Grade 1: Unit 1
Add and Subtract Within 10
Course Philosophy/Description

In mathematics, students will learn to address a range of tasks focusing on the application of concepts, skills and understandings. Students will be asked to solve problems involving the key knowledge and skills for their grade level as identified by the NJSLS; express mathematical reasoning and construct a mathematical argument and apply concepts to solve model real world problems. The balanced math instructional model will be used as the basis for all mathematics instruction.

First grade Mathematics consists of the following domains: Operations and Algebraic Thinking (OA), Numbers and Operations in Base Ten (NBT), Measurement and Data (MD), and Geometry (G). In first grade, instructional time should focus on four critical areas: (1) developing understanding of addition, subtraction, and strategies for addition and subtraction within 20; (2) developing understanding of whole number relationships and place value, including grouping in tens and ones; (3) developing understanding of linear measurement and measuring lengths as iterating length units; and (4) reasoning about attributes of, and composing and decomposing geometric shapes.

1) Students develop strategies for adding and subtracting whole numbers based on their prior work with small numbers. They use a variety of models, including discrete objects and length-based models (e.g., cubes connected to form lengths), to model add-to, 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.

2) 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.

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

4) Students compose and decompose plane or solid figures (e.g., put two triangles together to make a quadrilateral) and 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.
ESL Framework

This ESL framework was designed to be used by bilingual, dual language, ESL and general education teachers. Bilingual and dual language programs use the home language and a second language for instruction. ESL teachers and general education or bilingual teachers may use this document to collaborate on unit and lesson planning to decide who will address certain components of the SLO and language objective. ESL teachers may use the appropriate leveled language objective to build lessons for ELLs which reflects what is covered in the general education program. In this way, whether it is a pull-out or push-in model, all teachers are working on the same Student Learning Objective connected to the New Jersey Student Learning Standards. The design of language objectives are based on the alignment of the World-Class Instructional Design Assessment (WIDA) Consortium’s English Language Development (ELD) standards with the New Jersey Student Learning Standards (NJSLS). WIDA’s ELD standards advance academic language development across content areas ultimately leading to academic achievement for English learners. As English learners are progressing through the six developmental linguistic stages, this framework will assist all teachers who work with English learners to appropriately identify the language needed to meet the requirements of the content standard. At the same time, the language objectives recognize the cognitive demand required to complete educational tasks. Even though listening and reading (receptive) skills differ from speaking and writing (expressive) skills across proficiency levels the cognitive function should not be diminished. For example, an Entering Level One student only has the linguistic ability to respond in single words in English with significant support from their home language. However, they could complete a Venn diagram with single words which demonstrates that they understand how the elements compare and contrast with each other or they could respond with the support of their home language (L1) with assistance from a teacher, para-professional, peer or a technology program.

http://www.state.nj.us/education/modelcurriculum/ela/ELLOverview.pdf
<table>
<thead>
<tr>
<th>#</th>
<th>Student Learning Objective</th>
<th>NJSLS</th>
<th>Instruction: 8 weeks</th>
<th>Assessment: 1 week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Use addition and subtraction within 10 to solve problems, including word problems involving situations of adding to, taking from, putting together, taking apart, and comparing with unknowns in all positions.</td>
<td></td>
<td>LO.A.1*</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Solve addition word problems with three whole numbers with sums less than or equal to 20.</td>
<td></td>
<td>LO.A.2*</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Apply properties of operations (commutative property) as strategies to add or subtract within 10.</td>
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<td>LO.A.3*</td>
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<tr>
<td>4</td>
<td>Solve subtraction problems, within 10, by representing subtraction as an unknown addend problem and finding the unknown addend.</td>
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<td>LO.A.4*</td>
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</tr>
<tr>
<td>5</td>
<td>Count on to add and count backwards to subtract to solve addition and subtraction problems within 20.</td>
<td></td>
<td>LO.A.5</td>
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</tr>
<tr>
<td>6</td>
<td>Determine if addition and subtraction equations, within 10, are true or false.</td>
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<td>LO.A.6*</td>
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<tr>
<td>7</td>
<td>Solve addition and subtraction equations, within 10, by finding the missing whole number in any position.</td>
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<td>LO.A.7*</td>
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<tr>
<td>8</td>
<td>Count to 100 orally, read and write numerals, and write numerals to represent the number of objects (up to 100).</td>
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<td>LO.A.8</td>
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<td></td>
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<td></td>
<td>LO.NBT.A.1*</td>
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</tbody>
</table>
Research about Teaching and Learning Mathematics

Structure teaching of mathematical concepts and skills around problems to be solved (Checkly, 1997; Wood & Sellars, 1996; Wood & Sellars, 1997)
Encourage students to work cooperatively with others (Johnson & Johnson, 1975; Davidson, 1990)
Use group problem-solving to stimulate students to apply their mathematical thinking skills (Artzt & Armour-Thomas, 1992)
Students interact in ways that support and challenge one another’s strategic thinking (Artzt, Armour-Thomas, & Curcio, 2008)
Activities structured in ways allowing students to explore, explain, extend, and evaluate their progress (National Research Council, 1999)

There are three critical components to effective mathematics instruction (Shellard & Moyer, 2002):

- Teaching for conceptual understanding
- Developing children’s procedural literacy
- Promoting strategic competence through meaningful problem-solving investigations

Teachers should be:

- Demonstrating acceptance and recognition of students’ divergent ideas
- Challenging students to think deeply about the problems they are solving, extending thinking beyond the solutions and algorithms required to solve the problem
- Influencing learning by asking challenging and interesting questions to accelerate students’ innate inquisitiveness and foster them to examine concepts further
- Projecting a positive attitude about mathematics and about students’ ability to “do” mathematics

Students should be:

- Actively engaging in “doing” mathematics
- Solving challenging problems
- Investigating meaningful real-world problems
- Making interdisciplinary connections
- Developing an understanding of mathematical knowledge required to “do” mathematics and connect the language of mathematical ideas with numerical representations
- Sharing mathematical ideas, discussing mathematics with one another, refining and critiquing each other’s ideas and understandings
- Communicating in pairs, small group, or whole group presentations
- Using multiple representations to communicate mathematical ideas
- Using connections between pictures, oral language, written symbols, manipulative models, and real-world situations
- Using technological resources and other 21st century skills to support and enhance mathematical understanding
Mathematics is not a stagnate field of textbook problems; rather, it is a dynamic way of constructing meaning about the world around us, generating knowledge and understanding about the real world every day. Students should be metaphorically rolling up their sleeves and “doing mathematics” themselves, not watching others do mathematics for them or in front of them. (Protheroe, 2007)

**Balanced Mathematics Instructional Model**

Balanced math consists of three different learning opportunities; guided math, shared math, and independent math. Ensuring a balance of all three approaches will build conceptual understanding, problem solving, computational fluency, and procedural fluency. Building conceptual understanding is the focal point of developing mathematical proficiency. Students should frequently work on rigorous tasks, talk about the math, explain their thinking, justify their answer or process, build models with graphs or charts or manipulatives, and use technology.

When balanced math is used in the classroom it provides students opportunities to:

- solve problems
- make connections between math concepts and real-life situations
- communicate mathematical ideas (orally, visually and in writing)
- choose appropriate materials to solve problems
- reflect and monitor their own understanding of the math concepts
- practice strategies to build procedural and conceptual confidence

Teacher builds conceptual understanding by modeling through demonstration, explicit instruction, and think alouds, as well as guiding students as they practice math strategies and apply problem solving strategies. (whole group or small group instruction)

Teacher and students practice mathematics processes together through interactive activities, problem solving, and discussion. (whole group or small group instruction)

Students practice math strategies independently to build procedural and computational fluency. Teacher assesses learning and reteaches as necessary. (whole group instruction, small group instruction, or centers)
## Effective Pedagogical Routines/Instructional Strategies

