MATHEMATICS

Grade K: Unit 3
Place Value & Measurement
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 mathematics instructional model will be used as the basis for all mathematics instruction.

Kindergarten Mathematics consists of the following domains: Counting and Cardinality (CC), Operations and Algebraic Thinking (OA), Number and Operations in Base Ten (NBT), Measurement and Data (MD), and Geometry (G). In Kindergarten, instructional time should focus on two critical areas: (1) Representing and comparing whole numbers, initially with sets of objects (2) Describing shapes and space. More learning time in Kindergarten should be devoted to number than to other topics.

1) Students use numbers, including written numerals, to represent quantities and to solve quantitative problems, such as counting objects in a set; counting out a given number of objects; comparing sets or numerals; and modeling simple joining and separating situations with sets of objects, or eventually with equations such as $5 + 2 = 7$ and $7 – 2 = 5$. (Kindergarten students should see addition and subtraction equations, and student writing of equations in kindergarten is encouraged, but it is not required.) Students choose, combine, and apply effective strategies for answering quantitative questions, including quickly recognizing the cardinalities of small sets of objects, counting and producing sets of given sizes, counting the number of objects in combined sets, or counting the number of objects that remain in a set after some are taken away.

2) Students describe their physical world using geometric ideas (e.g., shape, orientation, spatial relations) and vocabulary. They identify, name, and describe basic two-dimensional shapes, such as squares, triangles, circles, rectangles, and hexagons, presented in a variety of ways (e.g., with different sizes and orientations), as well as three-dimensional shapes such as cubes, cones, cylinders, and spheres. They use basic shapes and spatial reasoning to model objects in their environment and to construct more complex shapes.
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 Standard (NJSL). 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
## Pacing Chart – Unit 3

<table>
<thead>
<tr>
<th>#</th>
<th>Student Learning Objective</th>
<th>NJSLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Count <strong>to 70</strong> by ones and by tens.</td>
<td><strong>K.CC.A.1</strong>*</td>
</tr>
<tr>
<td>2</td>
<td>Describe measurable attributes of multiple objects and describe several measurable attributes of a single object.</td>
<td><strong>K.MD.A.1</strong></td>
</tr>
<tr>
<td>3</td>
<td>Directly compare two objects with a measurable attribute in common; use <em>more of</em> or <em>less of</em> to compare the objects.</td>
<td><strong>K.MD.A.2</strong></td>
</tr>
<tr>
<td>4</td>
<td>Count the objects in given categories and sort the categories by count (up to 10 objects).</td>
<td><strong>K.MD.B.3</strong>*</td>
</tr>
<tr>
<td>5</td>
<td>Correctly names shapes regardless of their orientation or overall size.</td>
<td><strong>K.G.A.2</strong></td>
</tr>
<tr>
<td>6</td>
<td>Identify shapes as two-dimensional (lying in a plane, <em>flat</em>) or three-dimensional (<em>not flat, solid</em>).</td>
<td><strong>K.G.A.3</strong></td>
</tr>
<tr>
<td>7</td>
<td>Decompose numbers less than or equal to ten into pairs of numbers in more than one way and record with a drawing or equation.</td>
<td><strong>K.OA.A.3</strong></td>
</tr>
<tr>
<td>8</td>
<td>Given a number less than 10, find the number that makes 10.</td>
<td><strong>K.OA.A.4</strong></td>
</tr>
<tr>
<td>9</td>
<td>Compose and decompose numbers from 11 to 19 into a group of ten and one(s) with or without manipulatives; record each composition or decomposition through a drawing or equation.</td>
<td><strong>K.NBT.A.1</strong>*</td>
</tr>
<tr>
<td>10</td>
<td>Use mental math strategies to solve addition and subtraction facts within 5.</td>
<td><strong>K.OA.A.5</strong>*</td>
</tr>
</tbody>
</table>

**Instruction:** 8 weeks  
**Assessment:** 1 week
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)

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)

Teacher and students practice mathematics processes together through interactive activities, problem solving, and discussion. (whole group or small group instruction)
<table>
<thead>
<tr>
<th>Effective Pedagogical Routines/Instructional Strategies</th>
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<tr>
<td>Collaborative Problem Solving</td>
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<tr>
<td>Connect Previous Knowledge to New Learning</td>
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<tr>
<td>Making Thinking Visible</td>
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<tr>
<td>Develop and Demonstrate Mathematical Practices</td>
</tr>
<tr>
<td>Inquiry-Oriented and Exploratory Approach</td>
</tr>
<tr>
<td>Multiple Solution Paths and Strategies</td>
</tr>
<tr>
<td>Use of Multiple Representations</td>
</tr>
<tr>
<td>Explain the Rationale of your Math Work</td>
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<tr>
<td>Quick Writes</td>
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<tr>
<td>Pair/Trio Sharing</td>
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<tr>
<td>Turn and Talk</td>
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<tr>
<td>Charting</td>
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<td>Gallery Walks</td>
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<tr>
<td>Small Group and Whole Class Discussions</td>
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<tr>
<td>Student Modeling</td>
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<tr>
<td>Analyze Student Work</td>
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<tr>
<td>Identify Student’s Mathematical Understanding</td>
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<tr>
<td>Identify Student’s Mathematical Misunderstandings</td>
</tr>
<tr>
<td>Interviews</td>
</tr>
<tr>
<td>Role Playing</td>
</tr>
<tr>
<td>Diagrams, Charts, Tables, and Graphs</td>
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<tr>
<td>Anticipate Likely and Possible Student Responses</td>
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<td>Collect Different Student Approaches</td>
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<tr>
<td>Multiple Response Strategies</td>
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<tr>
<td>Asking Assessing and Advancing Questions</td>
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<td>Revoicing</td>
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<td>Marking</td>
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<tr>
<td>Recapping</td>
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<tr>
<td>Challenging</td>
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<tr>
<td>Pressing for Accuracy and Reasoning</td>
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<tr>
<td>Maintain the Cognitive Demand</td>
</tr>
</tbody>
</table>
Educational Technology

Standards

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

➢ 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, Xtramath, Learnzillion, or Khanacademy.

