Mathematics Concepts and Skills Checklists by Grade Level (Grades K-8)

2009

Response to Intervention
RtI TLC
Teaching Learning Connections
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Mathematics Concepts and Skills Checklists by Grade Level (Grades K-8)

2009
Bureau of Exceptional Education and Student Services

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Introduction
Mathematics Concepts and Skills Checklists by Grade Level (Grades K-8)

This document contains major mathematics concepts and skills involved in Grade K-8 based on big ideas and supporting ideas identified by Florida Next Generation Sunshine State Standards (NGSSS), which can be found at: http://www.floridastandards.org/index.aspx. This website contains important details and examples related to each standard and related benchmarks. The present checklist is meant to compliment the NGSSS materials. It is not a substitute for the benchmarks themselves.

In this document, after a big idea or supporting idea, each entry contains the following information:

- Description of the benchmarks as presented in the NGSSS Website, possible prerequisites for some benchmarks, and/or suggested subparts for some benchmarks are provided.
  - As appropriate, the author of this document provided some recommended prerequisites for some of the benchmarks, and/or divided some of the benchmarks in subparts; other interpretations, prerequisites, subparts or additions might be possible.
- The benchmark classification system includes the following areas, involving numbers and letters:
  - The letters in the first two positions of the benchmark code identify the Subject Area for the specific benchmark. In this case, the subject area for all the benchmarks is MA, which stands for Mathematics.
  - The number or letter in the third position represents the Grade Level for which the benchmark belongs. In this document, only grades K (Kindergarten), 1, 2, 3, 4, 5, 6, 7, and 8 were included.
  - The character or letters in the fourth position represents Body of Knowledge. In Grades K–8 Mathematics, the bodies of knowledge are Algebra (A), Geometry and Measurement (G), Data Analysis and Probability (P) and Statistics (S).
  - The number in the fifth position represents the Big Idea or Supporting Idea to which the benchmark belongs (as provided by the NGSSS Website).
  - The number in the sixth position represents the specific Benchmark under a given grade-level Big Idea. For example, in MA.5.A.1.4, the Subject Area is Mathematics, Grade Level 5, Body of Knowledge Algebra, Big Idea 1, and Benchmark 4 under Big Idea 1. Note that in Grades 3–8, Number and Operations are included within the Algebra Body of Knowledge.

- Possible prerequisite for a benchmark (also given in parentheses as “PR for …”), and/or possible subparts of a benchmark (given in parentheses as “Part of …”) are provided for some specific entries.
- Depth of Knowledge (DOK) rating (Low, Moderate or High level of complexity as provided in the NGSSS Website) is given for benchmarks or suggested subparts of benchmarks. This information is not provided for suggested prerequisites. To facilitate diagnosis and remediation, the author of this checklist added suggested subparts and prerequisites for some benchmarks. Please refer to the NGSSS Website (http://www.floridastandards.org/Standards/FLStandardSearch.aspx) for more information regarding the definition for depth of understanding. They are provided in the checklist to facilitate its use.
- The General Content Limits and Benchmark Content Limits for grades 3–8 described in this document come from the FCAT Mathematics Test Item Specifications, Grades 3–5 and Grades 6–8 released by the Florida Department of Education (FLDOE). They are applicable to all items developed for Grade 3–8; however, according to the FLDOE, the content limits defined in the individual benchmark specifications can take the place of these general content limits.
  - FCAT Mathematics tests will field test items written to the new Specifications (released in 2009 for grades 3–6, and 6–8) in 2010, and use these items for the FCAT Operational administration in 2011.
  - The General Content Limits provided within the FCAT Specifications in the area of mathematics define the range of content knowledge and degree of difficulty that should be assessed for the benchmark. According to the FLDOE, the Benchmark Content Limits define the range of content knowledge and degree of difficulty that should be assessed in the items for the benchmark. They are to be used in conjunction with the General Content Limits identified for each grade level in the Specifications. The content limits defined in the individual Benchmark Specifications may be an expansion or further restriction of the General Content Limits by Grade Level specified earlier in the Specifications.
These documents also identified the possible prior knowledge from previous grades benchmarks. The previous grade benchmarks needed for a specific benchmark (starting with grade 3) were also added to the checklist together with the Content Limit for that benchmark. For more detailed information of these documents visit FCAT–FLDOE website (http://fcat.fldoe.org/fcatis01.asp). For example,

Prior Knowledge for MA.3.A.1.1 includes MA.1.A.1.1.

Based on the benchmark’s prior knowledge, the benchmarks considered Prior Knowledge for specific subsequent benchmarks (starting with Kindergarten up to grade 8) were also identified in this document. For example, Prior Knowledge for MA.3.A.1.1 includes MA.1.A.1.1, then:

MA.1.A.1.1 is Considered Prior Knowledge for MA.3.A.1.1.

Furthermore, each of the tables in the checklist contain the following areas:

- **Representation**: This entry indicates the possible cognitive levels (concrete, pictorial or abstract) provided for performance. A checkmark is used to indicate when the concrete, pictorial or abstract level is recommended for students’ performance within a concept or skill. The concrete level involves the use of manipulatives or other objects as instructional tools. The pictorial (also known as representational) level involves the use of pictures or drawings to facilitate students’ learning. Finally, the abstract level involves the use of words or symbols to represent ideas.

- **Validation**: This entry indicates the type of validation (or response) the students could provide during a learning or assessment activity. A checkmark is used to indicate when “say/write” or “do” is recommended as students’ validation. For example, the student might be asked to say or write how many counters are included in a set of objects or, the students might be asked to validate understanding by doing something (for example, the students are asked to show a set with seven objects in it). In this case, the students will need to perform the specific task of counting objects and show a given quantity.

- **Mastery**: This space is provided to indicate if the students have demonstrated mastery or non-mastery of the skill or concept after proper instruction or assessment. Possible informal or formal sources of evidence are observations, exams, quizzes, experiments, project-based activities, rubrics, games, reports, pre- or post-tests, interviews, presentations, and other assessment or learning activities. The teacher would need to decide what form this evidence might take.

- **Retention**: This space is provided to indicate if students have demonstrated retention or non retention of the skill or concept sometime after the initial instruction or assessment. Similar sources of evidence used to assess mastery may be used to assess retention of ideas. The teacher would need to decide what form this evidence might take.
## Kindergarten Mathematics Concepts and Skills Checklist

**Note:** PR = Prerequisite, DOK = Depth of Knowledge (Low, Moderate or High as provided in the FL-Next Generation SSS).

<table>
<thead>
<tr>
<th>Skill/Concept</th>
<th>Representation</th>
<th>Validation</th>
<th>Mastery</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Concrete</td>
<td>Pictorial</td>
<td>Abstract</td>
<td>Say/Write</td>
</tr>
</tbody>
</table>

### BIG IDEA 1: Represent, compare, and order whole numbers and join and separate sets.

**MA.K.A.1.1:** Represent quantities with numbers up to 20, verbally, in writing, and with manipulatives.

1. **Rote count from 1 to a given number (at least to 20) (PR for MA.K.A.1.1)**
   
<table>
<thead>
<tr>
<th>Representation</th>
<th>Validation</th>
<th>Mastery</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

2. **Use one-to-one correspondence (one number name for each object) (PR for MA.K.A.1.1)**
   
<table>
<thead>
<tr>
<th>Representation</th>
<th>Validation</th>
<th>Mastery</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

3. **Count rationally (meaningfully) from 1 to a given number (up to 20) (PR for MA.K.A.1.1)**
   
<table>
<thead>
<tr>
<th>Representation</th>
<th>Validation</th>
<th>Mastery</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>

4. **Represent quantities with numbers up to 20 verbally (Part A of MA.K.A.1.1) DOK: Moderate**
   
<table>
<thead>
<tr>
<th>Representation</th>
<th>Validation</th>
<th>Mastery</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

5. **Represent quantities with numbers up to 20 in writing (Part B of MA.K.A.1.1) DOK: Moderate**
   
<table>
<thead>
<tr>
<th>Representation</th>
<th>Validation</th>
<th>Mastery</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

6. **Represent quantities with numbers up to 20 with manipulatives (Part C of MA.K.A.1.1) DOK: Moderate**
   
<table>
<thead>
<tr>
<th>Representation</th>
<th>Validation</th>
<th>Mastery</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

**MA.K.A.1.2:** Solve problems including those involving sets by counting, by using cardinal and ordinal numbers, by comparing, by ordering, and by creating sets up to 20.

7. **Use ordinal numbers (first, …, last) (PR for MA.K.A.1.2)**
   
<table>
<thead>
<tr>
<th>Representation</th>
<th>Validation</th>
<th>Mastery</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>

8. **Compare two quantities (no numerals) (PR for MA.K.A.1.2)**
   
<table>
<thead>
<tr>
<th>Representation</th>
<th>Validation</th>
<th>Mastery</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

9. **Make two sets equal (no numerals) (PR for MA.K.A.1.2)**
   
<table>
<thead>
<tr>
<th>Representation</th>
<th>Validation</th>
<th>Mastery</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

10. **Match sets to numerals (PR for MA.K.A.1.2)**
    
    | Representation | Validation | Mastery | Retention |
    |----------------|------------|---------|-----------|
    |                | x          |         | x         |

11. **Use appropriate language such as none, more than, fewer than, same number of, and one more than (PR for MA.K.A.1.2)**
    
    | Representation | Validation | Mastery | Retention |
    |----------------|------------|---------|-----------|
    |                | x          | x       | x         |

12. **Solve problems involving sets by counting up to 20 (Part A of MA.K.A.1.2) DOK: Moderate**
    
    | Representation | Validation | Mastery | Retention |
    |----------------|------------|---------|-----------|
    |                | x          | x       | x         |

13. **Solve problems involving sets by using cardinal and ordinal numbers up to 20 (Part B of MA.K.A.1.2) DOK: Moderate**
    
    | Representation | Validation | Mastery | Retention |
    |----------------|------------|---------|-----------|
    |                | x          | x       | x         |

14. **Solve problems involving sets by comparing sets up to 20 (Part C of MA.K.A.1.2) DOK: Moderate**
    
    | Representation | Validation | Mastery | Retention |
    |----------------|------------|---------|-----------|
    |                | x          | x       | x         |

15. **Solve problems involving sets by ordering sets up to 20 (Part D of MA.K.A.1.2) DOK: Moderate**
    
    | Representation | Validation | Mastery | Retention |
    |----------------|------------|---------|-----------|
    |                | x          | x       | x         |

16. **Solve problems involving sets by creating sets up to 20 (Part E of MA.K.A.1.2) DOK: Moderate**
    
    | Representation | Validation | Mastery | Retention |
    |----------------|------------|---------|-----------|
    |                | x          | x       | x         |
### Kindergarten Mathematics Concepts and Skills Checklist Cont. ...