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<tr>
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<th>Analyze Student Work</th>
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<tr>
<td>Connect Previous Knowledge to New Learning</td>
<td>Identify Student’s Mathematical Understanding</td>
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<tr>
<td>Making Thinking Visible</td>
<td>Identify Student’s Mathematical Misunderstandings</td>
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<tr>
<td>Develop and Demonstrate Mathematical Practices</td>
<td>Interviews</td>
</tr>
<tr>
<td>Inquiry-Oriented and Exploratory Approach</td>
<td>Role Playing</td>
</tr>
<tr>
<td>Multiple Solution Paths and Strategies</td>
<td>Diagrams, Charts, Tables, and Graphs</td>
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<tr>
<td>Use of Multiple Representations</td>
<td>Anticipate Likely and Possible Student Responses</td>
</tr>
<tr>
<td>Explain the Rationale of your Math Work</td>
<td>Collect Different Student Approaches</td>
</tr>
<tr>
<td>Quick Writes</td>
<td>Multiple Response Strategies</td>
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<tr>
<td>Pair/Trio Sharing</td>
<td>Asking Assessing and Advancing Questions</td>
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<tr>
<td>Turn and Talk</td>
<td>Revoicing</td>
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<td>Charting</td>
<td>Marking</td>
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<tr>
<td>Gallery Walks</td>
<td>Recapping</td>
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<td>Small Group and Whole Class Discussions</td>
<td>Challenging</td>
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<tr>
<td>Student Modeling</td>
<td>Pressing for Accuracy and Reasoning</td>
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<td></td>
<td>Maintain the Cognitive Demand</td>
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</tbody>
</table>
## Educational Technology

### Standards

<table>
<thead>
<tr>
<th>8.1.2.A.4, 8.1.2.E.1, 8.2.2.A.2, 8.2.2.A.3, 8.2.2.C.1, 8.2.2.E.3</th>
</tr>
</thead>
</table>

#### Technology Operations and Concepts
- **Demonstrate developmentally appropriate navigation skills in virtual environments** (i.e. games, museums).
  
  **Example:** Students will navigate websites such as Imagine Math Facts, MobyMax, SplashMath, Extramath, Learnzillion, Khan Academy.

#### Research and Information Fluency
- **Use digital tools and online resources to explore a problem or issue.**
  
  **Example:** Students will access on-line interactive resources, such as number lines and base ten blocks, to solve addition and subtraction problems within 10.
  
  https://www.mathlearningcenter.org/resources/apps  
  http://nlvm.usu.edu/en/nav/grade_g_1.html

#### The Nature of Technology: Creativity and Innovation
- **Describe how designed products and systems are useful at school, home, and work.**
  
  **Example:** Students will explain how tools such as ten frames, number lines, and part-part-whole mats are useful.

- **Identify a system and the components that work together to accomplish its purpose.**
  
  **Example:** Students will explain how ten frames, number lines, and part-part-whole mats represent how to find a solution to a problem.

#### Design
- **Brainstorm ideas on how to solve a problem or build a product.**
  
  **Example:** Students will work together to create drawings or equations to represent and solve addition word problems with three addends.

#### Computational Thinking: Programming
- **Create algorithms (a sets of instructions) using a pre-defined set of commands (e.g., to move a student or a character through a maze).**
  
  **Example:** Students will create a set of instructions explaining why addition or subtraction equations within 10 are true or false.

Link: [http://www.state.nj.us/education/cccs/2014/tech/](http://www.state.nj.us/education/cccs/2014/tech/)
# Career Ready Practices

Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

- **CRP2. Apply appropriate academic and technical skills.**
  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.

  **Example:** Students will apply prior knowledge when solving real world problems. Students will make sound judgments about the use of specific tools, such as ten frames, number lines, part-part-whole mats, or base ten blocks. Students choose appropriate tools to explore and deepen understanding of addition and subtraction concepts.

- **CRP4. Communicate clearly and effectively and with reason.**
  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.

  **Example:** Students will communicate precisely using clear definitions and provide carefully formulated explanations when constructing arguments. Students will communicate and defend mathematical reasoning using objects, drawings, diagrams, and/or actions. Students will ask probing questions to clarify or improve arguments.
Career Ready Practices

- **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**
  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.

  **Example:** Students will understand the meaning of a problem and look for entry points to its solution. They will analyze information, make conjectures, and plan a solution pathway to solve one and two step word problems involving addition or subtraction. Students will monitor and evaluate progress and change course as necessary.

- **CRP12. Work productively in teams while using cultural global competence.**
  Career-ready individuals positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.

  **Example:** Students will work collaboratively in groups to solve mathematical tasks. Students will listen to or read the arguments of others and ask probing questions to clarify or improve arguments. They will be able to explain why strategies based on place value and properties of operations work.
### WIDA Proficiency Levels

At the given level of English language proficiency, English language learners will process, understand, produce or use:

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
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</table>
| 6- Reaching | - Specialized or technical language reflective of the content areas at grade level  
- A variety of sentence lengths of varying linguistic complexity in extended oral or written discourse as required by the specified grade level  
- Oral or written communication in English comparable to proficient English peers |
| 5- Bridging | - Specialized or technical language of the content areas  
- A variety of sentence lengths of varying linguistic complexity in extended oral or written discourse, including stories, essays or reports  
- Oral or written language approaching comparability to that of proficient English peers when presented with grade level material. |
| 4- Expanding | - Specific and some technical language of the content areas  
- A variety of sentence lengths of varying linguistic complexity in oral discourse or multiple, related sentences or paragraphs  
- Oral or written language with minimal phonological, syntactic or semantic errors that may impede the communication, but retain much of its meaning, when presented with oral or written connected discourse, with sensory, graphic or interactive support |
| 3- Developing | - General and some specific language of the content areas  
- Expanded sentences in oral interaction or written paragraphs  
- Oral or written language with phonological, syntactic or semantic errors that may impede the communication, but retain much of its meaning, when presented with oral or written, narrative or expository descriptions with sensory, graphic or interactive support |
| 2- Beginning | - General language related to the content area  
- Phrases or short sentences  
- Oral or written language with phonological, syntactic, or semantic errors that often impede of the communication when presented with one to multiple-step commands, directions, or a series of statements with sensory, graphic or interactive support |
| 1- Entering | - Pictorial or graphic representation of the language of the content areas  
- Words, phrases or chunks of language when presented with one-step commands directions, WH-, choice or yes/no questions, or statements with sensory, graphic or interactive support |
### Language Development Supports for English Language Learners To Increase Comprehension and Communication Skills

#### Environment
- Welcoming and stress-free
- Respectful of linguistic and cultural diversity
- Honors students’ background knowledge
- Sets clear and high expectations
- Includes routines and norms
- Is thinking-focused vs. answer-seeking
- Offers multiple modalities to engage in content learning and to demonstrate understanding
- Includes explicit instruction of specific language targets
- Provides participation techniques to include all learners
- Integrates learning centers and games in a meaningful way
- Provides opportunities to practice and refine receptive and productive skills in English as a new language
- Integrates meaning and purposeful tasks/activities that:
  - Are accessible by all students through multiple entry points
  - Are relevant to students’ lives and cultural experiences
  - Build on prior mathematical learning
  - Demonstrate high cognitive demand
  - Offer multiple strategies for solutions
  - Allow for a language learning experience in addition to content

#### Sensory Supports*
- Real-life objects (realia) or concrete objects
- Physical models
- Manipulatives
- Pictures & photographs
- Visual representations or models such as diagrams or drawings
- Videos & films
- Newspapers or magazines
- Gestures
- Physical movements
- Music & songs

#### Graphic Supports*
- Graphs
- Charts
- Timelines
- Number lines
- Graphic organizers
- Graphing paper

#### Interactive Supports*
- In a whole group
- In a small group
- With a partner such as Turn-and-Talk
- In pairs as a group (first, two pairs work independently, then they form a group of four)
- In triads
- Cooperative learning structures such as Think-Pair-Share
- Interactive websites or software
- With a mentor or coach

#### Verbal and Textual Supports
- Labeling
- Students’ native language
- Modeling
- Repetitions
- Paraphrasing
- Summarizing
- Guiding questions
- Clarifying questions
- Probing questions
- Leveled questions such as What? When? Where? How? Why?
- Questioning prompts & cues
- Word Banks
- Sentence starters
- Sentence frames
- Discussion frames
- Talk moves, including Wait Time

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BUILDING EQUITY IN YOUR TEACHING PRACTICE

How do the essential questions highlight the connection between the big ideas of the unit and equity in your teaching practice?

**CONTENT INTEGRATION**
Teachers use examples and content from a variety of cultures & groups.

This unit / lesson is connected to other topics explored with students.

There are multiple viewpoints reflected in the content of this unit / lesson.

The materials and resources are reflective of the diverse identities and experiences of students.

The content affirms students, as well as exposes them to experiences other than their own.

**KNOWLEDGE CONSTRUCTION**
Teachers help students understand how knowledge is created and influenced by cultural assumptions, perspectives & biases.

This unit / lesson provides context to the history of privilege and oppression.

This unit / lesson addresses power relationships.

This unit / lesson help students to develop research and critical thinking skills.

This curriculum creates windows and mirrors* for students.