➢ Research and Information Fluency
  • Use digital tools and online resources to explore a problem or issue.
    Example: Students will use online tools such as number frames, number lines, number racks or number pieces (base ten).
    https://www.mathlearningcenter.org/resources/apps

➢ The Nature of Technology
  • Describe how designed products and systems are useful at school, home, and work.
    Example: Students will explain how tools such as a hundreds chart, number lines, base ten blocks, ten frames, part-part-whole mats, place value chart, or number bonds are useful. Students will describe how using a ruler or balance scale is useful.

  • Identify a system and the components that work together to accomplish its purpose.
    Example: Students will explain how base ten blocks, ten frames, part-part-whole mats, place value charts, or number bonds represent the parts of a problem.

➢ Design
  • Brainstorm ideas on how to solve a problem or build a product.
    Example: Students will work together to describe strategies for decomposing numbers into pairs of numbers in more than one way and decomposing teen numbers into a group of ten and ones.

➢ 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 explain the steps for classifying objects into given categories and sorting the categories by count.
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 judgements about the use of specific tools and use tools to explore and deepen understanding of counting and addition.

- **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. They will ask probing questions to clarify or improve arguments.

- **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. Students will monitor and evaluate progress and change course as necessary.
Career Ready Practices

- **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.
### 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>Specific Proficiency</th>
</tr>
</thead>
</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

<table>
<thead>
<tr>
<th>Sensory Supports*</th>
<th>Graphic Supports*</th>
<th>Interactive Supports*</th>
<th>Verbal and Textual Supports</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Real-life objects (realia) or concrete objects</td>
<td>• Graphs</td>
<td>• In a whole group</td>
<td>• Labeling</td>
</tr>
<tr>
<td>• Physical models</td>
<td>• Charts</td>
<td>• In a small group</td>
<td>• Students’ native language</td>
</tr>
<tr>
<td>• Manipulatives</td>
<td>• Timelines</td>
<td>• With a partner such as Turn-and-Talk</td>
<td>• Modeling</td>
</tr>
<tr>
<td>• Pictures &amp; photographs</td>
<td>• Number lines</td>
<td>• In pairs as a group (first, two pairs work independently, then they form a group of four)</td>
<td>• Repetitions</td>
</tr>
<tr>
<td>• Visual representations or models such as diagrams or drawings</td>
<td>• Graphic organizers</td>
<td>• In triads</td>
<td>• Paraphrasing</td>
</tr>
<tr>
<td>• Videos &amp; films</td>
<td>• Graphing paper</td>
<td>• Cooperative learning structures such as Think-Pair-Share</td>
<td>• Summarizing</td>
</tr>
<tr>
<td>• Newspapers or magazines</td>
<td></td>
<td>• Interactive websites or software</td>
<td>• Guiding questions</td>
</tr>
<tr>
<td>• Gestures</td>
<td></td>
<td>• With a mentor or coach</td>
<td>• Clarifying questions</td>
</tr>
<tr>
<td>• Physical movements</td>
<td></td>
<td></td>
<td>• Probing questions</td>
</tr>
<tr>
<td>• Music &amp; songs</td>
<td></td>
<td></td>
<td>• Leveled questions such as What? When? Where? How? Why?</td>
</tr>
</tbody>
</table>

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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 helps 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 helps students question and unpack biases & stereotypes.
- This unit / lesson helps students examine, research and question information and sources.
- The curriculum encourages discussion and understanding about the groups of people being represented.
- This unit / lesson challenges dominant perspectives.

**EQUITABLE PEDAGOGY**
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 student 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

- **Run Problem-Based Learning Scenarios:** Present relatable real-world problems for your students to solve, explicitly referencing culture and communities when applicable.
  
  **Example:** Students may bring items from home when describing measurable attributes, naming shapes, and identifying two-dimensional and three-dimensional shapes. These items may also be used to sort objects, count the objects in given categories and sort the categories by count. Use a variety of visuals for counting objects such as fruits, vehicles, toys, etc.

- **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>
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<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>
<td></td>
<td>Color code materials</td>
</tr>
</tbody>
</table>
Differentiated Instruction

Accommodate Based on Content Specific Needs:

- Use a variety of manipulatives for counting (counters, chips, coins, cubes, links, or shapes).
- Use a hundred chart or number line to start counting from various numbers to keep track of the number of items.
- Sing songs/chants to count to 70.
- Chunk the numbers by tens to recite orally the numbers to 70 by tens.
- Use numeral cards rather than writing the numerals.
- Use counting mats with counters.
- Use subitizing cards of ten frames, dice, etc.
- Use part-part-whole mats, ten frames, number lines, number bonds, calendar, and hundred chart to count and decompose numbers.
- Use realia (real-life objects) or pictures to compare.
- Use graphic organizers to classify objects into categories; then count and write the number of objects.
- Label when discussing attributes or identifying shapes.
- Expose students to a variety of shapes in different orientations in order to eliminate the misconceptions that upside down shapes are different.
- Use flat and solid shapes and real world objects when comparing two-dimensional and three-dimensional shapes.
- Use interactive tools for decomposing numbers.
- Use five frames, part-part-whole mats, fact families, fact triangles, and number bonds to build fluency of addition and subtraction within five.
Interdisciplinary Connections

Model interdisciplinary thinking to expose students to other disciplines.

Social Studies Connection:
*Race to Five, Find a Partner, Race to 20 Revisited, Make a 10 Go Fish*  Social Studies 6.1.4.A.1, 6.3.4.A.1
- Through the use of games, students will explain the need for rules and fairness for all.
- Through the use of games, students will identify examples of responsible citizenship in the school setting.

*Dropping Pennies, Hidden Pennies*  Social Studies 6.1.4.D.17, 6.1.4.C.10
- Introduce the penny and Abraham Lincoln as the figure on the head of the penny. Discuss the significance of Abraham Lincoln as the President of the United States.