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<thead>
<tr>
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<th>Validation</th>
<th>Mastery</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Concrete</td>
<td>Pictorial</td>
<td>Abstract</td>
<td>Say/Write</td>
</tr>
</tbody>
</table>

**BIG IDEA 1: Represent, compare, and order whole numbers and join and separate sets. Cont. …**

MA.K.A.1.3: Solve word problems involving simple joining and separating situations.

| 17. Make a set with more or less (no numerals) (PR for MA.K.A.1.3) | x | x | x | x |
| 18. Solve word problems involving simple joining situations *(Part A of MA.K.A.1.3)* DOK: High | x | x | x | x | x |
| 19. Solve word problems involving separating situations *(Part B of MA.K.A.1.3)* DOK: High | x | x | x | x | x |

**BIG IDEA 2: Describe shapes and space.**

MA.K.G.2.1: Describe, sort and re-sort objects using a variety of attributes such as shape, size, and position.


| 1. Use appropriate language to indicate relative positions of objects in space such as beside, inside, outside, next to, above, and below (PR for MA.K.G.2.1) | x | x | x |
| 2. Describe objects using a variety of attributes such as shape, size, and position *(Part A of MA.K.G.2.1)* DOK: Moderate | x | x | x |
| 3. Sort objects using a variety of attributes such as shape, size, and position *(Part B of MA.K.G.2.2)* DOK: Moderate | x | x | x | x |
| 4. Re-sort objects using a variety of attributes such as shape, size, and position *(Part C of MA.K.G.2.2)* DOK: Moderate | x | x | x | x |

MA.K.G.2.2: Identify, name, describe and sort basic two-dimensional shapes such as squares, triangles, circles, rectangles, hexagons, and trapezoids.

MA.K.G.2.2 is Considered Prior Knowledge for MA.3.G.5.1, and MA.3.G.5.2.

| 5. Identify basic 2-dimensional shapes such as squares, triangles, circles, rectangles, hexagons, and trapezoids [include only regular hexagons and isosceles trapezoids] *(Part A of MA.K.G.2.2)* DOK: Moderate | x | x | x | x |
| 6. Name basic 2-dimensional shapes such as squares, triangles, circles, rectangles, hexagons, and trapezoids *(Part B of MA.K.G.2.2)* DOK: Moderate | x | x | x | x |
| 7. Describe basic 2-dimensional shapes such as squares, triangles, circles, rectangles, hexagons, and trapezoids *(Part C of MA.K.G.2.2)* DOK: Moderate | x | x | x | x | x |
### Kindergarten Mathematics Concepts and Skills Checklist Cont. . . .

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<td>Pictorial</td>
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<td>Say/Write</td>
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<td><strong>BIG IDEA 2: Describe shapes and space. MA.K.G.2.2 Cont. ...</strong></td>
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<tr>
<td>8. Sort basic 2-dimensional shapes such as squares, triangles, circles,</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>rectangles, hexagons, and trapezoids (Part D of MA.K.G.2.2) DOK: Moderate</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MA.K.G.2.3: Identify, name, describe, and sort three-dimensional shapes</strong></td>
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<tr>
<td>such as spheres, cubes and cylinders.</td>
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<tr>
<td><strong>MA.K.G.2.3 is Considered Prior Knowledge</strong> for MA.3.G.5.1, and MA.3.G.5.2.</td>
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<tr>
<td>9. Identify basic 3-dimensional shapes such as spheres, cubes, and</td>
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<td></td>
</tr>
<tr>
<td>cylinders (Part A of MA.K.G.2.3) DOK: Moderate</td>
<td>x</td>
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<tr>
<td>10. Name basic 3-dimensional shapes such as spheres, cubes, and</td>
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<tr>
<td>cylinders (Part B of MA.K.G.2.3) DOK: Moderate</td>
<td>x</td>
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<tr>
<td>11. Describe basic 3-dimensional shapes such as spheres, cubes,</td>
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<td></td>
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<tr>
<td>and cylinders (Part C of MA.K.G.2.3) DOK: Moderate</td>
<td>x</td>
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<tr>
<td>12. Sort basic 3-dimensional shapes such as spheres, cubes,</td>
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<td></td>
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<tr>
<td>and cylinders (Part D of MA.K.G.2.3) DOK: Moderate</td>
<td>x</td>
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</tr>
<tr>
<td><strong>MA.K.G.2.4: Interpret the physical world with geometric shapes,</strong></td>
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<td></td>
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<tr>
<td>and describe it with corresponding vocabulary. (MA.K.G.2.4) DOK: Moderate</td>
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<tr>
<td>13. Interpret the physical world with geometric shapes and describe</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>it with corresponding vocabulary (MA.K.G.2.4) DOK: Moderate</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MA.K.G.2.5: Use basic shapes,</strong> spatial reasoning,** and manipulatives**</td>
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</tr>
<tr>
<td>to model objects in the environment and to construct more complex shapes.</td>
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</tr>
<tr>
<td><strong>MA.K.G.2.5 is Considered Prior Knowledge</strong> for MA.3.G.3.1, MA.3.G.3.2,</td>
<td></td>
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<tr>
<td>14. Use basic shapes, spatial reasoning &amp; manipulatives to model objects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>in environment (Part A of MA.K.G.2.5) DOK: Moderate</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Use basic shapes, spatial reasoning, and manipulatives to construct</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>more complex shapes (Part B of MA.K.G.2.5) DOK: Moderate</td>
<td>x</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>BIG IDEA 3: Order objects by measurable attributes.</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>MA.K.G.3.1: Compare and order objects indirectly or directly using</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>measurable attributes such as length, height, and weight.</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1. Use vocabulary properly: more, fewer, most, fewest (PR for MA.K.G.3.1)</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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*Note:* PR = Prerequisite, DOK = Depth of Knowledge (Low, Moderate or High as provided in the FL-Next Generation SSS).
BIG IDEA 3: Order objects by measurable attributes. MA.K.G.3.1 Cont. …

<table>
<thead>
<tr>
<th>Skill/Concept</th>
<th>Representation</th>
<th>Validation</th>
<th>Mastery</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Compare objects indirectly or directly using measurable attributes: length (small-large, short-shorter, long-longer, far-farther) (Part A of MA.K.G.3.1)</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Compare objects indirectly or directly using measurable attributes: height (short-tall, tall-taller, short-shorter) (Part B of MA.K.G.3.1)</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Compare objects indirectly or directly using measurable attributes: weight (light-heavy, light-lighter, heavy-heavier) (Part C of MA.K.G.3.1)</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Order objects indirectly or directly using measurable attributes: length (Part D of MA.K.G.3.1)</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Order objects indirectly or directly using measurable attributes: height (Part E of MA.K.G.3.1)</td>
<td>x</td>
<td>x</td>
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<tr>
<td>7. Order objects indirectly or directly using measurable attributes: weight (Part F of MA.K.G.3.1)</td>
<td>x</td>
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</table>

SUPPORTING IDEA 4: Algebra

MA.K.A.4.1: Identify and duplicate simple number and non-numeric repeating and growing patterns.

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<tr>
<th>Skill/Concept</th>
<th>Representation</th>
<th>Validation</th>
<th>Mastery</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identify simple number repeating and growing patterns [including shape, size and color, sounds, physical movement, and two attributes at a time] (Part A of MA.K.A.4.1)</td>
<td>x</td>
<td>x</td>
<td></td>
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<tr>
<td>2. Duplicate simple number repeating and growing patterns [including shape, size and color, sounds, physical movement, and two attributes at a time] (Part B of MA.K.A.4.1)</td>
<td>x</td>
<td>x</td>
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<tr>
<td>3. Identify simple non-numeric repeating and growing patterns [including shape, size and color, sounds, physical movement, and two attributes at a time] (Part C of MA.K.A.4.1)</td>
<td>x</td>
<td>x</td>
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<tr>
<td>4. Duplicate simple non-numeric repeating and growing patterns [including shape, size and color, sounds, physical movement, and two attributes at a time] (Part D of MA.K.A.4.1)</td>
<td>x</td>
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</table>
### Kindergarten Mathematics Concepts and Skills Checklist Cont. . . .

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### SUPPORTING IDEA 5: Geometry and Measurement

**MA.K.G.5.1:** Demonstrate an understanding of the concept of time using identifiers such as morning, afternoon, day, week, month, year, before/after, shorter/longer.

**MA.K.G.5.1 is Considered Prior Knowledge for MA.3.G.5.3.**

1. Demonstrate an understanding of the concept of time using identifiers such as morning, afternoon, day, week, month, year, before/after, shorter/longer (MA.K.G.5.1) DOK: Moderate

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<td>x</td>
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First Grade Mathematics Concepts and Skills Checklist

**Note:** PR = Prerequisite, DOK = Depth of Knowledge (Low, Moderate or High as provided in the FL-Next Generation SSS).

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</table>

**BIG IDEA 1: Develop understandings of addition and subtraction strategies for basic addition facts and related subtraction facts.**

**MA.1.A.1.1:** Model addition and subtraction situations using the concepts of "part-whole," "adding to," "taking away from," "comparing," and missing addend."