**PREJUDICE REDUCTION**
Teachers implement lessons and activities to assert positive images of ethnic groups & improve intergroup relations.

This unit / lesson help students question and unpack biases & stereotypes.

This unit / lesson help students examine, research and question information and sources.

The curriculum encourage discussion and understanding about the groups of people being represented.

This unit / lesson challenges dominant perspectives.

**EQUITABLE PEDAGOGY**
Teachers modify techniques and methods to facilitate the academic achievement of students from diverse backgrounds.

The instruction has been modified to meet the needs of each student.

Students feel respected and their cultural identities are valued.

Additional supports have been provided for students to become successful and independent learners.

Opportunities are provided for students to reflect on their learning and provide feedback.

**EMPOWERING SCHOOL CULTURE**
Using the other four dimensions to create a safe and healthy educational environment for all.

There are opportunities for students to connect with the community.

My classroom is welcoming and supportive for all students?

I am aware of and sensitive to the needs of my students and their families.

There are effective parent communication systems established.

Parents can talk to me about issues as they arise in my classroom.

**Culturally Relevant Pedagogy Examples**

- **Integrate Relevant Word Problems:** Contextualize equations using word problems that reference student interests and cultures.  
  *Example:* Create and use word problems that include student interests, current events, and/or relevance to real-world situations in order to make problems relatable to students when adding to, taking from, putting together, taking apart, and comparing. Using content that students can relate to adds meaning, value, and connection.

- **Use Learning Stations:** Provide a range of material by setting up learning stations.  
  *Example:* Reinforce understanding of concepts and skills by promoting learning through student interests and modalities, experiences and/or prior knowledge. Encourage the students to make choices in content based upon their strengths, needs, values and experiences. Providing students with choice boards will give them a sense of ownership to their learning and understanding.

- **Present New Concepts Using Student Vocabulary:** Use student diction to capture attention and build understanding before using academic terms.  
  *Example:* Teach math vocabulary in various modalities for students to remember. Use multi-modal activities, analogies, realia, visual cues, graphic representations, gestures, pictures, practice and cognates. Model to students that some vocabulary has multiple meanings. Have students create the Word Wall with their definitions and examples to foster ownership. Work with students to create a variety of sorting and match games of vocabulary words in this unit. Students can work in teams or individually to play these games for approximately 10-15 minutes each week. This will give students a different way of becoming familiar with the vocabulary rather than just looking up the words or writing the definition down.

- **Everyone has a Voice:** Create a classroom environment where students know that their contributions are expected and valued.  
  *Example:* Norms for sharing are established that communicate a growth mindset for mathematics. All students are capable of expressing mathematical thinking and contributing to the classroom community. Students learn new ways of looking at problem solving by working with and listening to each other.
Differentiated Instruction

Accommodate Based on Students Individual Needs: Strategies

<table>
<thead>
<tr>
<th>Time/General</th>
<th>Processing</th>
<th>Comprehension</th>
<th>Recall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra time for assigned tasks</td>
<td>Extra Response time</td>
<td>Precise processes for balanced math instructional model</td>
<td>Teacher-made checklist</td>
</tr>
<tr>
<td>Adjust length of assignment</td>
<td>Have students verbalize steps</td>
<td>Short manageable tasks</td>
<td>Use visual graphic organizers</td>
</tr>
<tr>
<td>Timeline with due dates for reports and projects</td>
<td>Repeat, clarify or reword directions</td>
<td>Brief and concrete directions</td>
<td>Reference resources to promote independence</td>
</tr>
<tr>
<td>Communication system between home and school</td>
<td>Mini-breaks between tasks</td>
<td>Provide immediate feedback</td>
<td>Visual and verbal reminders</td>
</tr>
<tr>
<td>Provide lecture notes/outline</td>
<td>Provide a warning for transitions</td>
<td>Small group instruction</td>
<td>Graphic organizers</td>
</tr>
<tr>
<td></td>
<td>Partnering</td>
<td>Emphasize multi-sensory learning</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assistive Technology</th>
<th>Tests/Quizzes/Grading</th>
<th>Behavior/Attention</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer/whiteboard</td>
<td>Extended time</td>
<td>Consistent daily structured routine</td>
<td>Individual daily planner</td>
</tr>
<tr>
<td>Tape recorder</td>
<td>Study guides</td>
<td>Simple and clear classroom rules</td>
<td>Display a written agenda</td>
</tr>
<tr>
<td>Video Tape</td>
<td>Shortened tests</td>
<td>Frequent feedback</td>
<td>Note-taking assistance</td>
</tr>
<tr>
<td></td>
<td>Read directions aloud</td>
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<td>Color code materials</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Recall</th>
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<tbody>
<tr>
<td>Teacher-made checklist</td>
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<td></td>
<td>Graphic organizers</td>
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</tbody>
</table>
**Differentiated Instruction**

**Accommodate Based on Content Specific Needs:**

- Teacher modeling
- Review pre-requisite skills and mental math strategies. These strategies may include review of using doubles, doubles plus one, number partners for 10, counting on, counting back, and place value.
- Use drawings to represent problems involving addition and subtraction.
- Use manipulatives such as counters, color tiles, unifix cubes or base ten blocks to assist in solving addition or subtraction problems and understanding place value.
- Use hundred chart, ten frames, number lines, part-part-whole mat for addition and subtraction.
- Use hundred chart to assist with counting and reading numerals to 100.
- Chart academic vocabulary with visual representations.
Interdisciplinary Connections

*Model interdisciplinary thinking to expose students to other disciplines.*

**Social Studies Connection:**
*Halloween Candy*  Social Studies Standards 6.1.4.A.14; 6.1.4.D.12
- A brief history about Halloween in ancient as well as modern times at:

**Apple Picking Time:**  Social Studies Standard 6.1.4.C.14
- A site full of activities relating to apples at:
  [https://www.eduplace.com/monthlytheme/september/apples.html](https://www.eduplace.com/monthlytheme/september/apples.html)

**Science Connection:**
*The Very Hungry Caterpillar*: Science Standard 1-LS3-1
- After reading the story to the class, open a discussion around science to explore what happened to the caterpillar. – See more at:

*Farm Animals*  Science Standard 1-LS3-1
- Visit Kids' Farm to learn how taking care of animals takes time, dedication, and knowledge at:
  [https://nationalzoo.si.edu/animals/exhibits/kids-farm](https://nationalzoo.si.edu/animals/exhibits/kids-farm)

**ELA Connection:**  Language Arts Standard RL.1.1
*Two of Everything:*
- Read: *Two of Everything* by Lily Toy Hung  [https://www.youtube.com/watch?v=TY_NP528ph4](https://www.youtube.com/watch?v=TY_NP528ph4)

*The Very Hungry Caterpillar:*
- Read: *The Very Hungry Caterpillar* by Eric Carle  [https://www.youtube.com/watch?v=PbLPMjxUXmI](https://www.youtube.com/watch?v=PbLPMjxUXmI)

*Farm Animals:*
- Read an online book about Life in A Farm at:  [https://www.ezschool.com/stories/FarmLife.html](https://www.ezschool.com/stories/FarmLife.html)

*Tens and Ones with the Three Little Pigs*
- Watch a video read aloud of The Three Little Pigs at:  [https://www.youtube.com/watch?v=1WjHqT8dgeQ](https://www.youtube.com/watch?v=1WjHqT8dgeQ)
### Interdisciplinary Connections

**Possible Read Alouds:**

- *Two of Everything* by Lily Toy Hung  [https://www.youtube.com/watch?v=TY_NP528ph4](https://www.youtube.com/watch?v=TY_NP528ph4)
- *The Very Hungry Caterpillar* by Eric Carle  [https://www.youtube.com/watch?v=PbLPMjxUXmI](https://www.youtube.com/watch?v=PbLPMjxUXmI)
- *One Too Many* by Gianna Morino
- *Who Stole the Cookie from the Cookie Jar?*
- *Two Ways to Count to 10* by Ruby Dee
- *The Doorbell Rang* by Pat Hutchins  [https://www.youtube.com/watch?v=ESHLF92_rBw](https://www.youtube.com/watch?v=ESHLF92_rBw)
# Enrichment

## What is the purpose of Enrichment?

- The purpose of enrichment is to provide extended learning opportunities and challenges to students who have already mastered, or can quickly master, the basic curriculum. Enrichment gives the student more time to study concepts with greater depth, breadth, and complexity.
- Enrichment also provides opportunities for students to pursue learning in their own areas of interest and strengths.
- Enrichment keeps advanced students engaged and supports their accelerated academic needs.
- Enrichment provides the most appropriate answer to the question, “What do you do when the student already knows it?”