Science Connection:
*Find a Partner, Measurement Hunt, Measurement Flashcards, Which is Heavier?, Which is Longer?, Longer and Shorter*  Science K-LSI-1
- Compare the observable physical properties of objects.

ELA Connection:
*Rumplestiltskin Is My Name:*  ELA Standard RL.K.1, RL.K.10
- Read Alouds such as *Chrysanthemum*

*Measurement and Me, Find a Partner:*  ELA Standard RL.K.1, RL.K.10
- Read Alouds such as *Measuring Penny or Me and the Measure of Things*

*How Heavy Is It?:*  ELA Standard RL.K.1, RL.K.10
- Read Aloud such as *Mighty Maddie* by Stuart J. Murphy

*Geometry Sentence*  ELA Standard W.K.2
- Students write sentences using geometry stems.
Interdisciplinary Connections

**Possible Read Alouds:** ELA Standard RL.K.1, RL.K.10
- Ask and answer questions about key details.
- Actively engage in group reading activities with purpose and understanding.

**Counting:**
- *Ten Black Dots* by Donald Crews  [https://www.youtube.com/watch?v=h3ePDTSThq0](https://www.youtube.com/watch?v=h3ePDTSThq0)
- *Ten, Nine, Eight* by Mollie Bang  [https://www.youtube.com/watch?v=l7xXYw9ldZQ](https://www.youtube.com/watch?v=l7xXYw9ldZQ)
- *Ten Sly Piranhas* by William Wise (Counting Back from 10)  [http://www.youtube.com/watch?v=LN0eYUgx4u0](http://www.youtube.com/watch?v=LN0eYUgx4u0)
- *Ten Monsters in a Bed* by Rozanne Lanczak Williams
- *Anno’s Counting House* by Mitsumasa Anno
- *One More Bunny* by Rick Walton (Adding from One to Ten)
- *So Many Bunnies* by Rick Walton (Counting to 26)  [https://www.youtube.com/watch?v=4wO-v53RnkU](https://www.youtube.com/watch?v=4wO-v53RnkU)
- *Quack and Count* by Keith Baker (combinations to 7)  [https://www.youtube.com/watch?v=qyFWbhR7MOA](https://www.youtube.com/watch?v=qyFWbhR7MOA)

**Measuring:**
- *Me and the Measure of Things* by Joan Sweeney
- *Measuring Penny* by Loreen Leedy  [https://www.youtube.com/watch?v=-kH1Qh6bgq0](https://www.youtube.com/watch?v=-kH1Qh6bgq0)
- *Mighty Maddie* by Stuart Murphy

**Shapes:**
- *The Shape of Things* by Dayle Ann Dobbs  [http://www.youtube.com/watch?v=1h1HcChju_0](http://www.youtube.com/watch?v=1h1HcChju_0)
- *When a Line Bends ... A Shape Begins* by Rhonda Gowler Greene  [https://www.youtube.com/watch?v=fob-70WluWk&list=PL8gb4LkBXeKMHxeYHoKKoa8vBeESRy7u](https://www.youtube.com/watch?v=fob-70WluWk&list=PL8gb4LkBXeKMHxeYHoKKoa8vBeESRy7u)
- *The Greedy Triangle* by Marilyn Burns  [http://www.youtube.com/watch?v=kPul4XyyZUE](http://www.youtube.com/watch?v=kPul4XyyZUE)
- *Round Trip* by Ann Jonas
- *Eight Hands Round* by Ann Whitford Paul
- *Shape* by Henry Arthur Pluckrose
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
Running Records (Kindergarten Only)

The Kindergarten Mathematics Running Record (KMRR) Interview is an oral interview that is individually administered to:

- students who do not have Pre-Kindergarten portfolios
- new students entering after the school year has begun, to assess their understanding
- students who require additional monitoring to show progress or lack of progress based on teacher observation and assessment results

There are two interviews focused on the numeracy domains of:

- **Counting and Cardinality KMRR-CC**
  - 3 cycles
  - The suggested interview windows are October, January, and April/May, but may be given to individual students as needed.

- **Operations and Algebraic Thinking KMRR-OA**
  - 2 cycles
  - The suggested interview windows are January/February, and April/May, but may be given to individual students as needed.

Please note that the two interviews do not need to be given to the same students. A student who has completed the Counting and Cardinality interview would then move to Operations in Algebraic Thinking. A student may begin mid-year with Operations and Algebraic Thinking if it is believed he/she has mastery of Counting and Cardinality.

**The Design Structure of the KMRR Interview**

The interview items are organized into cycles. Each cycle is intentionally designed to provide students a variety of opportunities to demonstrate their understanding of concepts within a particular domain. Since the cycles are developmental in nature, successive cycles build on the previous cycle and provide multiple chances for the students to answer similar interview items. These cycles are directly associated with an increase in size of number and quantity with which students work.

**How to use the KMRR Interview**

Begin the interview with the Counting and Cardinality interview. Ask the first interview item in the first cycle of this section of the interview, then continue asking the interview items in the order they are provided. After each item, record the student response on the Student Documentation Sheet. Continue asking interview items and recording student responses until the student incorrectly answers three consecutive items. This may go beyond one cycle. (Depending on the student, the teacher may choose to ask an additional item or two beyond the three consecutive errors.) The teacher should note student placement on the Domain Summary.
# New Jersey Student Learning Standards