**MA.1.A.1.1 is Considered Prior Knowledge for MA.3.A.1.1.**

1. Rote count from 1 to a given number (to 100) (PR for MA.1.A.1.1, MA.1.A.1.2) 
   x x
2. Model addition situations using the concept of "part-whole" (Part A of MA.1.A.1.1) DOK: Moderate 
   x x x x
3. Model addition situations using the concept of "adding to" (Part B of MA.1.A.1.1) DOK: Moderate 
   x x x x
4. Model subtraction situations using the concept of "taking away from" (Part C of MA.1.A.1.1) DOK: Moderate 
   x x x x
5. Model subtraction situations using the concept of "comparing" (Part D of MA.1.A.1.1) DOK: Moderate 
   x x x x
6. Model subtraction situations using the concept of "missing addend" (Part E of MA.1.A.1.1) DOK: Moderate 
   x x x x

**MA.1.A.1.2:** Identify, describe, and apply addition and subtraction as inverse operations.


7. Identify, describe, and apply addition and subtraction as inverse operations (MA.1.A.1.2) DOK: Moderate 
   x x x x

**MA.1.A.1.3:** Create and use increasingly sophisticated strategies, and use properties such as Commutative, Associative and Additive Identity, to add whole numbers.

**MA.1.A.1.3 is Considered Prior Knowledge for MA.3.A.1.1, MA.3.A.1.2, and MA.6.A.3.5.**

8. Create and use increasingly sophisticated strategies to add whole numbers (Part A of MA.1.A.1.3) DOK: Moderate 
   x x x x
9. Use properties such as Commutative, Associative and Additive Identity, to add whole numbers (Part of B MA.1.A.1.3) DOK: Moderate 
   x x x x
### BIG IDEA 1: Develop understandings of addition and subtraction strategies for basic addition facts and related subtraction facts. Cont. …

**MA.1.A.1.4:** Use counting strategies, number patterns, and models as a means for solving basic addition and subtraction fact problems.

10. Use counting strategies, number patterns and models as means to solve basic addition fact problems ([Part A of MA.1.A.1.4](#)) DOK: High

<table>
<thead>
<tr>
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</table>

11. Use counting strategies, number patterns & models as means to solve basic subtraction fact problems ([Part B of MA.1.A.1.4](#)) DOK: High

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### BIG IDEA 2: Develop an understanding of whole number relationships, including grouping by tens and ones.

**MA.1.A.2.1:** Compare and order whole numbers at least to 100.


1. Rote count from a given number (not 1) to another given number (PR for MA.1.A.2.1) x x

2. Rote skip count by 2s (PR for MA.1.A.2.1, MA.1.A.4.1) x x

3. Count backwards (PR for MA.1.A.2.1) x x

4. Use one-to-one correspondence (one number name for each object to 100) (PR for MA.1.A.2.1) x x

5. Count rationally (meaningfully) to 100 (make a set to match a number) (PR for MA.1.A.2.1) x x

6. Use place value through 100 (tens and ones) (PR for MA.1.A.2.1) x x x x x

7. Compare two numbers given verbally (no numerals, up to 100) (PR for MA.1.A.2.1) x x x x

8. Recognize and names numerals (at least to 100) (PR for MA.1.A.2.1) x x

9. Compare whole numbers (with numerals, at least to 100) ([Part A of MA.1.A.2.1](#)) DOK: Moderate x x x x x

10. Order whole numbers (with numerals, at least to 100) ([Part B of MA.1.A.2.1](#)) DOK: Moderate x x x x x

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<tr>
<td>MA.1.A.2.2: Represent two digit numbers in terms of tens and ones.</td>
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<tr>
<td>MA.1.A.2.3: Order counting numbers, compare their relative magnitudes, and represent numbers on a number line.</td>
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<tr>
<td>MA.1.G.3.1: Use appropriate vocabulary to compare shapes according to attributes and properties such as number and lengths of sides and number of vertices.</td>
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<tr>
<td>MA.1.G.3.2: Compose and decompose plane and solid figures, including making predictions about them, to build an understanding of part-whole relationships and properties of shapes.</td>
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### BIG IDEA 2: Develop an understanding of whole number relationships, including grouping by tens and ones. Cont. …

**MA.1.A.2.2** is Considered Prior Knowledge for MA.3.A.6.1.

11. Represent two digit numbers in terms of tens and ones (MA.1.A.2.2) DOK: Low

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**MA.1.A.2.3** is Considered Prior Knowledge for MA.3.A.6.1.

12. Make a number with more or less (with numerals, up to 100) (PR for MA.1.A.2.3)

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13. Use vocabulary properly: greater, greatest, smaller, and smallest (PR for MA.1.A.2.3)

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14. Order counting numbers (Part A of MA.1.A.2.3) DOK: Moderate

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15. Compare the relative magnitudes of counting numbers (Part B of MA.1.A.2.3) DOK: Moderate

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16. Represent numbers on a number line (Part C of MA.1.A.2.3) DOK: Moderate

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**BIG IDEA 3: Compose and decompose two-dimensional and three-dimensional shapes.**


1. Use appropriate vocabulary to compare shapes according to attributes and properties such as number and lengths of sides, and number of vertices (MA.1.G.3.1) DOK: Moderate

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2. Compose and decompose plane figures, including making predictions about them, to build an understanding of part-whole relationships and properties of shapes (Part A of MA.1.G.3.2) DOK: High

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3. Compose and decompose solid figures, including making predictions about them, to build an understanding of part-whole relationships and properties of shapes (Part B of MA.1.G.3.2) DOK: High

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**SUPPORTING IDEA 4: Algebra**

**MA.1.A.4.1:** Extend repeating and growing patterns, fill in missing terms, and justify reasoning.

*MA.1.A.4.1 is Considered Prior Knowledge for MA.3.A.4.1.*

1. Extend repeating and growing patterns, and justify reasoning *(Part A of MA.1.A.4.1)*
   - DOK: High
   - Concrete: x
   - Pictorial: x
   - Abstract: x
   - Say/Write: x
   - Do: x

2. Fill in missing terms, and justify reasoning *(Part B of MA.1.A.4.1)*
   - DOK: High
   - Concrete: x
   - Pictorial: x
   - Abstract: x

**SUPPORTING IDEA 5: Geometry and Measurement**

**MA.1.G.5.1:** Measure by using iterations of a unit, and count the unit measures by grouping units.

1. Measure by using iterations of a unit and count the unit measures by grouping units *(MA.1.G.5.1)*
   - DOK: Moderate
   - Concrete: x
   - Pictorial: x
   - Abstract: x

**MA.1.G.5.2:** Compare and order objects according to descriptors of length, weight, and capacity.

2. Compare and order objects according to descriptions of length *(Part A of MA.1.G.5.2)*
   - DOK: Moderate
   - Concrete: x

3. Compare and order objects according to descriptions of weight *(Part B of MA.1.G.5.2)*
   - DOK: Moderate
   - Concrete: x

4. Compare and order objects according to descriptions of capacity *(Part C of MA.1.G.5.2)*
   - DOK: Moderate
   - Concrete: x

**SUPPORTING IDEA 6: Number and Operations**

**MA.1.A.6.1:** Use mathematical reasoning and beginning understanding of tens and ones, including the use of invented strategies, to solve two-digit addition and subtraction problems.


1. Use mathematical reasoning and beginning understanding of tens and ones, including the use of invented strategies, to solve two-digit addition problems *(Part A of MA.1.A.6.1)*
   - DOK: High
   - Concrete: x
   - Pictorial: x
   - Abstract: x
   - Say/Write: x
   - Do: x
   - Mastery: Yes
   - Retention: No

2. Use mathematical reasoning and beginning understanding of tens and ones, including the use of invented strategies, to solve two-digit subtraction problems *(Part B of MA.1.A.6.1)*
   - DOK: High
   - Concrete: x
   - Pictorial: x
   - Abstract: x
   - Say/Write: x
   - Do: x
   - Mastery: Yes
   - Retention: No
SUPPORTING IDEA 6: Number and Operations. Cont. ...

MA.1.A.6.2: Solve routine and non-routine problems by acting them out, using manipulatives, and drawing diagrams.


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<tr>
<td>3. Solve routine problems by acting them out using manipulative (Part A of MA.1.A.6.2) DOK: High</td>
<td>x</td>
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<td>x</td>
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<tr>
<td>4. Solve routine problems by drawing diagrams (Part B of MA.1.A.6.2) DOK: High</td>
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<td>x</td>
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<td>x</td>
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<tr>
<td>5. Solve non-routine problems by acting them out using manipulative (Part C of MA.1.A.6.2) DOK: High</td>
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<tr>
<td>6. Solve non-routine problems by drawing diagrams (Part D of MA.1.A.6.2) DOK: High</td>
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## Second Grade Mathematics Concepts and Skills Checklist

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### BIG IDEA 1: Develop an understanding of base-ten numerations system and place-value concepts.

**MA.2.A.1.1:** Identify relationships between the digits and their place values through the thousands, including counting by tens and hundreds.

**MA.2.A.1.1 is Considered Prior Knowledge for MA.4.A.6.1.**

1. Identify relationships between the digits and their place value through the thousands, including counting by tens and hundreds (MA.2.A.1.1) DOK: Moderate

   - Concrete: x
   - Pictorial: x
   - Abstract: x
   - Say/Write: x
   - Do: x
   - Yes: Yes
   - No: No

### MA.2.A.1.2: Identify and name numbers through thousands in terms of place value, and apply this knowledge to expanded notation.