## Enrichment is…

- Planned and purposeful
- *Different*, or differentiated, work – not just *more* work
- Responsive to students’ needs and situations
- A promotion of high-level thinking skills and making connections within content
- The ability to apply different or multiple strategies to the content
- The ability to synthesize concepts and make real world and cross-curricular connections
- Elevated contextual complexity
- Sometimes independent activities, sometimes direct instruction
- Inquiry based or open ended assignments and projects
- Using supplementary materials in addition to the normal range of resources
- Choices for students
- Tiered/Multi-level activities with flexible groups (may change daily or weekly)

## Enrichment is not…

- Just for gifted students (some gifted students may need intervention in some areas just as some other students may need frequent enrichment)
- Worksheets that are more of the same (busywork)
- Random assignments, games, or puzzles not connected to the content areas or areas of student interest
- Extra homework
- A package that is the same for everyone
- Thinking skills taught in isolation
- Unstructured free time
Assessments

Required District/State Assessments
Unit Assessments
SGO Assessments

Suggested Formative/Summative Classroom Assessments
Describe Learning Vertically
Identify Key Building Blocks
Make Connections (between and among key building blocks)
Short/Extended Constructed Response Items
Multiple-Choice Items (where multiple answer choices may be correct)
Drag and Drop Items
Use of Equation Editor
Quizzes
Journal Entries/Reflections/Quick-Writes
Accountable talk
Projects
Portfolio
Observation
Graphic Organizers/Concept Mapping
Presentations
Role Playing
Teacher-Student and Student-Student Conferencing
Homework
Running Records
<table>
<thead>
<tr>
<th>New Jersey Student Learning Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.OA.A.1</strong> 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. <em>(benchmarked)</em></td>
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<tr>
<td><strong>1.OA.A.2</strong> 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.</td>
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<tr>
<td><strong>1.OA.B.3</strong> Apply properties of operations as strategies to add and subtract. Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$. (Associative property of addition.) <em>(Students need not use formal terms for these properties.)</em> <em>(benchmarked)</em></td>
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<tr>
<td><strong>1.OA.B.4</strong> Understand subtraction as an unknown-addend problem. <em>For example, subtract $10 - 8$ by finding the number that makes 10 when added to 8.</em></td>
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<td><strong>1.OA.C.5</strong> Relate counting to addition and subtraction (e.g., by counting 2 to add 2).</td>
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<tr>
<td><strong>1.OA.D.7</strong> Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. <em>For example, which of the following equations are true and which are false? $6 = 6$, $7 = 8 - 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$.</em></td>
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<tr>
<td><strong>1.OA.D.8</strong> Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations. $8 + ? = 11$, $5 = _ - 3$, $6 + 6 = _$. <em>(benchmarked)</em></td>
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<tr>
<td><strong>1.NBT.A.1</strong> 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 <em>(benchmarked)</em></td>
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</table>
Mathematical Practices

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

2. Reason abstractly and quantitatively.

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

4. Model with mathematics.

5. Use appropriate tools strategically.

6. Attend to precision.

7. Look for and make use of structure.

8. Look for and express regularity in repeated reasoning.
<table>
<thead>
<tr>
<th>Grade: One</th>
<th>Unit: 1 (One)</th>
<th>Topic: Add and Subtract within 10</th>
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</thead>
</table>

**NJSLS:**
1.OA.A.1, 1.OA.A.2, 1.OA.B.3, 1.OA.B.4, 1.OA.C.5, 1.OA.D.7, 1.OA.D.8, 1.NBT.A.1

**Unit Focus:**
- Represent and solve problems involving addition and subtraction
- Understand and apply properties of operations and the relationship between addition and subtraction
- Add and subtract within 10
- Work with addition and subtraction equations
- Extend the counting sequence

**New Jersey Student Learning Standard(s):**

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. *(benchmarked)*

**Student Learning Objective 1:** Use addition and subtraction within 10 to solve problems, including word problems involving situations of adding to, taking from, putting together, taking apart, and comparing with unknowns in all positions.

**Modified Student Learning Objectives/Standards:**

M.EE.1.OA.A.1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), or acting out situations.

<table>
<thead>
<tr>
<th>MPs</th>
<th>Evidence Statement Key/Clarifications</th>
<th>Skills, Strategies &amp; Concepts</th>
<th>Essential Understandings/Questions (Accountable Talk)</th>
<th>Tasks/Activities</th>
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</thead>
<tbody>
<tr>
<td>MP 1</td>
<td>1.OA.A.1</td>
<td>Students should represent problems in multiple ways including drawings and or objects/manipulatives (e.g., counters, unifix cubes, number lines).</td>
<td>Subtraction has an inverse relationship with addition.</td>
<td>IFL Task(s) “Solving for Unknowns in all Positions” (IFL Unit only addresses “adding to”)</td>
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<td>MP 2</td>
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<td>Many different problem situations can be represented by part-part-</td>
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<td>MP 3</td>
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<td>MP 4</td>
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<td>MP 5</td>
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<td>MP 8</td>
<td>Mastery is expected in “Add To” and “Take From” - Result and Change Unknown Problems, “Put Together/Take Apart” Problems, “Compare” - Difference Unknown, Bigger Unknown (more version) and Smaller Unknown (fewer version) Problems (for more information see CCSS Table 1, p. 88 and OA Progression, p. 9.)</td>
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<td>Interviews (individual or small group) are used to assess mastery of different problem types</td>
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<td>Part-part-whole relationships show how two numbers (the parts) are related to a third number (the whole).</td>
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<td>“Add to” and “Take From” problem type situations involve actions. “Adding to” problems involve increasing by joining, while “taking from” problems involve decreasing or separating. Each of these situations can be further categorized by considering what information must be found (the result of the action, the change, or the start).</td>
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<td>Other problem situations do not change the amounts in any set; these “no action” situations may involve putting together collections of objects, taking apart a collection of objects, or comparing two collections of objects.</td>
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<td>Understanding the relationship between addition and subtraction reduces the number of facts that students must “know” by giving them a consistent, reliable strategy for subtraction: use the related addition fact. These related facts then form fact families.</td>
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<td>The symbol (unknown) can be in any position.</td>
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<td>whole relationships using addition or subtraction.</td>
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<td>Part-part-whole relationships can be expressed by using number sentences like ( a + b = c ) or ( c - b = a ), where ( a ) and ( b ) are the parts and ( c ) is the whole.</td>
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<td>Mathematical operations are used in solving problems in which a new value is produced from one or more values.</td>
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<td><strong>Conservation:</strong> A quantity in a set can be moved to the other set and the sets can be combined, but the whole amount remains the same because no additional items were added or taken away (ex. ( 9 + 6 = 10 + 5 )).</td>
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<td>How can we represent a number using tens and ones?</td>
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<td>How can we represent a number in a variety of ways?</td>
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<td>How does using 10 as a benchmark help us compose numbers or add/subtract?</td>
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<td>Additional Tasks:</td>
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<tr>
<td>Apple Picking Time</td>
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<td>Number Combinations to 5</td>
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<td>Halloween Buckets</td>
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<td>Bunk Bed Problem</td>
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<td>Double-Decker Bus Problem</td>
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<td>Making Apple Ten Packs</td>
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<td>Grapes OA.1</td>
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<td>Cats OA.1</td>
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<td>Addends Repositioned Lesson 19</td>
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<td>1.OA.A.1 Sharing Markers</td>
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<td>The Very Hungry Caterpillar</td>
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<td>Two of Everything</td>
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<tr>
<td>1.OA.1 (Four Lessons)</td>
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</table>
Students should be able to take apart and combine numbers in a wide variety of ways.

Students also need to make sense of quantity and be able to compare numbers.

Students must solve a variety of addition and subtraction word problems. To add, students should be able to solve for any unknown position in a problem. (Unknown can be one of the addends or the result/sum. Situational problems should have a variety of change unknown, whole unknown, and start unknown.)

Students need to be exposed to a variety of strategies that will allow them to group addends many different ways to make the addition process easier. For instance, students should be guided to look for places where they can “make 10” before adding, “doubles”, “doubles +1”, or “doubles -1”.