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>K.CC.A.1</strong></td>
<td>Count to 100 by ones and by tens. <em>(benchmarked)</em></td>
</tr>
<tr>
<td><strong>K.MD.A.1</strong></td>
<td>Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.</td>
</tr>
</tbody>
</table>
| **K.MD.A.2** | Directly compare two objects with a measurable attribute in common, to see which object has “more of” “less of” the attribute, and describe the differences.  
*For example, directly compare the heights of two children and describe one child as taller/shorter.* |
| **K.MD.B.3** | Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. *(benchmarked)* |
| **K.G.A.2** | Correctly name shapes regardless of their orientation or overall size. |
| **K.G.A.3** | Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”) |
| **K.OA.A.3** | Decompose numbers less than or equal to 10 into pairs in more than one way, *e.g. using objects or drawings*, and record each decomposition by a drawing or equation (*e.g. 5 = 3 + 2 and 5 = 4 + 1)* |
| **K.OA.A.4** | For any number from 1 to 9, find the number that makes 10 when added to the given number *e.g. by using objects or drawings*, and record the answer with a drawing or equation. |
## New Jersey Student Learning Standards

### K.NBT.A.1
Compose and decompose numbers from 11 to 19 into ten ones and some further ones, *e.g. by using objects or drawings*, and record each composition or decomposition by a drawing or equation (*e.g. 18 = 10 + 8*); Understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones. *(benchmarked)*

### K.OA.A.5
Demonstrate fluency for addition and subtraction within 5 (by the end of Kindergarten). *(benchmarked)*
**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>
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<th>Grade: Kindergarten</th>
<th>Unit: 3 (Three)</th>
<th>Topic: Place Value and Measurement</th>
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**NJSLS:**

**Unit Focus:**
- Know number names and the count sequence to 70
- Describe and compare measurable attributes
- Classify and count the number of objects in categories
- Identify and describe shapes
- Understand addition as putting together and adding to understand subtraction as taking apart and taking from
- Work with numbers 11-19 to gain foundations for place value

**New Jersey Student Learning Standard(s):**
K.CC.A.1: Count to 100 by ones and by tens. *(benchmarked)*

**Student Learning Objective 1:** Count to 70 by ones and by tens.

**Modified Student Learning Objectives/Standards:**
M.EE.K.CC.A.1 - Count by ones up to 30.

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<th>Tasks/Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP 7 MP 8</td>
<td>N/A</td>
<td>Students know the number names. Students rote count by starting at 1 and counting to 70. This objective does not require recognition of numerals. The focus is on the number sequence.</td>
<td>How do we use counting in our everyday lives? How do we count? There are patterns in the way numbers are formed. For example, each decade has a</td>
<td>Counting by Ones to 100 (Continue throughout the year) Assessing Counting Sequences Part 1</td>
</tr>
</tbody>
</table>
Counting tells how many things are in a set.
Use concrete objects and oral counting.
Use a variety of manipulatives for counting (counters, chips, coins, cubes, links, or shapes.)

**SPED Strategies:**
Recite orally the numbers 1-70 and/or use gestures and point to numbers during the song or chant.
Provide visual representations.
Use 100 chart.
Provide flash cards (digital and tactile).

**ELL Strategies:**
Introduce and chart the academic vocabulary: Count, number words, by tens, by ones, skip count.
Repeat numbers and use gestures to recite orally the numbers to 70 by ones and tens.
Chunk the numbers by tens to recite orally the numbers to 70 by tens.

Sets of 10 can be perceived as single entities or units.

symbolic pattern reflective of the 0-9 sequence. (20, 21, 22…29)
Sets of 10 can be perceived as single entities or units.

Counting by Ones Song
http://www.youtube.com/watch?v=gDTyHfjE_sk
Count by Ones Fit
https://www.youtube.com/watch?v=QbHobZOKY5w
https://www.youtube.com/watch?v=yTeUqWGCkjA

Counting by Tens to 100 Song
https://www.youtube.com/watch?v=uYRTtwZGwj8
or
https://www.youtube.com/watch?v=-gmEe0_ex8

Count by Tens Fit
https://www.youtube.com/watch?v=Rd5DBkP9avw

Visual Counter
http://www.commoncoresheets.com/SortedByGrade.php?Sorted=kcc1
New Jersey Student Learning Standard(s):
K.MD.A.1: Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.

Student Learning Objective 2: Describe measurable attributes of multiple objects and describe several measurable attributes of a single object.

Modified Student Learning Objectives/Standards:
EE.K.MD.1-3. Classify objects according to attributes (big/small, heavy/light).

<table>
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<tr>
<td>MP 7</td>
<td>N/A</td>
<td>Use everyday objects to point out to students how the objects have measurable attributes. Weight, length, and capacity (volume) are different concepts that are most effectively learned one at a time. A single object can have more than one measurable attribute. Teachers should have exploratory activities that allow students to &quot;play&quot; with the different measurable concepts, with objects that have those measurable attributes. <strong>SPED Strategies:</strong> Students should compare objects verbally and then focus on specific attributes. They may identify</td>
<td>How can you describe the attributes of an object? How do we tell which object is longer? How do we tell which object is heavier? When comparing two lengths, one end of each length must match. The size of an object does not always tell you its weight (larger does not always mean heavier).</td>
<td>Measurement and Measuring Which is Heavier? (Covered by tasks in SLO 3)</td>
</tr>
</tbody>
</table>
measurable attributes such as length, width, height, and weight. For example, when describing a soda can, a student may talk about how tall, how wide, how heavy, or how much liquid can fit inside. These are all measurable attributes.

Non-measurable attributes include: words on the object, colors, pictures, etc.

**ELL Strategies:**
Introduce and chart the academic vocabulary: describe, length, weight.

The teacher models using words that describe objects with attributes (ex. tall, big, short, wide, small, heavy) using sentence frames (____ is ____).
New Jersey Student Learning Standard(s):
K.MD.A.2: Directly compare two objects with a measurable attribute in common, to see which object has “more of” “less of” the attribute, and describe the differences. *For example, directly compare the heights of two children and describe one child as taller/shorter.*

**Student Learning Objective 3:** Directly compare two objects with a measurable attribute in common; use *more of* or *less of* to compare the objects.

**Modified Student Learning Objectives/Standards:**
EE.K.MD.1-3. Classify objects according to attributes (big/small, heavy/light).

