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

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Title Section

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

In Unit 1, you will cover a variety of topics related to basic math principals, extending the counting sequence, and interpreting data. These topics will include:

- Expands on what students know about addition and subtraction
- Students will develop a deep understanding by working on "add to," "put together," "take from," and "compare" problems.
- Extend what students learned related to solving addition and subtraction problems to 10
- Develop fluency with adding and subtracting within 10 using various strategies (counting on, counting back, using doubles, adding 5, adding to 10, adding in any order, and thinking addition to subtract)
- Students will explore concepts of data analysis involving up to three categories of data.
- Students will collect, organize, represent, and interpret data.
- Focuses on counting to 120 by tens and ones, reading and writing numbers to 120, and representing a number of objects with a written numeral for quantities to 120

(Reference topics 1,2,6, and 7 in the teacher's edition)

NJSLS

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.
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.NBT.B.2c	The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

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 1:

- Addition equations can be used to show addition situations, situations in which two parts are put together, or where both parts are unknown.
- Subtraction equations can be used to show subtraction situations in which one part is taken from the whole, in which two quantities are compared, or in which two groups are compared.

Topic 2:

- You can count on to find the sum for addition facts.
- Doubles facts have the same number for both addends.
- Facts with sums 6-10 can be broken into 5 plus another 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.
- Addition and subtraction have an inverse relationship.

Topic 6:

- Tally charts are useful in recording and organizing data.
- A picture graph uses pictures to show and organize data.
- Some problems can be solved by making, reading, and analyzing a tally cahrt or picture graph.

Topic 7:

- Counting forward by 1s to 120 follows the same place-value rules as counting forward by 1s to two-digit numbers.
- Counting and place-value patterns can be seen on a number chart.
- Counting objects by tens and then ones can help you count objects faster than counting by just ones.

Essential Questions

- **What are ways to think about addition and subtraction?**
- **What strategies can you use while adding and subtracting?**
- **What are some ways you can collect, show, and understand data?**
- **How can you use what you already know about counting to count past 100?**

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 the parts together.
- **Solve** subtraction problems involving taking from a group
- **Solve** subtraction problems that involve comparing to find out how many more objects are in one group than another group.
- **Solve** addition problems by finding a missing addend.

Topic 2:

- **Add** by counting on from a number.
- **Use** doubles to solve problems.
- **Use** a ten-frame to solve addition facts with 5 and 10
- **Use** the same addends to write two different equations with the same sum

Topic 6:

- **Organize** datat into categories
- **Collect** and **organize** informatin using a picture graph
- **Interpret** organized 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.

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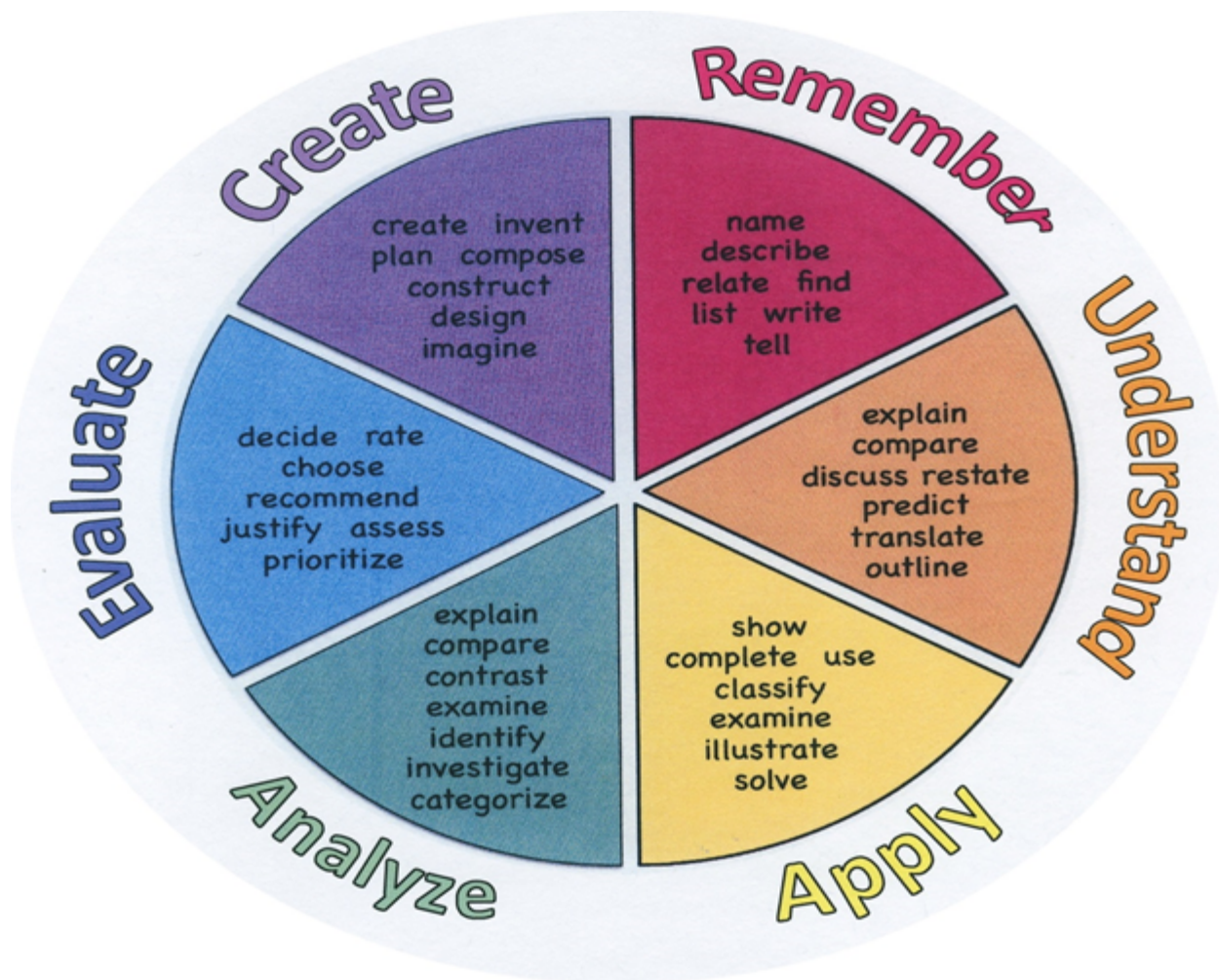
Interdisciplinary Connections

Each topic has an interactive story and a STEM component.

Topic 1: Math and Science Project (STEM) - Parents and Babies

- Have students share the kinds of baby animals they have seen. Encourage students to describe the baby animals regarding size, color, and skin type. Have students tell if the babies look like their parents, what they are called, and if they make any sound.
- Direct students' attention to the photograph. Then ask them to compare both animals.
- Have students draw a picture that relates to an addition problem they wrote.

Reference the "Topic Opener" pages in teacher's edition for STEM projects for topics 2 (pg. 75), 3 (pg.151), 6 (pg.349) , and 7 (pg. 391).

LA.K-12.NJSLSA.R	Reading
LA.K-12.NJSLSA.W	Writing
SCI.K-2-ETS1	Engineering Design
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

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. Develop:Visual Learning- 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**