When students are comfortable with adding three addends, begin to introduce an unknown in the numeric sentence. From here, students can use their knowledge of related addition

| How can you solve a subtraction fact by thinking about a related addition fact? |
| What strategies can you use to help me demonstrate fluency for addition and subtraction facts up to 10? |
| What strategies can you use to solve addition word problems? |
| How can different strategies be helpful when solving a problem? |
| What strategies can be used to solve story problems with an unknown addend? |
| Problems can be solved by counting all, counting on from a quantity, counting on from the largest set, or using derived facts when solving for the whole amount or the missing part of the whole. |
| Mapping devices (part-part-whole mat, number bonds) can help you gain a sense of the quantities involved, to notice increases and decreases, and consider the doing and undoing related to addition and subtraction. |

(Some tasks extend beyond 20.)
and subtraction facts to solve for the unknown.

Provide students with multiple opportunities to discuss their reasoning for the method they chose for their problem-solving.

Students make note of increasing/decreasing, doing and undoing as it relates to addition and subtraction.

Use the part-part-whole mat to respond to situational problems. For example, start with context and ask students to construct a model or use the part-part-whole mat to show the part-part-whole relationship and write equations.

Utilize subtraction to solve missing addend problems.

**Doubles**
Adding two of the same number together such as 2+2=4 or 5+5=10.

**Doubles Plus One**
Example: When adding 6 + 7 these are the steps to think through:
* Double the lower number, which in this case would give you 6 + 6 =12.
* Now add one: (The second 6 was a 7, remember?)
* Think $6 + 6 + 1 = 13$ or $12 + 1 = 13$.
* Now say the fact: $6 + 7 = 13$

**Doubles Minus One**
Example: When adding $7+8$ these are the steps to think through:
*Double the higher number, which in this case would give you $8+8=16$.
*Now subtract one: $16-1=15$.
*Think $(8+8)-1=15$ or $16-1=15$.
*Now say the fact: $7+8=15$.

**SPED Strategies:**
Provide manipulatives, such as counters or unifix cubes.

Pose word problems as warm-ups.

Teacher modeling, student modeling.

Students write and illustrate their own story word problem.

Provide anchor charts for students as a reference.

Students use objects or drawings to represent the different situations.

**Example:**
Abel has 9 balls. He gave 3 to Susan. How many balls does Abel have now? Students start with 9 counters and give 3 away.
### Compare example:
Abel has 9 balls. Susan has 3 balls. How many more balls does Abel have than Susan? A student will use 9 objects to represent Abel’s 9 balls and 3 objects to represent Susan’s 3 balls. Then they will compare the 2 sets of objects.
- Note that even though the modeling of the two problems above is different, the equation, $9 - 3 = ?$, can represent both situations. Also, the compare example can be represented by $3 + ? = 9$ (How many more do I need to make 9?).

### ELL Strategies:
Introduce and chart academic vocabulary with visuals: add, addition fact, sum, subtract, subtraction fact, difference, related facts, compare.

Draw pictures to depict the action of the problem to demonstrate understanding of math problems read orally. Then students explain orally the solution by drawing the solutions and using selected technical words, and/or phrases and/or simple sentences.
Utilize the fact family triangles or connecting cubes to solve word problems read orally.

**New Jersey Student Learning Standard(s):**
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. *(benchmarked)*

**Student Learning Objective 2:** Solve addition word problems with three whole numbers with sums less than or equal to 20.

**Modified Student Learning Objectives/Standards:**
M.EE.1.OA.A.2 Use “putting together” to solve problems with two sets.

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>MP 1</td>
<td>1.OA.A.2</td>
<td>Students solve multi-step word problems by adding (joining) three numbers whose sum is less than or equal to 20, using a variety of mathematical representations. <strong>Example:</strong> Mrs. Jones has 4 chocolate chip cookies, 5 oatmeal cookies, and 6 gingerbread cookies. How many cookies does Mrs. Jones have? Students should be able to add numbers in any order and identify the most efficient way to solve the problem. Students need practice with a variety of strategies that will allow them to group</td>
<td>Can students group addends in different ways to assist them when adding 3 addends together? Place value concepts provide a convenient way to compose and decompose numbers to facilitate addition computations. How can the use of manipulatives, and other visual or concrete aids, help students with their understanding of adding three addends?</td>
<td>IFL Task(s) “Solving for Unknowns in all Positions” (IFL Unit only addresses “adding to”) <strong>Additional Tasks:</strong> Farm Animals Lemonade Stand Find 3 Cards Three Letter Addends</td>
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<tr>
<td>MP 2</td>
<td>Interviews (individual or small group) should target students’ ability to solve word problems with 3 addends.</td>
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<td>MP 3</td>
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<td>MP 4</td>
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<td>MP 5</td>
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<td>MP 8</td>
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</table>
addends in different ways to make the addition process easier. For instance, students should be guided to look for places where they can "make 10", "doubles", "doubles +1" and "doubles -1" before adding.

When students are comfortable with adding three addends, begin to introduce an unknown portion in the numeric sentence. From here, students can use their knowledge of related addition and subtraction facts to solve for the unknown portion.

The use of manipulatives (such as counters or unifix cubes), pictures, models, and technologies should be incorporated into the learning experience for greater understanding.

Provide students with multiple opportunities to discuss their reasoning for the method they chose for their problem-solving.

**SPED Strategies:**
Use properties of operations and different strategies to find the sum of three whole numbers.

Counting on and counting on again (e.g., to add 3 + 2 + 4 a student writes 3 + 2 + 4

Can students employ their knowledge of related addition and subtraction facts when solving for an unknown portion?

Can students solve problems with three addends when presented in the context of word problems?

A quantity in a set can be moved to the other set and the sets can be combined, but the whole amount remains the same because no additional items were added or taken away (ex. 9+6 = 10+5).

Mapping devices (part-part-whole map) can help you gain a sense of the quantities involved, to notice increases and decreases, and consider the doing and undoing related to addition and subtraction.

Problems can be solved by counting all, counting on from a quantity, counting on from the largest set, or using derived facts when solving for the
and thinks, “3, 4, 5, that’s 2 more, 6, 7, 8, 9 that’s 4 more so 3 + 2 + 4 = 9.”

Making tens (e.g., 4 + 8 + 6 = 4 + 6 + 8 = 10 + 8 = 18)

**ELL Strategies:**
Introduce and chart academic vocabulary with visuals: addend, sum, altogether.

Draw/model the solution to addition word problems involving three numbers using selected technical words, phrases or simple sentences.

Students work in small groups and use connecting cubes to solve addition word problems.

Visuals may be provided to help the student better understand the word problem.

whole amount or the missing part of the whole.

What strategies can be used to solve story problems with an unknown addend?
New Jersey Student Learning Standard(s):
1.OA.B.3: Apply properties of operations as strategies to add and subtract. Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$. (Associative property of addition) (Students need not use formal terms for these properties.) *(benchmarked)*

Student Learning Objective 3: Apply properties of operations (commutative property) as strategies to add or subtract within 10.

Modified Student Learning Objectives/Standards: N/A

<table>
<thead>
<tr>
<th>MPs</th>
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</thead>
<tbody>
<tr>
<td>MP 2</td>
<td>1.OA.B.3</td>
<td>Students must understand the concept of fact families.</td>
<td>The commutative property for addition of whole numbers allow computations to be performed flexibly.</td>
<td>IFL Task(s) “Solving for Unknowns in all Positions” (IFL Unit only addresses “adding to”)</td>
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<tr>
<td>MP 7</td>
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<td>Students do not need to know the specific names of properties; however, practice in using the processes within those properties will benefit their learning in later grade levels. For example, if $7+3=10$ is known, then $3+7=10$ is also known. (Commutative property of addition.) Students need to know that when adding the numbers need not be added in any particular order. Use red/yellow counters on a ten frame to show how the order of addends can be switched but the total stays the same.</td>
<td>Subtraction is not commutative for whole numbers. Can students explain that addition and subtraction are related, in that there are “families” of facts? Can students utilize a variety of strategies to find sums and differences? Can students communicate the reasoning behind the strategies they used in computing sums and differences?</td>
<td>Additional Tasks:</td>
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<tr>
<td>MP 8</td>
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<td>Oranges Task OA.3</td>
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<td>Trains Task OA.3</td>
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<td>Turn Around Trains</td>
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<td>Turn Around Dominoes</td>
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<td>Domino Addition</td>
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<td>Domino Fact Family</td>
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<td>Use dominoes to show commutative property.</td>
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<tr>
<td><strong>SPED Strategies:</strong></td>
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<td>Explain orally and in writing the properties of operations to find sums or differences within 10 using two-colored connecting cubes or counters.</td>
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<td>Provide manipulatives for students to utilize.</td>
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<tr>
<td>Teacher modeling.</td>
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<tr>
<td>Show instructional videos.</td>
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<tr>
<td><strong>ELL Strategies:</strong></td>
<td></td>
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</tr>
<tr>
<td>Introduce and chart academic vocabulary with visuals: sum, difference, add, subtract.</td>
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<tr>
<td>Explain orally and in writing the properties of operations to find sums or differences within 10 using two-colored connecting cubes or counters.</td>
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<tr>
<td>Use key vocabulary in a series of simple sentences to explain orally and in writing the properties of operations to find sums or differences within 10.</td>
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<tr>
<td>Students maintain a math journal to demonstrate growth in math writing and reasoning.</td>
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</tbody>
</table>

In addition, two quantities can be combined in any order and the whole quantity will remain the same. (Commutative Property of Addition; 4+5=5+4).