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<tr>
<td>MP 6 MP 7</td>
<td>N/A</td>
<td>Have balance scales set out for children to explore how different objects can be weighed. Then children will begin to understand that some objects are &quot;heavier&quot; and some are &quot;lighter&quot;. Students need a great deal of exposure to comparative language that is used to make comparisons between two objects in a set. Students need ample experiences with comparing objects in order to discover the importance of lining up the ends of objects in order to have an accurate measurement. Have sentence strips with words such as “is longer than”, “is heavier than” for students to use when comparing objects.</td>
<td>Objects have measurable attributes such as length, capacity, and weight that can be compared and described. Comparing by height is similar to comparing by length. How do we tell which object is longer? How do we tell which object is heavier? When comparing two lengths, one end of each length must match.</td>
<td>Find a Partner Rumplestiltskin Is My Name Measurement Hunt Measurement Flashcards How Heavy Is It? The Weight of Things Comparing Containers Riddle Me! Does How I Measure Matter</td>
</tr>
</tbody>
</table>
Guide students to communicate those comparisons and articulate the differences between two objects.

**SPED Strategies:**
When making direct comparisons for length, students must attend to the “starting point” of each object. For example, the ends need to be lined up at the same point, or students need to compensate when the starting points are not lined up (conservation of length includes understanding that if an object is moved, its length does not change; an important concept when comparing the lengths of two objects).

Language plays an important role in this standard as students describe the similarities and differences of measurable attributes of objects (e.g., shorter than, taller than, lighter than, the same as, etc.).

**ELL Strategies:**
Introduce and chart the academic vocabulary: Compare, describe, taller, shorter, more of, less of.

Use single words to compare and describe two objects with a measurable attribute in common.

The size of an object does not always tell its weight (larger does not always mean heavier).

When given to two sets of objects, students should reason as to which has more or less.

**Sam’s Train**
(comparative 3 trains)

**Longer and Shorter?**
The teacher models comparing and describing two objects with measurable attributes (ex. taller, bigger, shorter, wider, smaller, heavier) using sentence frames (____ is ___ than ____).

Use realia (real-life objects) or pictures to compare.

<table>
<thead>
<tr>
<th>New Jersey Student Learning Standard(s):</th>
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<tbody>
<tr>
<td>K.MD.B.3: Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. *(benchmarked)</td>
</tr>
</tbody>
</table>

**Student Learning Objective 4:** Count the objects in given categories and sort the categories by count (up to 10 objects).

**Modified Student Learning Objectives/Standards:**
EE.K.MD.1-3. Classify objects according to attributes (big/small, heavy/light).

<table>
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<tbody>
<tr>
<td>MP 2</td>
<td>N/A</td>
<td>Limit category counts up to 10. Identify similarities and differences between objects and use the identified attributes to sort a collection of objects. Then the students count the amount in each set. Finally, the students sort or group each of the sets by the amount in each set so that like amounts are grouped together but not necessarily ordered.</td>
<td>Students use color words, shapes, and descriptive words. Attributes such as color, shape, or size can be used to sort the same set of objects in different ways. How can you sort the objects? How can you classify objects into categories?</td>
<td>Fun with Sorting Sorting Money Sorting Attribute Blocks Sort and Count 2</td>
</tr>
</tbody>
</table>
For example, when exploring a collection of buttons:
First, the student separates the buttons into different piles based on color (all the blue buttons are in one pile, all the red buttons are in a different pile, etc.). Then the student counts the number of buttons in each pile: blue (5), green (4), red (3), purple (4). Finally, the student organizes the groups by the quantity. “I put the purple buttons next to the green buttons because purple also had (4). Blue has 5 and red has 3. There aren’t any other colors that have 5 or 3. So they are sitting by themselves.”

Have students sort coins to help them identify coins.

Have students sort shapes.

**SPED Strategies:**
Possible objects to sort include buttons, shells, shapes, beans, etc. After sorting and counting, it is important for students to:
- explain how they sorted the objects;
- label each set with a category;
- answer a variety of counting questions that ask, “How many ...”

How can you count single objects and then the categories they are in?

Note similarities and differences between objects.
**New Jersey Student Learning Standard(s):**

**K.G.A.2:** Correctly name shapes regardless of their orientation or overall size.

**Student Learning Objective 5:** Correctly names shapes regardless of their orientation or overall size.

**Modified Student Learning Objectives/Standards:**

**M.EE.K.G.2-3:** Classify objects according to attributes (big/small, heavy/light).

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<tr>
<td>MP 7</td>
<td>N/A</td>
<td>Using manipulatives or paper and pencil, students will give names to various shapes, regardless of size, orientation or dimension. Through numerous experiences exploring and discussing shapes, students begin to understand that certain attributes define what a shape is called (number of sides, number of angles, etc.) and that other shapes have different attributes. All objects have a shape and a specific name. Students identify rectangles as shapes with four sides and square corners with two sets of parallel lines, including squares.</td>
<td></td>
<td>Lesson A1</td>
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<td>Lesson A2</td>
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<td>Lesson A3</td>
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<td>Lesson A4</td>
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<td></td>
<td>What Shape is This</td>
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</tbody>
</table>
Kindergarten students typically do not recognize triangles that are turned upside down as triangles.

Students need experiences manipulating shapes and looking at shapes in different orientations.

**SPED Strategies:**
Expose students to a variety of triangles in different orientations in order to eliminate the misconception that a triangle is always right-side-up and equilateral.

Students should also be exposed to many shapes in many different sizes.

**Examples:**
- Teacher makes pairs of paper shapes that are different sizes. Each student is given one shape and the objective is to find the partner who has the same shape.
- Teacher brings in a variety of spheres (tennis ball, basketball, globe, ping pong ball, etc.) to demonstrate that size doesn’t change the name of a shape.

