- How can you use an addition fact to solve a related subtraction fact?
- How can you draw a picture and use an equation to solve a problem?
- How can you use the structure of a table to identify patterns?

(T6): Represent and Interpret Data

- How can you use a tally chart to record different types of data?
- How can you use data collected in a tally chart to make a picture graph?
- How can you use the information in a tally chart or picture graph to answer questions?
- How can you use a tally chart or picture graph to solve a word problem?
- How can you make sense of a problem about data and use perseverance to solve it?

(T7): Extend the Counting Sequence

- How can you use patterns to count by 10?
- How is counting forward from 100 to 120 like counting forward to a two digit number? How is it different?
- How does a number chart show counting?
- What patterns do you see on a number chart when you count by 10s and 1s?
- How can a number line help you count by 10s and 1s?
- How can you write a number to show how many objects are in a group?
- How can you use what you learned in one problem to help you solve another problem?

Exit Skills

Topic 1: Represent and solve problems involving addition and subtraction

Topic 2: Add and subtract within 10

Topic 6: Represent and interpret data

Topic 7: Extend the Counting Sequence

New Jersey Student Learning Standards (NJSLS)

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.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.8	Determine the unknown whole number in an addition or subtraction equation relating to three whole numbers.
MA.1.NBT.A.1	Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
MA.1.MD.C.4	Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Interdisciplinary Connections

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 1, students will be able to:

Topic 1:

- Solve addition problems involving situations of adding one part to another part.
- Solve addition problems involving situations of putting two parts together.
- Solve addition word problems by breaking apart a total number of objects.
- Solve subtraction problems involving taking from a group.
- Solve subtraction problems that involve comparing to find how many more objects are in one group than another group.
- Solve subtraction problems than involve comparing to find how many fewer objects are in one group than another group.
- Solve addition problems by finding the missing addend.
- Solve problems involving putting together or taking apart.
- Construct math arguments in order to solve addition and subtraction problems.

Topic 2:

- Add by counting on from a number.
- Use doubles to solve problems.
- Solve problems using neat doubles facts.
- Use a ten-frame to solve addition facts with 5 and 10.
- Use the same addend to write two different equations with the same sum.
- You can count back to find the difference for subtraction facts. A number line can help you count back.
- Use addition facts to 10 to solve subtraction problems.
- Solve problems by drawing pictures and writing quantities.
- Use structure and identify patterns in order to solve problems.

Topic 6:

- Organizing data into categories.
- Collect and organize information using a picture graph.
- Interpret organized data.
- Use a picture graph to interpret data.
- Use perseverance to solve problems about a set of data.

Topic 7:

- Count by 10s to 120.
- Count by 1s to 120.
- Count on a number chart to 120.
- Find number patterns on a number chart.
- Count to 120 using an open number line.
- Write numerals to show how many objects are in a group.
- Find better and faster ways to solve problems.

Suggested Activities & Best Practices

- "Math and Science Project," Pearson Realize, pg. 75, for Topic 2, for example

- 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
- Learning Center Activities
- Performance Task (Alternative)
- Quick Check (enVisionmath)
- Quick Write
- Quizzes (Formative)
- Rubrics
- Surveys

- Surveys
- 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)

- Game Center Online pg. 750

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

pgs. 13-14

- 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. pg. 15A

- 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. pg. 13A

- 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. pg. 13A

- 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

Sample Lesson

Unit Name: Interpreting Data, Extending Counting, and Solving Addition/Subtraction Problems to 10

(Topic 1, Lesson 1-1 Solve Problems: Add To)

NJSLS: 1.OA.A.1

Interdisciplinary Connection: Reading, Science, STEM

Statement of Objective: Solve addition problems involving situations of adding one part to another part.

Anticipatory Set/Do Now: Solve-and-Share Problem: Provide each student with 5 cubes of the same color to model the problem. In this problem, students use cubes to model a problem in which one part is joined to another part. (Problem: Jada has 2 cubes. She adds on 1 more cube. How many cubes does she have now? How can you show this story with cubes and an addition equation? (pg. 9 in the teacher's edition and the student edition) Building understanding: Model problem the story problem. Ask guided questions as needed. Share and Discuss Solutions: Have students share how they found the total number of cubes.

Learning Activity: Students will solve story problems using their cubes to model and explain their reasoning. Complete pages 10-12 in student workbook.

Student Assessment/CFU's: Assessment: Topic 1, Lesson 1 Leveled Assessment, Homework, Teacher Observation

CFU's: Fist-to-Five or Thumb-Ometer, Exit Ticket

Materials: Connecting cubes, counters, student workbook

21st Century Themes and Skills: Communication and Collaboration, Critical Thinking and Problem Solving, Global Awareness, Environmental Literacy

Differentiation/Modifications:

- On-Level and Advanced Activity Centers: Students use their hands to show two parts of a number, and then say how many in all. In the Advanced version, students use red and blue squares and a part-part mat to show two parts of a number before telling how many in all.
- 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

Integration of Technology: SMART Board, EnVision Math 2.0 Digital Resources