**MA.2.A.1.2 is Considered Prior Knowledge for MA.4.A.6.1.**

2. Identify numbers through thousands in terms of place value and apply this knowledge to expanded notation (Part A of MA.2.A.1.2) DOK: Low

   - Concrete: x
   - Pictorial: x
   - Abstract: x
   - Say/Write: x
   - Do: x
   - Yes: Yes
   - No: No

3. Name numbers through thousands in terms of place value (Part B of MA.2.A.1.2) DOK: Low

   - Concrete: x
   - Pictorial: x
   - Abstract: x
   - Say/Write: x
   - Do: x
   - Yes: Yes
   - No: No

4. Apply knowledge of numbers through thousands in terms of place value to expanded notation (Part C of MA.2.A.1.2) DOK: Low

   - Concrete: x
   - Pictorial: x
   - Abstract: x
   - Say/Write: x
   - Do: x
   - Yes: Yes
   - No: No

### MA.2.A.1.3: Compare and order multi-digit numbers through the thousands.

**MA.2.A.1.3 is Considered Prior Knowledge for MA.4.A.6.1.**

5. Make a number with more or less (with or without numerals, through the thousands) (PR for MA.2.A.1.3)

   - Concrete: x
   - Pictorial: x
   - Abstract: x
   - Say/Write: x
   - Do: x
   - Yes: Yes
   - No: No

6. Compare two numbers given verbally (with or without numerals, through the thousands) (PR for MA.2.A.1.3)

   - Concrete: x
   - Pictorial: x
   - Abstract: x
   - Say/Write: x
   - Do: x
   - Yes: Yes
   - No: No

7. Make two sets equal (with or without numerals, through the thousands) (PR for MA.2.A.1.3)

   - Concrete: x
   - Pictorial: x
   - Abstract: x
   - Say/Write: x
   - Do: x
   - Yes: Yes
   - No: No

8. Use vocabulary properly: more, fewer, most, fewest, one more, one less) (PR for MA.2.A.1.3)

   - Concrete: x
   - Pictorial: x
   - Abstract: x
   - Say/Write: x
   - Do: x
   - Yes: Yes
   - No: No

9. Compare and order multi-digit numbers through the thousands (MA.2.A.1.3) DOK: Moderate

   - Concrete: x
   - Pictorial: x
   - Abstract: x
   - Say/Write: x
   - Do: x
   - Yes: Yes
   - No: No
### Second Grade Mathematics Concepts and Skills Checklist Cont.

<table>
<thead>
<tr>
<th>Skill/Concept</th>
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<th>Validation</th>
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<tr>
<td></td>
<td>Concrete</td>
<td>Pictorial</td>
<td>Abstract</td>
<td>Say/Write</td>
</tr>
</tbody>
</table>

**BIG IDEA 2: Develop quick recall of addition facts and related subtraction facts and fluency with multi-digit addition and subtraction**

**MA.2.A.2.1: Recall basic addition and related subtraction facts.**


1. Recall basic addition facts (sums to 18) (Part A of MA.2.A.2.1) DOK: Low
   - Concrete: x
   - Pictorial: x

2. Recall basic subtraction facts (related to sums to 18) (Part B of MA.2.A.2.1) DOK: Low
   - Concrete: x
   - Pictorial: x

**MA.2.A.2.2: Add and subtract multi-digit whole numbers through three digits with fluency by using a variety of strategies, including invented and standard algorithms and explanations of those procedures.**


3. Add multi-digit whole numbers through three digits with fluency by using a variety of strategies, including invented standard algorithms and explanations of those procedures (Part A of MA.2.A.2.2) DOK: Moderate
   - Concrete: x
   - Pictorial: x
   - Abstract: x
   - Say/Write: x

4. Subtract multi-digit whole numbers through three digits with fluency by using a variety of strategies, including invented standard algorithms and explanations of procedures (Part B of MA.2.A.2.2) DOK: Moderate
   - Concrete: x
   - Pictorial: x
   - Abstract: x
   - Say/Write: x

**MA.2.A.2.3: Estimate solutions to multi-digit addition and subtraction problems through three digits.**

MA.2.A.2.3 is Considered Prior Knowledge for MA.3.A.6.1.

5. Estimate solutions to multi-digit addition problems, through three digits (Part A of MA.2.A.2.3) DOK: Moderate
   - Concrete: x
   - Pictorial: x

6. Estimate solutions to multi-digit subtraction problems, through three digits (Part B of MA.2.A.2.3) DOK: Moderate
   - Concrete: x
   - Pictorial: x

**MA.2.A.2.4: Solve addition and subtraction problems that involve measurement and geometry.**

7. Solve addition problems that involve measurement (Part A of MA.2.A.2.4) DOK: High
   - Concrete: x
   - Pictorial: x
   - Abstract: x

8. Solve addition problems that involve geometry (Part B of MA.2.A.2.4) DOK: High
   - Concrete: x
   - Pictorial: x

9. Solve subtraction problems that involve measurement (Part C of MA.2.A.2.4) DOK: High
   - Concrete: x
   - Pictorial: x

10. Solve subtraction problems that involve geometry (Part D of MA.2.A.2.4) DOK: High
    - Concrete: x
<table>
<thead>
<tr>
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<td></td>
<td>Concrete</td>
<td>Pictorial</td>
<td>Abstract</td>
<td>Say/Write</td>
</tr>
<tr>
<td>BIG IDEA 3: Develop an understanding of linear measurement and facility in measuring lengths.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>MA.2.G.3.1: Estimate and use standard units, including inches and centimeters, to partition and measure lengths of objects.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Estimate lengths of objects using inches (Part A of MA.2.G.3.1) DOK: Moderate</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>2. Partition and measure lengths of objects using inches (Part B of MA.2.G.3.1) DOK: Moderate</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>3. Estimate lengths of objects using centimeters (Part C of MA.2.G.3.1) DOK: Moderate</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>4. Partition and measure lengths of objects using centimeters (Part D of MA.2.G.3.1) DOK: Moderate</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>MA.2.G.3.2: Describe the inverse relationship between the size of a unit and number of units needed to measure a given object.</td>
<td></td>
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</tr>
<tr>
<td>5. Describe the inverse relationship between the size of a unit and number of units needed to measure a given objects (MA.2.G.3.2) DOK: Moderate</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>MA.2.G.3.3: Apply the Transitive Property when comparing lengths of objects.</td>
<td></td>
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<tr>
<td>6. Apply the Transitive Property when comparing lengths of objects (MA.2.G.3.3) DOK: Moderate</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>MA.2.G.3.4: Estimate, select an appropriate tool, measure, and/or compute lengths to solve problems.</td>
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</tr>
<tr>
<td>7. Estimate, select an appropriate tool, measure, and/or compute lengths to solve problems (MA.2.G.3.4) DOK: High</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>
**Note:** PR = Prerequisite, DOK = Depth of Knowledge (Low, Moderate or High as provided in the FL-Next Generation SSS).

### Second Grade Mathematics Concepts and Skills Checklist Cont. . . .

<table>
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<tbody>
<tr>
<td>Concrete</td>
<td>Pictorial</td>
<td>Abstract</td>
<td>Say/Write</td>
<td>Do</td>
</tr>
</tbody>
</table>

**SUPPORTING IDEA 4: Algebra**

**MA.2.A.4.1:** Extend number patterns to build a foundation for understanding multiples and factors – for example, skip counting by 2’s, 5’s, 10’s.


1. **Match one, two or three attribute patterns (PR for MA.2.A.4.1)**  
   - Concrete: x  
   - Pictorial: x  
   - Abstract: x  
   - Say/Write: x  
   - Do: x

2. **Extend one, two or three attribute patterns (PR for MA.2.A.4.1)**  
   - Concrete: x  
   - Pictorial: x  
   - Abstract: x  
   - Say/Write: x  
   - Do: x

3. **Translate one, two and three attribute patterns (PR for MA.2.A.4.1)**  
   - Concrete: x  
   - Pictorial: x  
   - Abstract: x  
   - Say/Write: x  
   - Do: x

4. **Create one, two or three attribute patterns (PR for MA.2.A.4.1)**  
   - Concrete: x  
   - Pictorial: x  
   - Abstract: x  
   - Say/Write: x  
   - Do: x

5. **Rote skip count by 5s (PR for MA.2.A.4.1)**  
   - Concrete: x  
   - Pictorial: x  
   - Abstract: x  
   - Say/Write: x  
   - Do: x

6. **Rote skip count by 10s (PR for MA.2.A.4.1)**  
   - Concrete: x  
   - Pictorial: x  
   - Abstract: x  
   - Say/Write: x  
   - Do: x

7. **Skip count rationally by 2s (PR for MA.2.A.4.1)**  
   - Concrete: x  
   - Pictorial: x  
   - Abstract: x  
   - Say/Write: x  
   - Do: x

8. **Skip count rationally by 5s (PR for MA.2.A.4.1)**  
   - Concrete: x  
   - Pictorial: x  
   - Abstract: x  
   - Say/Write: x  
   - Do: x

9. **Skip count rationally by 10s (PR for MA.2.A.4.1)**  
   - Concrete: x  
   - Pictorial: x  
   - Abstract: x  
   - Say/Write: x  
   - Do: x

10. **Extend number patterns to build a foundation for understanding multiples and factors – for example, skip counting by 2’s, 5’s, 10’s (MA.2.A.4.1) DOK: Moderate**

**MA.2.A.4.2:** Classify numbers as odd or even and explain why.


11. **Classify numbers as even or odd and explains why (MA.2.A.4.2) DOK: Moderate**  
    - Concrete: x  
    - Pictorial: x  
    - Abstract: x  
    - Say/Write: x  
    - Do: x

**MA.2.A.4.3:** Generalize numeric and non-numeric patterns using words and tables.


12. **Generalize numeric patterns using words and tables (Part A of MA.2.A.4.3) DOK: High**  
    - Concrete: x  
    - Pictorial: x  
    - Abstract: x  
    - Say/Write: x  
    - Do: x

13. **Generalize non-numeric patterns using words and tables (Part B of MA.2.A.4.3) DOK: High**  
    - Concrete: x  
    - Pictorial: x  
    - Abstract: x  
    - Say/Write: x  
    - Do: x
**SUPPORTING IDEA 4: Algebra Cont. …**

MA.2.A.4.4: Describe and apply equality to solve problems, such as in balancing situations.

<table>
<thead>
<tr>
<th>Skill/Concept</th>
<th>Concrete</th>
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<th>Abstract</th>
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<th>Mastery</th>
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<tr>
<td>MA.2.A.4.4</td>
<td>x x x</td>
<td></td>
<td></td>
<td>x x</td>
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</table>

MA.2.A.4.5: Recognize and state rules for functions that use addition and subtraction.