<table>
<thead>
<tr>
<th><strong>Commutative Add</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Commutative Number Line</strong></td>
</tr>
<tr>
<td><strong>1.OA.B.3 Domino Addition</strong></td>
</tr>
<tr>
<td>(Some tasks extend beyond 20.)</td>
</tr>
</tbody>
</table>
New Jersey Student Learning Standard(s): 
1.OA.B.4: Understand subtraction as an unknown-addend problem. *For example, subtract 10 - 8 by finding the number that makes 10 when added to 8. *(benchmarked)

Student Learning Objective 4: Solve subtraction problems, **within 10**, by representing subtraction as an unknown addend problem and finding the unknown addend.

Modified Student Learning Objectives/Standards: N/A

<table>
<thead>
<tr>
<th>MPs</th>
<th>Evidence Statement Key/Clarifications</th>
<th>Skills, Strategies &amp; Concepts</th>
<th>Essential Understandings/Questions (Accountable Talk)</th>
<th>Tasks/Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP 2</td>
<td>N/A</td>
<td>Students need to recognize the importance of knowing that addition and subtraction are related to one another.</td>
<td>Subtraction is not commutative or associative for whole numbers.</td>
<td>IFL Task(s) “Solving for Unknowns in all Positions” (IFL Unit only addresses “adding to”)</td>
</tr>
<tr>
<td>MP 7</td>
<td></td>
<td>Solving for unknown portions in a number sentence is a foundational skill for later algebra studies.</td>
<td>Are students able to use an addition sentence when solving for the difference in a subtraction problem?</td>
<td>Additional Tasks:</td>
</tr>
<tr>
<td>MP 8</td>
<td></td>
<td>This standard refers specifically to the useful strategy to assist students in solving subtraction problems that involves using a related addition fact. Practice with this strategy will allow for more fluency between addition and subtraction.</td>
<td>Can students model a subtraction problem using manipulatives and pictorial representations to explain how to use a related addition fact to solve for the difference?</td>
<td>Zoo Story Task</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Understanding subtraction as an unknown addend situation.</td>
<td>Mapping devices (part-part-whole mat) and tools can help you gain a sense of the quantities involved, to notice increases and decreases, and consider the doing and undoing related to addition and subtraction.</td>
<td>Frogs Task</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>1.OA.4 Puppies In My Purse</td>
<td>Cookies Task</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td>Ten Frame Subtraction</td>
</tr>
</tbody>
</table>
Finding 9 minus 3 means solving \(? + 3 = 9\) or \(3 + ? = 9\) (fact families)

Teachers should ask students to model a subtraction problem using concrete objects.

**Example:**
“Use cubes to model \(7 - 4\).” The students will count out 7 cubes and then take away 4 of them. The teacher can ask students to set the 4 cubes to the side rather than removing them completely from the workspace. Draw students’ attention to the two parts they have made by separating the 4 from the rest. Ask students to put into words their response to \(7 - 4\). Ask for volunteers to explain how they know that \(7 - 4\) is 3. Then, ask students if they could write a different math sentence to represent their two piles of cubes (\(4 + 3 = 7\)). Ask strategic questions to guide students to explain how the two math sentences can name the same situation.

When first graders have had ample opportunities to work with tangible objects to represent real-world situations and have had repeated practice working with combinations of sums to 10, they will be able to.

Addition and subtraction are inverse operations because two or more quantities can come together and then the whole amount of objects can be taken apart, but the composition of the whole quantity remains the same. (doing and undoing, inverse operations; \(4 + 5 = 9, 9 - 5 = 4\))

1.OA.B.4 Lessons 33-34, 36-37

1.OA.B.4 Cave Game Subtraction

(Some tasks extend beyond 20.)
quickly recognize what number is needed to make a given sum and that this strategy can be used to solve related subtraction problems.

Use the part-part-whole mat to respond to situational problems.

Ask students to solve sets of addition equations, make “noticings” about things that are the same in the sets and then analyze examples of the relationships between missing addend equations and subtraction.

**SPED Strategies:**

Explain orally and in writing how to solve subtraction problems with unknown addends, using ten-frames and counters.

When determining the answer to a subtraction problem, 12 - 5, students think, “If I have 5, how many more do I need to make 12?” Encouraging students to record this symbolically, $5 + ? = 12$, will develop their understanding of the relationship between addition and subtraction. Some strategies they may use are counting objects, creating drawings, counting up, using number lines or ten frames to determine an answer.
**ELL Strategies:**
Introduce and chart academic vocabulary with visuals: addend, difference, unknown.

The teacher can use ten-frames and/or counters to model how to add how to add in order to find differences within 10.

Use sentence frames or sentence starters to model how to explain orally and in writing adding in order to solve subtraction problems with unknown addends using selected technical vocabulary in phrases and short sentences.

Students maintain a math journal to demonstrate growth in math writing and reasoning.
New Jersey Student Learning Standard(s):
1.OA.C.5 Relate counting to addition and subtraction (e.g., by counting 2 to add 2).

Student Learning Objective 5: Count on to add and count backwards to subtract to solve addition and subtraction problems within 20.

Modified Student Learning Objectives/Standards:
M.EE.1.OA.C.5 Use manipulatives or visual representations to indicate the number that results when adding one more. Apply knowledge of "one less" to subtract one from a number.

<table>
<thead>
<tr>
<th>MPs</th>
<th>Evidence Statement Key/Clarifications</th>
<th>Skills, Strategies &amp; Concepts</th>
<th>Essential Understandings/Questions (Accountable Talk)</th>
<th>Tasks/Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP 2</td>
<td>N/A</td>
<td>Mathematical operations are used in solving problems in which a new value is produced from one or more values. Counting can be used to add and subtract. Use number lines to count on or count back. When students are choosing, combining, and applying effective strategies for answering quantitative questions, they are using algebraic thinking. When solving addition and subtraction problems to 20, students often use counting strategies, such as counting all.</td>
<td>Situations that can be repeated by addition or subtraction can be considered as basic applications of counting forward or back. Students establish a one-to-one correspondence by moving, touching, or pointing to each object they are counting as they say the corresponding number words. Computation involves taking apart and combining numbers using a variety of approaches. Flexible methods of computation involve grouping numbers in strategic ways.</td>
<td>Eyes Fun in the Snow with Max and Ruby One More on the Ten Frame One More/One Less Show One Less Show One More Fact Families to 10</td>
</tr>
<tr>
<td>MP 7</td>
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<tr>
<td>counting on from the first number, counting on from the larger number and counting back, before fully developing the essential strategy of using 10 as a benchmark number.</td>
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<tr>
<td>Relating numbers to the benchmark quantities 5 and 10 helps students see the relative sizes of numbers and can therefore support their transition from counting to later work in addition and subtraction.</td>
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<tr>
<td>Once first graders have developed counting strategies to solve addition and subtraction problems it is important to move students toward strategies that focus on composing and decomposing numbers using ten as a benchmark number, especially since counting becomes difficult when working with larger numbers.</td>
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<tr>
<td>As students connect counting and number sequence to operations, they gain a better understanding of addition and subtraction.</td>
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</tbody>
</table>

Proficiency with basic facts aids estimation and computation of larger and smaller numbers.

In what ways can operations affect numbers?

How can different strategies be helpful when solving a problem?

Embedded Numbers and Decompositions OA.5 and OA.1

(Some tasks extend beyond 20.)
| **SPED Strategies:**  
Use ten-frames and manipulatives such as counters and connecting cubes.  
Help students to practice counting backwards from a starting number, saying the next two numbers as a whisper, then the third number loudly. A number line will help students to become more confident with counting forwards and backwards.  
Teacher modeling and concrete models should be provided for students. |
|---|
| **ELL Strategies:**  
Introduce and chart academic vocabulary with visuals: number words 0-20, add, subtract, sum, difference, plus, minus, equals, altogether.  
Use gestures with a number line or hundred chart, pictures, and selected illustrated single words to solve addition and subtraction problems by counting forward or backward.  
Use key vocabulary in phrases and short sentences with illustrations to solve addition and subtraction |
problems by counting forward or backward.