<table>
<thead>
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<tr>
<td><a href="https://www.youtube.com/watch?v=OUMUaxiPUlo">https://www.youtube.com/watch?v=OUMUaxiPUlo</a> (This video is long. Please choose shapes to view.)</td>
</tr>
<tr>
<td><a href="https://www.youtube.com/watch?v=j-l0beQHSM8">https://www.youtube.com/watch?v=j-l0beQHSM8</a></td>
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</tr>
<tr>
<td><a href="https://www.youtube.com/watch?v=WTeqUefj3D0">https://www.youtube.com/watch?v=WTeqUefj3D0</a></td>
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</table>

**Attributes do not** (color, size, orientations).

A square has four sides and four square corners. All sides are the same length.

A circle is round and has no corners.

All triangles have three sides and three corners, but they can be different sizes.

A hexagon is a shape with six sides and six corners.

What are different shapes in our world?

How do you know what shape it is?

Is it still a triangle if I turn it like this?
### ELL Strategies:
Introduce and chart the academic vocabulary: shapes, category, sort.

The teacher models sorting shapes and the student follows oral directions to sort shapes into categories using a graphic organizer (chart/table).

Students work with a partner to follow oral directions to classify shapes into categories and name them accordingly by using a provided sentence starter (This is a _____. These are _____).

### New Jersey Student Learning Standard(s):
K.G.A.3: Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”)

### Student Learning Objective 6: Identify shapes as two-dimensional (lying in a plane, flat) or three-dimensional (not flat, solid).

### Modified Student Learning Objectives/Standards:
M.EE.K.G.2-3- Classify objects according to attributes (big/small, heavy/light).

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<tr>
<td>MP 7</td>
<td>N/A</td>
<td>Students identify and describe shapes (squares, circles, triangles, rectangles, and hexagons) by the number of sides and vertices (corners). Students identify and describe cubes, cones, cylinders, and spheres by their</td>
<td>All objects have a shape and a specific name. Two-dimensional shapes may be described by number of sides and vertices.</td>
<td>Lesson A9</td>
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<td>Lesson A10</td>
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<td>Geometry Sentence</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Shape Sort</td>
</tr>
</tbody>
</table>
flat surfaces (faces) and vertices (corners).

Students describe the shapes of the flat surfaces of solid shapes.

Students use the terms two-dimensional (flat) or three-dimensional (solid) as they discuss properties of various shapes.

**SPED Strategies:**
Two dimensional and three dimensional shapes are provided to students as a visual to help them define the similarities and differences between the dimensions:
- **Two dimensional** – length and width
- **Three dimensional** – length, width and height

Student names a picture of a shape as two dimensional because it is flat and can be measured in only two ways (length and width).

Student names an object as three dimensional because it is not flat (it is a solid object/shape) and can be measured in three different ways (length, width, height/depth).

Three-dimensional or solid figures have length, width, and height.

Flat surfaces of many solid figures have specific shapes.

How can you describe the flat surfaces of solids?

### Which is Flat? Which is Solid?
https://www.youtube.com/watch?v=7P7-Omw2cog
**ELL Strategies:**
Introduce and chart the academic vocabulary: shapes, dimensional, solid, flat.

Use objects or pictures to describe different shapes with single words or short phrases (i.e., two dimensional, flat, solid).

Sort shapes using graphic organizers (i.e., T-chart) and identify the shapes using simple sentences.

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

**K.OA.A.3:** Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., using objects or drawings, and record each decomposition by a drawing or equation (e.g. $5 = 3 + 2$ and $5 = 4 + 1$)

**Student Learning Objective 7:** Decompose numbers less than or equal to ten into pairs of numbers in more than one way and record with a drawing or equation.

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

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<tr>
<td>MP 1</td>
<td>K.OA.A.3</td>
<td>Students develop an understanding of part-whole relationships as they recognize a set of objects can be divided into smaller sub-sets and still remain the total amount. Ex. 5 can be broken into 3 and 2</td>
<td>There is more than one way to show a number. Joining parts to make a whole is one way to show addition.</td>
<td>Decomposing Numbers Books on Shelves • Goldfish • Pretty Tulips • Books on Shelves</td>
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<td>MP 2</td>
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focus on decomposing numbers less than or equal to 10 into pairs in more than one way.

- Tasks require students to record their thinking with a drawing or equation.
- Interviews (individual or small group) should target students’ abilities to meet this evidence statement.

| Students realize that a set of objects can be broken in multiple ways (5 as 3 and 2: 4 and 1) |
| Ex. A snowman has five buttons. How many ways can you use red and yellow counters to make his jacket? |
| Decompose numbers up to 10 using fingers, drawings, red and yellow counters, two-color bean counters, snap cubes, part-part-whole mats, or an organized list. Then record the equations. Use vocabulary such as “and”, “same amount as”, and “makes” before symbols (+,+) and equations (5=3+2) are introduced. |
| If equations are used, a mathematical representation (picture, objects) also needs to be present. |

**SPED Strategies**

Students may use objects such as cubes, two-color counters, square tiles, etc. to show different number pairs for a given number. For example, for the number 5, students may split a set of 5 objects into 1 and 4, 2 and 3, etc.

Students may also use drawings to show different number pairs for a given number. For example, draw 5 objects

| When breaking apart a set (decompose), students use the understanding that a smaller set of objects exists within that larger set (inclusion). |
| Why can you show the same number of objects in different ways? |
| How can the parts of a number be written as an equation? |

**Building Trains** (Addition/Combining)

- Part 2
- Shake and Spill Addition
- Dropping Pennies
- The Bike Shop
- Hidden Pennies
- Apples and Bananas
- Balloon
- Part-Whole Mats
- Jelly Bean Fun
- Seth
- Pick Two

Continue from Unit 2:
- Sums of Five
- Facts of Five
- Shake Five and Spill
New Jersey Student Learning Standard(s):
K.OA.A.4: For any number from 1 to 9, find the number that makes 10 when added to the given number e.g. by using objects or drawings, and record the answer with a drawing or equation.

Student Learning Objective 8: Given a number less than 10, find the number that makes 10.