<table>
<thead>
<tr>
<th>Skill/Concept</th>
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<th>Abstract</th>
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<th>Retention</th>
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</thead>
<tbody>
<tr>
<td>MA.2.A.4.5</td>
<td>x x x</td>
<td></td>
<td></td>
<td>x x</td>
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</tbody>
</table>

**SUPPORTING IDEA 5: Geometry and Measurement**

MA.2.G.5.1: Use geometric models to demonstrate the relationships between wholes and their parts as a foundation to fractions.

<table>
<thead>
<tr>
<th>Skill/Concept</th>
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<th>Pictorial</th>
<th>Abstract</th>
<th>Say/Write</th>
<th>Mastery</th>
<th>Retention</th>
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<tbody>
<tr>
<td>MA.2.G.5.1</td>
<td>x x</td>
<td></td>
<td></td>
<td>x x</td>
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</table>

MA.2.G.5.2: Identify time to the nearest hour and half hour.

<table>
<thead>
<tr>
<th>Skill/Concept</th>
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<th>Abstract</th>
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<th>Mastery</th>
<th>Retention</th>
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<tbody>
<tr>
<td>MA.2.G.5.2</td>
<td>x x</td>
<td></td>
<td></td>
<td>x x</td>
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<td></td>
</tr>
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</table>

MA.2.G.5.3: Identify, combine, and compare values of money in cents up to $1 and in dollars up to $100, working with a single unit of currency.

<table>
<thead>
<tr>
<th>Skill/Concept</th>
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<th>Pictorial</th>
<th>Abstract</th>
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<th>Mastery</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA.2.G.5.3</td>
<td>x x</td>
<td></td>
<td></td>
<td>x x</td>
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</tbody>
</table>
### Second Grade Mathematics Concepts and Skills Checklist Cont. . . .

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<td>Abstract</td>
<td>Say/Write</td>
</tr>
<tr>
<td><strong>SUPPORTING IDEA 5: Geometry and Measurement. MA.2.G.5.3 Cont. . . .</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>7. Identify values of money in cents up to $1, working with a single unit of currency (Part A of MA.2.G.5.3 DOK: Moderate)</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>8. Combine values of money in cents up to $1, working with a single unit of currency (Part B of MA.2.G.5.3 DOK: Moderate)</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>9. Compare values of money in cents up to $1, working with a single unit of currency (Part C of MA.2.G.5.3 DOK: Moderate)</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>10. Identify values of money in dollars up to $100, working with a single unit of currency (Part D of MA.2.G.5.3 DOK: Moderate)</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>11. Combine values of money in dollars up to $100, working with a single unit of currency (Part E of MA.2.G.5.3 DOK: Moderate)</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>12. Compare values of money in dollars up to $100, working with a single unit of currency (Part F of MA.2.G.5.3 DOK: Moderate)</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>

**MA.2.G.5.4: Measure weight/mass and capacity/volume of objects. Include the use of the appropriate unit of measure and their abbreviations including cups, pints, quarts, gallons, ounces (oz), pounds (lbs), grams (g), kilograms (kg), milliliters (mL) and liters (L).**

**MA.2.G.5.4 is Considered Prior Knowledge for MA.5.G.5.2 and MA.5.G.5.3.**

<table>
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<tr>
<td></td>
<td>Concrete</td>
<td>Pictorial</td>
<td>Abstract</td>
<td>Say/Write</td>
</tr>
<tr>
<td>13. Measure weight/mass of objects using appropriate unit of measure and their abbreviations including ounces (oz), pounds (lbs) (Part A of MA.2.G.5.4 DOK: Low)</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>14. Measure weight/mass of objects using appropriate unit of measure and their abbreviations including grams (g), kilograms (kg) (Part B of MA.2.G.5.4 DOK: Low)</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>15. Measure capacity/volume of objects using appropriate unit of measure and their abbreviations including cups, pints, quarts, gallons (Part C of MA.2.G.5.4 DOK: Low)</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>16. Measure capacity/volume of objects using appropriate unit of measure and their abbreviations including milliliters (mL) and liters (L) (Part D of MA.2.G.5.4 DOK: Low)</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
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</tbody>
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**Note:** PR = Prerequisite, DOK = Depth of Knowledge (Low, Moderate or High as provided in the FL-Next Generation SSS).

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</tbody>
</table>

**SUPPORTING IDEA 6: Number and Operations**

**MA.2.A.6.1:** Solve problems that involve repeated addition.


1. Solve problems that involve repeated addition (**MA.2.A.6.1**) DOK: Moderate

<table>
<thead>
<tr>
<th></th>
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<th>X</th>
</tr>
</thead>
</table>
## Third Grade Mathematics Concepts and Skills Checklist

### BIG IDEA 1: Develop understanding of multiplication and division strategies for multiplication facts and related division facts.

**General Content Limits related to Big Idea 1:**
- Whole number multiplication items may include whole-number multiplication facts from 0 x 0 through 9 x 9.
- Whole number multiplication items may include multiples of 10 through 100, multiples of 100 through 1,000, and multiples of 50 through 500.
- Whole number division items may include the related division facts for 0 x 0 through 9 x 9.

### MA.3.A.1.1: Model multiplication and division including problems presented in context: repeated addition, multiplicative comparison, array, how many combinations, measurement, and partitioning.

**Content Limits for MA.3.A.1.1:**
- Items may include whole-number multiplication facts from 0 x 0 through 9 x 9 and the related division facts, and division problems with remainders expressed only as whole numbers.
- Items will not require interpretation of the remainder.


<table>
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<tr>
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<th>Retention</th>
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<tr>
<td></td>
<td>Concrete</td>
<td>Pictorial</td>
<td>Abstract</td>
<td>Say/Write</td>
</tr>
<tr>
<td>3. Model multiplication including problems presented in context: repeated addition (Part A of MA.3.A.1.1) DOK: Moderate</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>4. Model multiplication including problems presented in context: multiplicative comparison (Part B of MA.3.A.1.1) DOK: Moderate</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>5. Model multiplication including problems presented in context: array (Part C of MA.3.A.1.1) DOK: Moderate</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>6. Model multiplication including problems presented in context: how many combinations (Part D of MA.3.A.1.1) DOK: Moderate</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>7. Model division including problems presented in context: measurement division (Part E of MA.3.A.1.1) DOK: Moderate</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>8. Model division including problems presented in context: partitioning division (Part F of MA.3.A.1.1) DOK: Moderate</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

**MA.3.A.1.2: Solve multiplication and division fact problems by using strategies that result from applying number properties.

**Content Limits for MA.3.A.1.2:**
- Items will not include identifying the properties by name, or
- Items will not require the use of more than two properties to convert one expression or equation to its equivalent.
- Items may include only factors or divisors of 0 through 9.

**Prior Knowledge for MA.3.A.1.2 includes** MA.1.A.1.3.


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<tbody>
<tr>
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<td></td>
</tr>
<tr>
<td>9. Solve multiplication fact problems by using strategies that result from applying number properties (Part A of MA.3.A.1.2) DOK: High</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### BIG IDEA 1: Develop understanding of multiplication and division strategies for multiplication facts and related division facts. MA.3.A.1.2 Cont.

10. Solve division fact problems by using strategies that result from applying number properties (Part B of MA.3.A.1.2) DOK: High |
<table>
<thead>
<tr>
<th>Concrete</th>
<th>Pictorial</th>
<th>Abstract</th>
<th>Say/Write</th>
<th>Do</th>
<th>Mastery</th>
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<tr>
<td>x</td>
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</tbody>
</table>

**MA.3.A.1.3:** Identify, describe, and apply division and multiplication as inverse operations.

*Content Limits for MA.3.A.1.3:*
- Items may include whole-number multiplication facts from 0 x 0 through 9 x 9 and the related division facts.
- Items will not include identifying the inverse property by name.


11. Identify, describe, and apply division and multiplication as inverse operations (MA.3.A.1.3) DOK: Moderate |
<table>
<thead>
<tr>
<th>Concrete</th>
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### BIG IDEA 2: Develop an understanding of fractions and fraction equivalence.

**General Content Limits related to Big Idea 2:**
- Decimal numbers items are limited to amounts of money to the nearest cent.
- Fractions items should have denominators of 1–10, 12, or 16.
- Items may include fractions and mixed numbers up to and including the whole number 5.
- Percent is not assessed at Grade 3.

**Content Limits for MA.3.A.2.1:**
- Area models may include shapes such as circles and rectangles.
- Set models may include groups of objects such as counters or other objects familiar to Grade 3 students.
- Linear models may include number lines and fraction strips.
- Items may include fractions and mixed numbers up to and including the whole number 5.
- Items may include fractions with denominators from 1 through 10, 12, or 16.

*Prior Knowledge for MA.3.A.2.1 includes* MA.2.G.5.1.

**MA.3.A.2.1:** Represent fractions, including fractions greater than one, using area, set, and linear models.


1. Represent fractions, including fractions greater than one, using area models (Part A of MA.3.A.2.1) DOK: Moderate |
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<tr>
<th>Concrete</th>
<th>Pictorial</th>
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2. Represent fractions, including fractions greater than one, using set models (Part B of MA.3.A.2.1) DOK: Moderate |
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3. Represent fractions, including fractions greater than one, using linear models (Part C of MA.3.A.2.1) DOK: Moderate |
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**Note:** PR = Prerequisite, DOK = Depth of Knowledge (Low, Moderate or High as provided in the FL-Next Generation SSS).

### Third Grade Mathematics Concepts and Skills Checklist Cont. . . .

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**BIG IDEA 2: Develop an understanding of fractions and fraction equivalence. Cont. …**

**MA.3.A.2.2: Describe how the size of the fractional part is related to the number of equal sized pieces in the whole.**


4. Describe how the size of the fractional part is related to the number of equal sized pieces in the whole (MA.3.A.2.2) DOK: Moderate

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Content Limits for MA.3.A.2.3:
- Denominators of fractions must be 1 through 10, 12, or 16.
- Items may include fractions and mixed numbers up to and including the whole number 5.
- Items may include only the inequality symbols, < and >.