Students maintain a math journal to demonstrate growth in math writing and reasoning.

**New Jersey Student Learning Standard(s):**
1.OA.D.7: Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. *For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 - 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.* *(benchmarked)*

**Student Learning Objective 6:** Determine if addition and subtraction equations, within 10, are true or false.

**Modified Student Learning Objectives/Standards:** N/A

<table>
<thead>
<tr>
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<th>Essential Understandings/Questions (Accountable Talk)</th>
<th>Tasks/Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP 2</td>
<td>1.OA.D.7</td>
<td>Students need early exposure to the phrasing “the same as” when they are dealing with number problems that contain the equals sign. Use concrete objects to show the two sides of the equations and determine if the amount is the same. Use the terms “the same as” interchangeably with “is equal to”. Use the terms “not the same as” as well as “not equal to”.</td>
<td>Two or more expressions/equations are equivalent if they represent the same quantity. Can students model number sentences and show that quantities on both sides of an equal sign must be the same? Can students recognize when two sides of an equation (or two quantities) are not equal? Can students articulate with words and/or diagrams why two sides of an equation are not equal?</td>
<td>1.OA.7 True or False Task A 1.OA.7 True or False Task B Task 10a OA.7 Task 10b OA.7 Add and Subtract equations with equal sign OA.7</td>
</tr>
<tr>
<td>MP 3</td>
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<tr>
<td>MP 6</td>
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<tr>
<td>MP 7</td>
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</table>
The concept of a balance or a seesaw is a visual tool that assists students in understanding that the amounts on either side must be the same.

The use of models, drawings and objects is especially useful in helping students to visually see that the quantity on the left side of the equal sign is the same as the quantity on the right side. False equations should be presented to students to identify, as well. For example, $6 + 0 = 6 + 1$.

Example:

Which of the following equations are true and which are false?

- $6 = 6$
- $5 + 2 = 2 + 5$
- $7 = 8 - 1$
- $4 + 1 = 5 + 2$

**SPED Strategies:**

Write and orally count forward or backward from 0-20 to solve addition and subtraction problems using a word wall, number line, hundreds chart and illustrations/diagrams/drawings.

Two or more expressions/equations are equivalent if they represent the same quantity.

1.OA.7 Equation - True – False

1.OA.D.7 Equality Number Sentences

(Some tasks extend beyond 20.)
Interchanging the language of “equal to” and “the same as” as well as “not equal to” and “not the same as” will help students grasp the meaning of the equal sign.

Students should understand that “equality” means “the same quantity as”.

In order for students to avoid the common pitfall that the equal sign means “to do something” or that the equal sign means “the answer is,” they need to be able to:

- express their understanding of the meaning of the equal sign.
- know that the equal sign represents a relationship between two equal quantities.

Experiences determining if equations are true or false help students develop these skills. Initially, students develop an understanding of the meaning of equality using models. However, the goal is for students to reason at a more abstract level. At all times students should justify their answers, make conjectures (e.g., if you add a number and then subtract that same number, you always get zero), and make estimations.
### ELL Strategies:
Introduce and chart academic vocabulary with visuals: equal, equal sign, equation, not equal, true, false.

Teacher models (think aloud) how he/she determines if an equation is true or false using drawings and sorting them into a T-Chart.

Teacher models using key terms in short phrases and sentences to demonstrate understanding of equations.

### New Jersey Student Learning Standard(s):
1.OA.D.8: Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = _ - 3, 6 + 6 = _.* *(benchmarked)*

### Student Learning Objective 7:
Solve addition and subtraction equations, **within 10**, by finding the missing whole number in any position.

### Modified Student Learning Objectives/Standards: N/A

<table>
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<tr>
<th>MPs</th>
<th>Evidence Statement Key/Clarifications</th>
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<th>Essential Understandings/Questions (Accountable Talk)</th>
<th>Tasks/Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP 2 MP 6 MP 7</td>
<td>1.OA.D.8</td>
<td>Fact families are a good strategy in helping students to relate addition and subtraction to one another. Teachers should guide students to the understanding that if a student knows that $2 + 3 = 5$, then they can use that knowledge to solve $5 = ? + 2$.</td>
<td>Do students understand that addition and subtraction are related to one another? Can students reason and communicate how to solve for an unknown portion in a number sentence?</td>
<td>Unknown Numbers in Sums and Differences</td>
</tr>
</tbody>
</table>

- **Task 12a OA.8**
- **Task 12b OA.8**
| relating 3 whole numbers. Thinking strategies expected in Grade 1 (Level 2 and 3) are defined in 1.OA.6 and in OA Progression (p. 14-17.) | Helping students to master the process of using subtraction to find the missing addend as well as using addition to find the missing portion in a subtraction problem will assist in students’ ability to fluently solve these problems.

The use of manipulatives, technologies, models, and drawings can aid in helping students to visualize the unknown portion in an algebraic problem.

**SPED Strategies:**
Students need to understand the meaning of the equal sign and know that the quantity on one side of the equal sign must be the same quantity on the other side of the equal sign. They should be exposed to problems with the unknown in different positions.

Having students create word problems for given equations will help them make sense of the equation and develop strategic thinking.

**Examples of possible student “think-alouds”:**
- $8 + ? = 11$: “8 and some number is the same as 11. 8

| Can students explain the role the equal sign plays in algebraic equations in that they understand that both sides of the equal sign must have the same values? | Find the Missing Number OA.8
1.OA.D.8 Kiri's Mathematics Match Game
(Some tasks extend beyond 20.) |
and 2 is 10 and 1 more makes 11. So the answer is 3.”

- 5 = □ – 3: “This equation means I had some cookies and I ate 3 of them. Now I have 5. How many cookies did I have to start with? Since I have 5 left and I ate 3, I know I started with 8 because I count on from 5...6, 7, 8.”

Students may use a document camera or interactive whiteboard to display their combining or separating strategies for solving the equations.

**ELL Strategies:**
Introduce and chart academic vocabulary with visuals: equation, equal sign, missing, missing number.

Follow step-by-step oral directions for teacher modeling and manipulatives as needed. Then identify orally and in writing the missing number in an addition or subtraction equation.

Use fact family triangles, number lines and word walls to complete a math problem and write the
missing number in an addition or subtraction equation.

**New Jersey Student Learning Standard(s):**
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. *(benchmarked)*

**Student Learning Objective 8:** Count to 100 orally, read and write numerals, and write numerals to represent the number of objects *(up to 100).*

**Modified Student Learning Objectives/Standards:**
M.EE.1.NBT.A.1 Count by ones to 30.

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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>MP 2</td>
<td>N/A</td>
<td>Rote counting forward to 100 by counting on from any number less than 100.</td>
<td>Count on starting at any number less than 100 and continue to 100.</td>
<td>Making Sets of More/Less/Same</td>
</tr>
<tr>
<td>MP 7</td>
<td></td>
<td>Students are developing strategies for counting that build on the understanding of how the numbers in the counting sequence are related—each number is one more (or one less) than the number before (or after).</td>
<td>Read, write and represent a number of objects with a written numeral.</td>
<td>Spin and Represent</td>
</tr>
<tr>
<td>MP 8</td>
<td></td>
<td>It is important for students to connect different representations for the same quantity or number. Students use materials to build models that represent a number, then they connect this model to the</td>
<td>Recognize and understand patterns on a 100 chart. (tens and ones)</td>
<td>Hop To It</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A number line can represent the order of numbers.</td>
<td>1.NBT.A.1 Hundred Chart Digit Game</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Counting finds out the answer to “how many” objects in a set.</td>
<td><strong>Count to 100</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Numbers can represent quantity, position, location and relationships.</td>
<td><strong>Count to 100 Fit Version 2</strong></td>
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<td></td>
<td></td>
<td></td>
<td><strong>Count to 100 Fit Version 3</strong></td>
</tr>
</tbody>
</table>
Students learn to use numerals to represent numbers by relating their place-value notation to their models. They build on their previous experiences with numbers 0 to 20 to create models for 21 to 100 with groupable materials (beans, unifix cubes, and plastic links). Students represent the quantities shown in the models by placing numerals in labeled hundreds, tens and ones columns. The students then move to representing the numbers in standard form, where the group of hundreds, tens, and ones shown in the model matches the left-to-right order of digits in numbers.

Post the number words in the classroom for students to be able to read and write them.

Use a number line or hundred chart when counting.

Use choral counting.