Modified Student Learning Objectives/Standards: N/A

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<tbody>
<tr>
<td>MP 1</td>
<td>K.OA.A.4</td>
<td>Students develop an understanding of part-whole relationships as they recognize a set of objects can be divided into smaller sub-sets and still remain the total amount. Ex. 10 can be broken into 3 and 7</td>
<td>There is more than one way to make a number.</td>
<td>Name the Addend</td>
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<td>MP 2</td>
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<td>Make 10 with a Tens Frame</td>
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<td>MP 4</td>
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<td>Dinosaur Books</td>
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- Tasks should focus on students’ understanding of making 10 and representing their thinking.

- Interviews (individual or small group) should target students’ abilities to meet this evidence statement.

| Students realize that a set of objects can be broken in multiple ways. Ex. 10 as 3 and 7: 4 and 6 |
| Decompose 10 using fingers, ten frames, drawings, red and yellow counters, two-color beans, snap cubes, part-part-whole mats, number bonds, or an organized list. Then record the equations. |
| Use vocabulary such as “and”, “same amount as”, and “makes” before symbols (+,+) and equations (5=3+2) are introduced. |
| If equations are used, a mathematical representation (picture, objects) also needs to be present. |
| Use a ten frame to find the missing part. |

| Drawing Animal Pictures |
| Make a 10 Go Fish! |
| Mrs. Green’s Class |
| Shake and Spill Subtraction |
| Building Trains (Addition/Combining) Part 1 |

Joining parts to make a whole is one way to show addition.

When breaking apart a set (decompose), students use the understanding that a smaller set of objects exists within that larger set (inclusion).

Why can you show the same number of objects in different ways?

How can the parts of a number be written as an equation?

Using a Ten-Frame
“I used a ten frame for the case. Then, I put on 6 counters for juice. There’s no juice in these 4 spaces. So, 4 are missing.”
Use a part-part-whole mat to make a ten.

**Think Addition**
“I counted out 10 counters because I knew there needed to be ten. I pushed these 6 over here because they were in the container. These are left over. So there’s 4 missing.”

**SPED Strategies:**
Different models or manipulatives, such as ten-frames, cubes, two-color counters, etc., assist students in visualizing these number pairs for ten.

**Examples:**
- Students place three objects on a ten frame and then determine how many more are needed to “make a ten.”
- Students may use electronic versions of ten frames to develop this skill
**ELL Strategies:**
Introduce and chart the academic vocabulary: number words, plus, minus, part, whole.

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

**K.NBT.A.1:** Compose and decompose numbers from 11 to 19 into ten ones and some further ones, *e.g.* by *using objects or drawings*, and record each composition or decomposition by a drawing or equation (*e.g.* $18 = 10 + 8$); Understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones. *(benchmarked)*

**Student Learning Objective 9:** Compose and decompose numbers from 11 to 19 into a group of ten and one(s) with or without manipulatives; record each composition or decomposition through a drawing or equation.

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

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<tr>
<td>MP 1</td>
<td>K.NBT.A.1</td>
<td>Kindergarteners use 10 objects to represent 10 rather than creating a unit called a ten (unitizing) as done in first grade.</td>
<td>Ten can be thought of as a bundle of ten ones – called a “ten”.</td>
<td>Building Teen Numbers</td>
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<tr>
<td>MP 2</td>
<td><strong>Tasks should focus on the understanding of numbers from 11 to 19 as composed of ten “ones” and some additional number of “ones.”</strong></td>
<td>Use a ten frame to show “14 is 10 on and 4 off”</td>
<td>Why do we break numbers apart into tens and ones?</td>
<td>Label the Ten Frame</td>
</tr>
</tbody>
</table>
| MP 4 | **Tasks should require students to record their thinking with a drawing or equation.** | ![Ten Frame Example]  
$14 = 10 + 4$ | | Mystery Number |
| MP 7 | | | | On and Off the Ten Frame |
| MP 8 | | | | Ring Around the Tens |
| | | | | Making a Set of 10 and Some More |
Interviews (individual or small group) should target this understanding of composing and decomposing the teen numbers into ten “ones” and some additional number of “ones.”

After using manipulatives, write an equation.
14 = 10 + 4

Use a chart.

<table>
<thead>
<tr>
<th>All</th>
<th>On</th>
<th>Off</th>
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<tbody>
<tr>
<td>14</td>
<td>10</td>
<td>4</td>
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</table>

Count on from 10 (10, 11, 12, 13, 14)

**SPED Strategies:**
The verbal counting sequence for teen numbers is backwards – we say the ones digit before the tens digit. For example “27” reads tens to ones (twenty-seven), but 17 reads ones to tens (seven-teen).

In order for students to interpret the meaning of written teen numbers, they should read the number as well as describe the quantity. For example, for 15, the students should read “fifteen”
and state that it is one group of ten and five ones and record that $15 = 10 + 5$.

When focusing on the number “14,” students should count out fourteen objects using one-to-one correspondence and then use those objects to make one group of ten ones and four additional ones. Students should connect the representation to the symbol “14.”

Use counters, base ten blocks, etc.

**ELL Strategies:**
Introduce and chart the academic vocabulary: tens, ones, and number words

Teacher models how to use selected vocabulary with picture prompts to compose and decompose numbers from 11-19 by writing or drawing the response.

Use key, technical vocabulary in phrases to compose and decompose numbers from 11-19 by writing or drawing the response in a math journal.

Use manipulatives, such as bundles of 10s and 1s popsicle sticks) to model composing and decomposing, recording
New Jersey Student Learning Standard(s):
K.OA.A.5: Demonstrate fluency for addition and subtraction within 5 (by the end of Kindergarten). *(benchmarked)

Student Learning Objective 10: Use mental math strategies to solve addition and subtraction facts within 5.