Prior Knowledge for MA.3.A.2.3 includes MA.2.G.5.1.

**MA.3.A.2.3: Compare and order fractions, including fractions greater than one, using models and strategies.**


5. Compare fractions, including fractions greater than one, using models and strategies (Part A of MA.3.A.2.3) DOK: Moderate

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6. Order fractions, including fractions greater than one, using models and strategies (Part B of MA.3.A.2.3) DOK: Moderate

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Content Limits for MA.3.A.2.4:
- Denominators of fractions must be 1 through 10, 12, or 16.
- Items may include fractions and mixed numbers up to and including the whole number 5.

Prior Knowledge for MA.3.A.2.4 includes MA.2.G.5.1.

**MA.3.A.2.4: Use models to represent equivalent fractions, including fractions greater than 1, and identify representations of equivalence.**


7. Use models to represent equivalent fractions, including fractions greater than 1 (Part A of MA.3.A.2.4) DOK: Moderate

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8. Identify representations of equivalence (Part B of MA.3.A.2.4) DOK: Moderate

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### BIG IDEA 3: Describe and analyze properties of two-dimensional shapes.

**MA.3.G.3.1:** Describe, analyze, compare, and classify two-dimensional shapes using sides and angles - including acute, obtuse, and right angles - and connect these ideas to the definition of shapes.

**Content Limits for MA.3.G.3.1:**
- Items may include regular and irregular polygons with 3, 4, 5, 6, 8, or 10 sides.
- Polygons used in items may be concave or convex.
- Polygons used in items may include types of triangles (right, equilateral, isosceles, and scalene), types of quadrilaterals (parallelogram, trapezoid, rectangle, rhombus, square, and/or kite), pentagons, hexagons, octagons, and decagons.
- Polygons may be classified by use of parallel or perpendicular sides as well as number of sides and/or types of angles.
- Items may assess the specific names of polygons with 3, 4, 5, 6, 8, or 10 sides and the following terms: regular and irregular polygons, lines and line segments (parallel and perpendicular), diagonals, and vertices (vertex).
- Items will not include defining or identifying the following vocabulary terms: concave and convex.
- Types of angles will not be assessed in isolation at this benchmark.


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1. **Describe two-dimensional shapes using sides and angles - including acute, obtuse, and right angles (Part A of MA.3.G.3.1) DOK: Moderate**
   - x x x

2. **Analyze two-dimensional shapes using sides and angles - including acute, obtuse, and right angles (Part B of MA.3.G.3.1) DOK: Moderate**
   - x x x

3. **Compare two-dimensional shapes using sides and angles - including acute, obtuse, and right angles (Part C of MA.3.G.3.1) DOK: Moderate**
   - x x x

4. **Classify two-dimensional shapes using sides and angles - including acute, obtuse, and right angles (Part D of MA.3.G.3.1) DOK: Moderate**
   - x x x x

5. **Connect the ideas two-dimensional shapes using sides and angles - including acute, obtuse, and right angles - to the definition of shapes (Part E of MA.3.G.3.1) DOK: Moderate**
   - x x
### BIG IDEA 3: Describe and analyze properties of two-dimensional shapes Cont. …

**MA.3.G.3.2:** Compose, decompose, and transform polygons to make other polygons, including concave and convex polygons with three, four, five, six, eight, or ten sides.

#### Content Limits for MA.3.G.3.2:
- Items may include concave or convex polygons with 3, 4, 5, 6, 8, or 10 sides.
- Items may include the use of transformations to create new polygons, but the transformation (i.e., rotations, translations, reflections, dilations) will not be assessed.
- Geometric terms will be used with common terminology set in parentheses, i.e., reflection (flip).
- Items may use the following terms: overlapping, combine, and polygon.
- Items will not assess the following vocabulary terms: concave, convex, compose, or decompose.


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<td><strong>MA.3.G.3.2</strong></td>
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<tr>
<td><strong>6.</strong> Compose, decompose, and transform polygons to make other polygons, including concave and convex polygons with three, four, five, six, eight, or ten sides</td>
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**MA.3.G.3.3:** Build, draw, and analyze two-dimensional shapes from several orientations in order to examine and apply congruence and symmetry.

#### Content Limits for MA.3.G.3.3:
- Items may include concave and convex polygons with 3, 4, 5, 6, 8, or 10 sides.
- Items should use the correct geometric term with common terminology set in parentheses, i.e., reflection (flip).
- Items may assess the following terms: symmetry, reflection, and/or congruent.
- Transformations may be used in graphics; however, the transformations needed to compose or decompose polygons (rotations, translations, dilations) will not be assessed.


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<tr>
<td><strong>7.</strong> Build two-dimensional shapes from several orientations in order to examine and apply congruence and symmetry (Part A of MA.3.G.3.3)</td>
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<td><strong>8.</strong> Draw two-dimensional shapes from several orientations in order to examine and apply congruence and symmetry (Part B of MA.3.G.3.3)</td>
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<td><strong>9.</strong> Analyze two-dimensional shapes from several orientations in order to examine and apply congruence and symmetry (Part C of MA.3.G.3.3)</td>
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### Third Grade Mathematics Concepts and Skills Checklist Cont. . . .

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**SUPPORTING IDEA 4: Algebra**

**MA.3.A.4.1:** Create, analyze, and represent patterns and relationships using words, variables, tables, and graphs.


**Content Limits for MA.3.A.4.1:**
- Items may use numeric patterns, graphic patterns, function tables, or graphs (bar graphs, pictographs, or line plots only).
- Numeric patterns should be shown with three or more elements.
- Graphic patterns should be shown with at least three examples of the pattern repeated.
- Students should not be asked to extend the pattern more than three steps beyond what is given or to provide more than three missing elements.
- Items will not include extending the pattern on a bar graph or pictograph.
- Rules for numeric patterns and relationships shown in function tables must include only one operation limited to addition, subtraction, or multiplication. When the operation of multiplication is used, the rule is limited to the multiplication facts of 0 x 0 through 9 x 9.
- Function rules or relationships may be described using words, tables, graphs, or expressions using variables or geometric shapes (e.g., n., Δ); however, the intent of the benchmark is not to assess solving equations.

**Prior Knowledge for MA.3.A.4.1 includes MA.1.A.4.1, and MA.2.A.4.1–MA.2.A.4.5.**

1. Use variables (x, y, z, a, b, or others) to represent unknown quantities, whole numbers (PR for MA.3.A.4.1) | x | x |

2. Use variables to represent unknowns in expressions or equations (PR for MA.3.A.4.1) | x | x | x |

3. Use the same value for the same variable in equations (sums up to 18): x + y = 4, y = 2; or z + 0 = z (PR for MA.3.A.4.1) | x | x | x | x |

4. Use the same or different values for different variables in equations (one, or two): y + y = 4 and y = 2; x + y = 3, x = 1 and y = 2; or x + y + z = 3, x, y and z = 1 (PR for MA.3.A.4.1) | x | x | x | x |

5. Use algebraic expressions to translate verbal ideas; for example, "add 5 to another number and the sum is 7" can translated as "5 + y = 7", or write an algebraic expression to represent a given situation: weight of a box plus five, and three years less than a certain age as w + 5 (PR for MA.3.A.4.1) | x | x |

6. Create, analyze, and represent patterns and relationships using words, variables, tables and graphs (MA.3.A.4.1) DOK: High | x | x | x | x | x |
### Third Grade Mathematics Concepts and Skills Checklist Cont.

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#### SUPPORTING IDEA 5: Geometry and Measurement

General Content Limits related to SUPPORTING IDEA 5: Geometry and Measurement:
- Measurement items will not assess weight/mass, capacity, or temperature in isolation.
- Time and linear measurement, including perimeter, will be assessed.
- Items may use customary and/or metric units.

**MA.3.G.5.1: Select appropriate units, strategies, and tools to solve problems involving perimeter.**

**Content Limits for MA.3.G.5.1:**
- Items may require the student to use properties of polygons to deduce the lengths of a side or sides of a polygon given the perimeter and/or the lengths of the remaining sides of the polygon.
- Polygons used in items must be convex with 3, 4, 5, 6, 8, or 10 sides or composed of composite rectangles.
- Items may require students to measure the sides of a polygon using a ruler.
- The lengths of the sides of polygons must be whole numbers.
- Items will not include conversions between units of measure.


1. Select appropriate units, strategies and tools to solve problems involving perimeter (MA.3.G.5.1) DOK: High
   - x
   - x
   - x
   - x
   - x

**MA.3.G.5.2: Measure objects using fractional parts of linear units such as 1/2, 1/4, and 1/10.**

**Content Limits for MA.3.G.5.2:**
- Items will require students to measure objects using a ruler.
- Measurements will be less than 6 inches or 15 centimeters.
- Items will not include conversions between units.


**MA.3.G.5.2 is Considered Prior Knowledge for MA.5.G.5.3.**

2. Measure objects using fractional parts of linear units such as 1/2, 1/4, and 1/10 (MA.3.G.5.2) DOK: Low
   - x
   - x
   - x
   - x
   - x

**MA.3.G.5.3: Tell time to the nearest minute and to the nearest quarter hour, and determine the amount of time elapsed.**

**Content Limits for MA.3.G.5.3:**
- Items may include determining elapsed time of days, weeks, months, or years.
- For elapsed time greater than 1 hour and less than or equal to 24 hours, only increments of hours and half hours will be assessed.
- For elapsed time less than 1 hour, only increments of quarter hours and 5 minutes will be assessed.