**SPED Strategies:**
Write and orally count from a number other than zero between 0
and 100, using a word wall, number line and a hundred chart.

Students use objects, words, and/or symbols to express their understanding of numbers. They extend their counting up to 100 by counting by 1’s. Some students may begin to count in groups of 10 while other students may use groups of 2’s or 5’s to count.

Students extend reading and writing numerals beyond 20 to 100. After counting objects, students write the numeral or use numeral cards to represent the number.

Given a numeral, students read the numeral, identify the quantity that each digit represents using numeral cards, and count out the given number of objects.

Students should experience counting from different starting points (e.g., start at 83; count to 100).

**ELL Strategies:**
Introduce and chart academic vocabulary with visuals: number words 0-100, ones, tens, hundreds.
<table>
<thead>
<tr>
<th>Demonstrate comprehension of step-by-step directions and numbers in English. Then identify orally or repeat numbers and finally write the numerals.</th>
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</thead>
<tbody>
<tr>
<td>Demonstrate comprehension of single step oral directions and numbers stated orally. Identify orally and in writing numerals and groups of objects representing a numeral to 100.</td>
</tr>
<tr>
<td>Using a counting chart, the teacher models how to identify orally and in writing numerals and groups of objects (such as base-ten blocks) representing a number to 100.</td>
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</tbody>
</table>
## Unit 1 Vocabulary

<table>
<thead>
<tr>
<th>Add</th>
<th>Most</th>
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</thead>
<tbody>
<tr>
<td>Add</td>
<td>Number</td>
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<tr>
<td>Addends</td>
<td>(Number) After</td>
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<tr>
<td>Adding to</td>
<td>(Number) Before</td>
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<tr>
<td>Addition</td>
<td>Number Line</td>
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<td>Associative Property of Addition</td>
<td>Numeral</td>
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<tr>
<td>Backwards</td>
<td>Object</td>
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<tr>
<td>Commutative Property of Addition</td>
<td>Ones</td>
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<tr>
<td>Comparing with unknowns in all positions</td>
<td>Order</td>
</tr>
<tr>
<td>Compose</td>
<td>Part-Part-Whole</td>
</tr>
<tr>
<td>Count back</td>
<td>Putting Together</td>
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<tr>
<td>Count on</td>
<td>Reasoning</td>
</tr>
<tr>
<td>Decompose</td>
<td>Related Facts</td>
</tr>
<tr>
<td>Difference</td>
<td>Representation</td>
</tr>
<tr>
<td>Digit</td>
<td>Solve</td>
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<tr>
<td>Equal</td>
<td>Subtract</td>
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<tr>
<td>Equal sign</td>
<td>Subtraction</td>
</tr>
<tr>
<td>Equation (number sentence)</td>
<td>Sum</td>
</tr>
<tr>
<td>False</td>
<td>Take Away</td>
</tr>
<tr>
<td>Fewer</td>
<td>Taking Apart</td>
</tr>
<tr>
<td>Forward</td>
<td>Taking From</td>
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<tr>
<td>Friendly number</td>
<td>Ten Frame</td>
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<tr>
<td>Is the same as</td>
<td>Tens</td>
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<tr>
<td>Less than</td>
<td>Total</td>
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<tr>
<td>Make a ten</td>
<td>True</td>
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<tr>
<td>Making a ten</td>
<td>Unknown Addends</td>
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<tr>
<td>Minus</td>
<td>Value</td>
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<tr>
<td>More</td>
<td>Who</td>
</tr>
<tr>
<td>More than</td>
<td>Whole</td>
</tr>
</tbody>
</table>
## References & Suggested Instructional Websites

- [https://www.engageny.org/](https://www.engageny.org/)
- [https://www.teachingchannel.org/](https://www.teachingchannel.org/)
- [https://www.illustrativemathematics.org/](https://www.illustrativemathematics.org/)
- [http://www.k-5mathteachingresources.com/](http://www.k-5mathteachingresources.com/)
- [http://betterlesson.com/](http://betterlesson.com/)
- [https://learnzillion.com/](https://learnzillion.com/)
- [http://www.insidemathematics.org/](http://www.insidemathematics.org/)
- [http://greatminds.net/](http://greatminds.net/)
- [https://www.georgiastandards.org/Georgia-Standards/Pages/Math-K-5.aspx](https://www.georgiastandards.org/Georgia-Standards/Pages/Math-K-5.aspx)
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- [https://www.mathsisfun.com/definitions/index.html](https://www.mathsisfun.com/definitions/index.html)
**Field Trip Ideas**

**HEAVEN HILLS** – Heaven Hills is a locally owned and operated garden center and farm market in Vernon, NJ. The only thing better than a getaway to the country is gathering a large group of your classmates, coworkers, friends and family to join you on a visit to Heaven Hill Farm to experience a true working farm for some exclusive educational and seasonal fun.

http://www.heavenhillfarm.com/tours-for-schools/

**HILLVIEW FARMS** - We welcome schools and groups to visit our family farm to gain a positive farm experience. By visiting Hillview Farms, we aim to engage students in the workings of a farm. They will experience different types of farm animals, how they live, what they eat, how they feel and sound. They learn why all the different animals are raised, how the farm produces its own food, and how that food is harvested and stored.

http://hillviewfarmnj.com/

**ALSTEDE FARMS**  Chester, NJ - Let us teach you about farming in the most fun way! We open our doors to groups of all ages and sizes because we understand the importance of hands-on education. We personalize each farm tour and field trip, depending on the group’s interests. You will navigate our farm by taking hayrides out to the beautiful fields and orchards, greenhouses, school classroom, our friendly animals and last but not least – having a great outdoor day at our family owned farm. You choose the other activities: climb the giant hay pyramid, have lunch and refreshing lemonade or take a self-guided tour of our animals.

http://alstedefarms.com/group-events-and-tours/group-farm-tours/?gclid=CIjzn-W4lMYCFQgUHwodK1oAxA

**GREEN MEADOWS FARM** Hazlet, NJ - Green Meadows Petting Farm in Hazlet, New Jersey is a unique hands-on learning adventure with hundreds of friendly farm animals. Some of our many petting zoo activities include milking a cow, feeding our animals, tractor drawn hayrides and fall pumpkin picking. Give us a call and we'll bring the fun to you! We're the ideal farm animal experience for families, birthday parties, groups and school field trips!

http://www.greenmeadowsfarmnj.com/

**PENNINGS ORCHARD** Warwick, NY - We look forward to seeing you for all your favorite activities including the u-pick, farm market, pumpkin fields, hayrides, farm animals, kiddie maze and more.

http://www.penningsorchard.com
Field Trip Ideas

BERGEN COUNTY ZOO Paramus, NJ - This great zoo, located in Van Saun County Park, is home to a wide variety of wild and domestic animals, living in recreated habitats natural to each species. School Programs for grades Pre-K and up include ‘Sense’-Sational Animals (grades Pre-K - 1): a unique introduction to animals through the five senses; Survival Strategies (grades 2 and up): an exploration of incredible adaptations for survival; Dispelling the Myths (all grades): unravels riddles like Are Snakes Really Slimy? Can Owls Really Turn Their Heads all the way around? and more; and several others, including thematic Guided Tours of the zoo for Pre-K and up. A program takes 30 - 40 minutes per group of 25.
https://www.co.bergen.nj.us/departments-and-services/parks

TURTLE BACK ZOO West Orange, NJ - We have daily, free live animal programs. We also offer programs for groups that can be scheduled for an Education Center Classroom. There is a fee for these programs and they have to be scheduled at least three weeks in advance. Programs can be especially tailored to meet your needs.
http://turtlebackzoo.com/education/

BRONX ZOO Bronx, NY - Visit the largest urban zoo in America and get up close to more than 600 species from around the globe. Meet exotic animals, birds, reptiles, and insects from across Asia, Africa, the Americas and more without ever leaving the Bronx.
http://bronxzoo.com/field-trips

LIBERTY SCIENCE CENTER Jersey City, NJ - An interactive science museum and learning center located in Liberty State Park. The center, which first opened in 1993 as New Jersey's first major state science museum, has science exhibits, the largest IMAX Dome theater in the United States, numerous educational resources, and the original Hoberman sphere.
http://lsc.org/plan-your-visit/

MATH CONNECTION FOR ALL FIELD TRIPS:
- count objects
- decompose numbers
- answer how many questions
- create real-life addition and subtraction word problems
- compare numbers
- organize, represent, and interpret data with up to three categories
- identify and name the attributes of two-dimensional and three-dimensional shapes
- measure and order objects by length