Modified Student Learning Objectives/Standards: N/A

<table>
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<tr>
<td>MP 8</td>
<td>K.OA.A.5</td>
<td>Transition from concrete models to representational drawings to symbols alone. Students are fluent when they show accuracy (correct answer), efficiency (a reasonable amount of steps in about 3-5 seconds without resorting to counting), and flexibility (using strategies such as the distributive property). Model with many different types of concrete materials such as counters, cubes, or chips so students realize there are only particular subgroups for each number. For example, if 3 and 1 make 4 then 3 and 1 cannot make 5. Use the counting on strategy. (3,4,5 so 3+2=5).</td>
<td>How did you get the answer quickly? What strategy did you use to find the sum quickly and accurately?</td>
<td>OA Task 7a&lt;br&gt;OA Task 8a&lt;br&gt;Race to Five&lt;br&gt;Continue from Unit 2: &lt;ul&gt;&lt;li&gt;Sums of Five&lt;/li&gt;&lt;li&gt;Facts of Five&lt;/li&gt;&lt;li&gt;Shake Five and Spill&lt;/li&gt;&lt;/ul&gt;Interactive: [<a href="http://www.commoncoresheets.com/Interactive.php?Worksheet=Math/Interactive/koa5">http://www.commoncoresheets.com/Interactive.php?Worksheet=Math/Interactive/koa5</a>]</td>
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</tbody>
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Tasks/Activities:
- OA Task 7a
- OA Task 8a
- Race to Five

Continue from Unit 2:
- Sums of Five
- Facts of Five
- Shake Five and Spill

Use the counting back strategy.  
(5,4,3 so 5-2=3).

Count on to subtract.  
(5-3=? Count 3, 4, 5 so it is 2 more).

Use doubles facts. (2+2=4, so 2+3=5 because it has one more).

Use five frames, part-part-whole mats, fact families, fact triangles, and number bonds.

Use repetition of the combinations to 5 allowing sufficient time to practice all the combinations of a given number.

**SPED Strategies:**
Strategies students may use to attain fluency include:

- Counting on (e.g., for 3+2, students will state, “3,” and then count on two more, “4, 5,” and state the solution is “5”)
- Counting back (e.g., for 4-3, students will state, “4,” and then count back three, “3, 2, 1” and state the solution is “1”)
- Counting on to subtract (e.g., for 5-3, students will say, “3,” and then count up until they get to 5, keeping track of how many they counted up, stating that the solution is “2”)
- Using doubles (e.g., for 2+3, students may say, “I know that 2+2 is 4, and 1 more is 5”)
- Using commutative property (e.g., students may say, “I know that 2+1=3, so 1+2=3”)
- Using fact families (e.g., students may say, “I know that 2+3=5, so 5-3=2”)

**ELL Strategies:**
- Introduce and chart the academic vocabulary: number words, plus, minus.
- Teacher models using mental math strategies.
- Large number cards or manipulatives may be used to model as needed.
# Unit 3 Vocabulary

- adding to
- addition / add
- addition sign
- and
- angles
- associative property
- attributes
- cardinality
- circle
- commutative property
- cone
- conservation
- corners / vertices
- counting back
- counting by one
- counting on
- counting strategy
- cube
- cylinder
- decade
- difference
- digits
- edge
- equal
- Equal Shares
- equal sign
- equation
- face

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# References & Suggested Instructional Websites

- [https://www.georgiastandards.org/common-core/pages/math-k-5.aspx](https://www.georgiastandards.org/common-core/pages/math-k-5.aspx)
- [https://www.engageny.org/resource/kindergarten-mathematics](https://www.engageny.org/resource/kindergarten-mathematics)
- [http://www.illustrativemathematics.org/K](http://www.illustrativemathematics.org/K)
- [http://www.k-5mathteachingresources.com/kindergarten-math-activities.html](http://www.k-5mathteachingresources.com/kindergarten-math-activities.html)
- [http://interactivesites.weebly.com/math.html](http://interactivesites.weebly.com/math.html)

**Online Tools**
- [https://www.mathlearningcenter.org/resources/apps](https://www.mathlearningcenter.org/resources/apps)
- [Using the Rekenrek](http://bridges1.mathlearningcenter.org/media/Rekenrek_0308.pdf)
- [Five Frames](http://illuminations.nctm.org/Activity.aspx?id=3564)
- [Ten Frames](http://illuminations.nctm.org/Activity.aspx?id=3565)
- [Interactive Visuals for Counting K.CC.1](http://www.commoncoresheets.com/SortedByGrade.php?Sorted=kcc1)
- [Interactive](www.commoncoresheets.com)
- [Fact Fluency](http://www.k-5mathteachingresources.com/computational-fluency.html)
Field Trip Ideas

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=CJjzn-W4IiYCFQgUHWodK1oAxA

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

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.
http://www.co.bergen.nj.us/index.aspx?NID=437

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 for to meet your needs, including for Boy and Girl Scout groups to help with badge requirements.
http://turtlebackzoo.com/education/
Field Trip Ideas

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

LEGOLAND DISCOVERY CENTER (Yonkers, NY) – Spinning Tops (Engineering Design, Mathematics) In this exciting workshop students build LEGO® spinning tops, collect data on whose design spins the longest, while also learning about the forces that affect their tops performance. **Requires approval from Unit Superintendent**
https://westchester.legolanddiscoverycenter.com/groups-schools/school-field-trips/#pre-schools

NEW JERSEY STATE MUSEUM (Trenton, NJ) – “Stars and Shapes Forever” First stop is the animated Planetarium show, The Little Star That Could, followed by an interactive workshop. Children enjoy modeling our solar system, orbiting the sun with colorful inflatable planets, and compare the sizes of objects in the Universe. Each child gets to decorate their own star to take home. It’s a great way to introduce young children to the Planetarium and our galaxy! $3 per student (Includes Planetarium show)  
**Requires approval from Unit Superintendent**
https://www.state.nj.us/state/museum/dos_museum_school.html

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
- classify objects into given categories
- answer how many questions / create addition and subtraction events
- describe objects in the environment and describe the relative positions of these objects
- compare numbers
- identify shapes
- compose shapes
- describe measurable attributes of multiple objects / directly compare two objects with a measurable attribute in common