**Prior Knowledge for MA.3.G.5.3 includes MA.K.G.5.1 and MA.2.G.5.2.**

**MA.3.G.5.3 is Considered Prior Knowledge for MA.5.G.5.2.**

3. Tell time to the nearest minute (Part A of MA.3.G.5.3) DOK: Moderate
   - x
   - x
   - x

4. Tell time to the nearest quarter hour (Part B of MA.3.G.5.3) DOK: Moderate
   - x
   - x
   - x
   - x

5. Determine the amount of time elapsed to the nearest minute (Part C of MA.3.G.5.3) DOK: Moderate
   - x
   - x
   - x

6. Determine the amount of time elapsed nearest quarter hour (Part D of MA.3.G.5.3) DOK: Moderate
   - x
   - x
   - x
   - x
   - x

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Note: PR = Prerequisite, DOK = Depth of Knowledge (Low, Moderate or High as provided in the FL-Next Generation SSS).
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<tr>
<td><strong>SUPPORTING IDEA 6: Number and Operations</strong></td>
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<td><strong>General Content Limits related to SUPPORTING IDEA 6: Number and Operations:</strong></td>
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<td>● Whole numbers items should not require more than two operations.</td>
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<td>● Whole number place values should range from ones through hundred thousands.</td>
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<td>● Whole number addition items should not exceed three 5-digit addends or two 6-digit addends.</td>
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<td>● Whole number subtraction items subtrahends cannot exceed 999,999.</td>
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<td>● Whole number subtraction items minuends and differences should not exceed five digits.</td>
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<td>● Decimal numbers items are limited to amounts of money to the nearest cent.</td>
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<td>● Decimal number addition, subtraction, multiplication, and division are not assessed at Grade 3.</td>
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<td>● Fraction addition, subtraction, multiplication, and division are not assessed at Grade 3.</td>
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<td>● Percent is not assessed at Grade 3.</td>
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| **MA.3.A.6.1:** Represent, compute, estimate, and solve problems using numbers through hundred thousands. |
| **Content Limits for MA.3.A.6.1:** |
| ● Numbers may be represented flexibly; for example: 947 can be thought of as 9 hundreds, 4 tens, and 7 ones; 94 tens and 7 ones; or 8 hundreds, 14 tens, and 7 ones. |
| ● Items may include the inequality symbols (> , <, = , ≠). |
| ● Students will not be expected to name the estimation strategies or be restricted to using a specific strategy. |
| ● Front-end estimation will not be an acceptable estimation strategy. |
| ● Decimals may be used in the context of money that estimates to a whole dollar. |


1. Count rationally (meaningfully) through hundreds (makes a set to match a number) (PR for MA.3.A.6.1) x x x
2. Use place value through hundred thousands (PR for MA.3.A.6.1) x x
3. Recognize and name numerals (at least through hundred thousands) (PR for MA.3.A.6.1) x x
4. Estimate solutions to problems using numbers through hundred thousands prior to written calculations (PR for MA.3.A.6.1) x x
5. Represent, compute, estimate and solve problems using numbers through hundred thousands (MA.3.A.6.1) DOK: High x x x x x

**MA.3.A.6.2:** Solve non-routine problems by making a table, chart, or list and searching for patterns. |

**Content Limits for MA.3.A.6.2:**

● Items should require students to solve nonroutine problems and not align with the clarifications of MA.3.A.4.1 (extending a graphic pattern or identifying a simple relationship [rule] for a pattern). |


**MA.3.A.6.2 is Considered Prior Knowledge for MA.5.A.6.5.**

6. Solve non-routine problems by making a table, chart, or list and searching for patterns (MA.3.A.6.2) DOK: High x x x x x
<table>
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<tr>
<td><strong>SUPPORTING IDEA 7: Data Analysis</strong></td>
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<td><strong>MA.3.S.7.1:</strong> Construct and analyze frequency tables, bar graphs, pictographs, and line plots from data, including data collected through observations, surveys, and experiments.</td>
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Content Limits for MA.3.S.7.1:
- Items may require the student to choose the most appropriate data display given a set of data from observations, surveys, and/or experiments.
- Items may assess identifying parts of a correct graph and recognizing the appropriate scale.
- The increments used on the scale are limited to units of 1, 2, 5, 10, 50, or 100.
- Pictographs can use keys containing a scale of 1, 2, 5, or 10.
- The data presented in graphs should represent no more than five categories.
- The total sample size for bar graphs should be no more than 1,000.
- The total sample size should be no more than 200 for frequency tables, pictographs, and line plots.
- Addition, subtraction, or multiplication of whole numbers may be used within the item.


1. **Construct frequency tables from data, including data collected through observations, surveys, and experiments (Part A of MA.3.S.7.1)** DOK: High
   |   | x | x | x |   | x | x |

2. **Analyze frequency tables from data, including data collected through observations, surveys, and experiments (Part B of MA.3.S.7.1)** DOK: High
   |   | x | x | x |   | x | x |

3. **Constructs bar graphs from data, including data collected through observations, surveys, and experiments (Part C of MA.3.S.7.1)** DOK: High
   |   | x | x | x |   | x | x |

4. **Analyzes bar graphs from data, including data collected through observations, surveys, and experiments (Part D of MA.3.S.7.1)** DOK: High
   |   | x | x | x |   | x | x |

5. **Constructs pictographs from data, including data collected through observations, surveys, and experiments (Part E of MA.3.S.7.1)** DOK: High
   |   | x | x | x |   | x | x |

6. **Analyzes pictographs from data, including data collected through observations, surveys, and experiments (Part of F MA.3.S.7.1)** DPK: High
   |   | x | x | x |   | x | x |

7. **Constructs line plots from data, including data collected through observations, surveys, and experiments (Part of G MA.3.S.7.1)** DOK: High
   |   | x | x | x |   | x | x |

8. **Analyzes line plots from data, including data collected through observations, surveys, and experiments (Part H of MA.3.S.7.1)** DPK: High
   |   | x | x | x |   | x | x |
### Fourth Grade Mathematics Concepts and Skills Checklist

**Note:** PR = Prerequisite, DOK = Depth of Knowledge (Low, Moderate or High as provided in the FL-Next Generation SSS).

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**BIG IDEA 1:** Develop quick recall of multiplication facts and related division facts and fluency with whole numbers multiplication.

**General Content Limits related to Big Idea 1:**
- Factors used may include up to two 3-digit numbers, or, when a four-digit factor is used, the other factor may not exceed two digits.
- Divisors should not exceed one digit, unless it is a related division fact of 0 \( \times \) 0 through 12 \( \times \) 12.
- Dividends should not exceed three digits.
- Quotients may include remainders expressed only as whole numbers.
- Items will not require the use of long division.

**MA.4.A.1.1:** Use and describe various models for multiplication in problem-solving situations, and demonstrate recall of basic multiplication and related division facts with ease.

1. Use and describe various models for multiplication in problem-solving situations (Part A of MA.4.A.1.1) DOK: Moderate
   - Concrete: X
   - Pictorial: X
   - Abstract: X
   - Say/Write: X
   - Do: X

2. Demonstrate recall of basic multiplication facts with ease (Part B of MA.4.A.1.1) DOK: Moderate
   - Concrete: X
   - Pictorial: X

3. Demonstrate recall of division facts related to multiplication facts with ease (Part C of MA.4.A.1.1) DOK: Moderate
   - Concrete: X
   - Pictorial: X

**MA.4.A.1.2:** Multiply multi-digit whole numbers through four digits fluently, demonstrating understanding of the standard algorithm, and checking for reasonableness of results, including solving real-world problems.

**Content Limits for MA.4.A.1.2:**
- Items may include whole-number multiplication facts from 0 \( \times \) 0 through 12 \( \times \) 12 and the related division facts.
- For items that require solving multidigit multiplication problems, the two factors may not exceed three digits by three digit or four digits by two digits.
- When both factors have three digits, at least one digit must be a zero.
- Items may include finding partial products of a multidigit multiplication problem or finding errors in multiplication problems.
- Items may include checking for reasonableness of products.
- Items may use properties (e.g., commutative, associative, inverse, identity, distributive, zero) to solve problems but will not include asking students to name the specific properties.
- Also assesses MA.4.A.1.1.


4. Multiply one- or two-digit whole numbers times two-digit whole numbers fluently, demonstrating understanding of the standard algorithm, and checking for reasonableness of results, including solving real-world-problems (PR for MA.4.A.1.2)
   - Concrete: X
   - Pictorial: X
   - Abstract: X
   - Say/Write: X
   - Do: X

5. Multiply two- or three-digit whole numbers times two- or three-digit whole numbers fluently, demonstrating understanding of the standard algorithm, and checking for reasonableness of results, including solving real-world-problems (PR for MA.4.A.1.2)
   - Concrete: X
   - Pictorial: X
   - Abstract: X
   - Say/Write: X
   - Do: X
**Note:** PR = Prerequisite, DOK = Depth of Knowledge (Low, Moderate or High as provided in the FL-Next Generation SSS).

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**BIG IDEA 1: Develop quick recall of multiplication facts and related division facts and fluency with whole numbers multiplication. MA.4.A.1.2 Cont. …**

6. Multiply two-digit whole number times four-digit whole numbers fluently, demonstrating understanding of the standard algorithm, and checking for reasonableness of results, including solving real-world-problems (PR for MA.4.A.1.2)

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7. Multiply multi-digit whole numbers through four digits fluently, demonstrating understanding of the standard algorithm, and checking for reasonableness of results, including solving real-world-problems (MA.4.A.1.2) DOK: High

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**BIG IDEA 2: Develop an understanding of decimals, including the connection between fractions and decimals.**

**General Content Limits related to Big Idea 2:**
- Decimals place values could range from tenths through thousandths with no more than five total digits.
- Fraction items may have denominators of 1–10, 12, or 1000, or denominators that are derived from basic multiplication facts through 12 x 12 may also be used (e.g., 24 has the two factors 6 and 4; 72 has the factors 8 and 9).
- Items dealing with percents will not involve computation using the percent.

**MA.4.A.2.1:** Use decimals through the thousandths place to name numbers between whole numbers.

**MA.4.A.2.1 is Considered Prior Knowledge for MA.5.A.2.1, MA.5.A.2.2.**

1. Use decimals through the thousandths place to name numbers between whole numbers (MA.4.A.2.1) DOK: Low

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**MA.4.A.2.2:** Describe decimals as an extension of the base-ten number system.

**MA.4.A.2.2 is Considered Prior Knowledge for MA.5.A.2.1, and MA.5.A.2.2.**

2. Describe decimals as an extension of the base-ten number system (MA.4.A.2.2) DOK: High

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### Fourth Grade Mathematics Concepts and Skills Checklist

#### Skill/Concept

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### BIG IDEA 2: Develop an understanding of decimals, including the connection between fractions and decimals.

**MA.4.A.2.3:** Relate equivalent fractions and decimals with and without models, including locations on a number line.

**Content Limits for MA.4.A.2.3:**
- Items may include mixed numbers and/or fractions.
- Items may assess translating the following commonly used fractions or mixed numbers to decimals (or their decimal equivalents): 1/10, 1/4, 1/2, 3/4, all fifths, tenths, hundredths, and thousandths. For example, 0.2, 0.20, 0.200, and are all equivalent. Also, 0.5 = 1/2, 3/5 = 0.6, 3/2 = 1.5, or 7 1/2 = 7.5.
- Items will not require the use of division or dividing a denominator into a numerator to translate a fraction to an equivalent decimal.
- Items will not assess simplifying fractions, except for converting commonly used fractions or mixed numbers to decimals.
- When naming or identifying fractions or decimals between two consecutive whole numbers, the whole numbers may not exceed 99.
- Also assesses MA.4.A.2.1, and MA.4.A.2.2.


3. Relate equivalent fractions and decimals with models, including locations on a number line (Part A of MA.4.A.2.3) DOK: Moderate
   - x  x  x  x  x

4. Relate equivalent fractions and decimals without models (Part B of MA.4.A.2.3) DOK: Moderate
   - x  x

**MA.4.A.2.4: Compare and order decimals, and estimate fraction and decimal amounts in real-world problems.**

**Content Limits for MA.4.A.2.4:**
- Items may include fractions and mixed numbers.
- Items may include fractions with denominators of 1 through 12, 16, 20, 25, 50, 100, and 1000.
- The number of fractions being ordered or compared should not exceed five.
- The number of decimals being ordered or compared should not exceed six.
- Numbers being compared may be in the same form or in two different forms.
- Numbers being compared and ordered in two different forms should not exceed five.
- Items may include the inequality symbols ( <, ≤, >, ≥, =, or ≠).


5. Compare decimals (Part A MA.4.A.2.4) DOK: Moderate
   - x  x  x  x

6. Order decimals (Part B of MA.4.A.2.4) DOK: Moderate
   - x  x  x  x

7. Estimate fraction and decimal amounts in real-world problems (Part C of MA.4.A.2.4) DOK: Moderate
   - x  x  x  x
**Fourth Grade Mathematics Concepts and Skills Checklist Cont...**

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**BIG IDEA 3: Develop and understanding of area and determine the area of two-dimensional shapes.**

**General Content Limits related to Big Idea 3:**
- Measurement items will not assess weight/mass, time, temperature, perimeter, and/or capacity in isolation.
- Measurement items may use customary and/or metric units.

**MA.4.G.3.1:** Describe and determine area as the number of same-sized units that cover a region in the plane, recognizing that a unit square is the standard unit for measuring area.

**Content Limits for MA.4.G.3.1:**
- Items may include estimating areas of irregular geometric shapes, such as a figure in the shape of a pond, a mitten, a foot, the sole of a shoe, or a solid letter D.
- Items should include countable units that estimate to a whole unit or half unit.
- Items may use only a one-to-one scale.

**Prior Knowledge for MA.4.G.3.1 includes MA.4.A.2.4.**

**MA.4.G.3.1 is Considered Prior Knowledge for MA.5.G.3.1, MA.5.G.3.2, and MA.5.G.5.4.**

1. Describe and determine area as the number of same-sized units that cover a region in the plane, recognizing that a unit square is the standard unit for measuring area (MA.4.G.3.1 DOK: Moderate)  

2. Justify the formula for the area of the rectangle "area = base x height" (MA.4.G.3.2 DOK: Moderate)

3. Select and use appropriate customary units to estimate and solve real-world area problems (Part A of MA.4.G.3.3) DOK: Moderate

4. Select and use appropriate metric units to estimate and solve real-world area problems (Part B of MA.4.G.3.3) DOK: Moderate

5. Select and use appropriate strategies and measuring tools to estimate and solve real-world area problems (Part C of MA.4.G.3.3) DOK: Moderate
### Skill/Concept

**MA.4.A.4.1:** Generate algebraic rules and use all four operations to describe patterns, including nonnumeric growing or repeating patterns.

#### SUPPORTING IDEA 4: Algebra

**Content Limits for MA.4.A.4.1:**
- Items may include any of the four operations but will use only one operation in each numeric pattern.
- When the operations of multiplication or division are used, the rule is limited to the multiplication facts of 0 x 0 through 12 x 12 and the related division facts.
- A repeating pattern should be shown with at least three examples of the repeated pattern unless it is clearly explained in the stem of the item.

**Prior Knowledge for MA.4.A.4.1 includes MA.3.A.4.1.**

**MA.4.A.4.1 is Considered Prior Knowledge for MA.5.A.4.1, and MA.6.A.3.1.**

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1. Use variables (x, y, z, a, b, c, or others) to represent (substitute) unknown quantities (set of whole numbers) (PR for MA.4.A.4.1, MA.4.A.4.2, MA.4.A.4.3)  
2. Use variables to represent unknowns in expressions or equations (PR for MA.4.A.4.1, MA.4.A.4.2, MA.4.A.4.3)  
4. Use the same value for the same variable in equations (sums up to 18): x + y = 4, y = 2; or z + 0 = z (PR for MA.4.A.4.1, MA.4.A.4.2, MA.4.A.4.3)  
5. Use the same or different values for different variables in equations (one, two or three variables, sums up to 18): y + y = 4 and y = 2; x + y = 3, x = 1 and y = 2; or x + y + z = 3, x, y and z = 1 (PR for MA.4.A.4.1, MA.4.A.4.2, MA.4.A.4.3)  
6. Use the idea of balancing scales involving addition and missing addends, and one or two variable to represent equations, and equalities (PR for MA.4.A.4.1, MA.4.A.4.2, MA.4.A.4.3)  
7. Use the idea of missing addends and factors (one, two or three variables) (PR for MA.4.A.4.1, MA.4.A.4.2, MA.4.A.4.3)  
8. Use algebraic expressions to translate verbal ideas; for example, "add 5 to another number and the sum is 7" can translated as "5 + y = 7", or write an algebraic expression to represent a given situation: weight of a box plus five, and three years less than a certain age as w + 5 (PR for MA.4.A.4.1, MA.4.A.4.2, MA.4.A.4.3)
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#### SUPPORTING IDEA 4: Algebra. MA.4.A.4.1 Cont …

9. Solve addition equations with one or two variables: $3 + 2 = x$, $x = 5$; or $0 + 2 = a$, $a = 2$ (PR for MA.4.A.4.1, MA.4.A.4.2, MA.4.A.4.3)  
   - Concrete: x  
   - Pictorial: x  
   - Abstract: x  
   - Say/Write: x  
   - Do: x  
   - Mastery: Yes  
   - Retention: No

10. Use equations involving addition and multiplication with one or two variables: $3 + 2 = x$, $x = 5$; or $0 + 2 = a$, $a = 2$ (PR for MA.4.A.4.1, MA.4.A.4.2, MA.4.A.4.3)  
   - Concrete: x  
   - Pictorial:  
   - Abstract: x  
   - Say/Write:  
   - Do: x  
   - Mastery: No  
   - Retention: Yes

11. Use "ab" to represent "a • b" (PR for MA.4.A.4.1)  
   - Concrete:  
   - Pictorial:  
   - Abstract: x  
   - Say/Write: x  
   - Do: x  
   - Mastery: Yes  
   - Retention: No

12. Generate algebraic rules and use all four operations to describe numeric growing or repeating patterns (Part A of MA.4.A.4.1)  
   - Concrete: x  
   - Pictorial: x  
   - Abstract: x  
   - Say/Write: x  
   - Do: x  
   - Mastery: Yes  
   - Retention: No

13. Generate algebraic rules and use all four operations to describe nonnumeric growing or repeating patterns (Part B of MA.4.A.4.1)  
   - Concrete: x  
   - Pictorial: x  
   - Abstract: x  
   - Say/Write: x  
   - Do: x  
   - Mastery: Yes  
   - Retention: No

### MA.4.A.4.2: Describe mathematics relationships using expressions, equations, and visual representations.

**Content Limits for MA.4.A.4.2:**
- Items must use rules or relationships that involve only one operation or a one-step function.
- A relationship must be defined in words, or at least three examples of the relationship must be provided.
- Relationships involving multiplication or division are limited to the multiplication facts of 0 x 0 through 12 x 12 and the related division facts.
- Items may include only one variable.


14. Select the operation to solve a word problem (with variables) PR for MA.4.A.4.2)  
   - Concrete: x  
   - Pictorial:  
   - Abstract:  
   - Say/Write:  
   - Do: x  
   - Mastery: No  
   - Retention: Yes

15. Represent and analyzes patterns using words, tables, and graphs (PR for MA.4.A.4.2)  
   - Concrete: x  
   - Pictorial: x  
   - Abstract: x  
   - Say/Write: x  
   - Do: x  
   - Mastery: Yes  
   - Retention: No

16. Describe mathematics relationships using expressions, equations, and visual representations (MA.4.A.4.2) DOK: High  
   - Concrete: x  
   - Pictorial: x  
   - Abstract: x  
   - Say/Write: x  
   - Do: x  
   - Mastery: Yes  
   - Retention: No

### MA.4.A.4.3: Recognize and write algebraic expressions for functions with two operations.

**Content Limits for MA.4.A.4.3:**
- Items will use only one variable.
- A relationship must be defined in words, or at least four examples of the relationship must be provided.


17. Recognize and write algebraic expressions for functions with two operations (MA.4.A.4.3) DOK: High  
   - Concrete: x  
   - Pictorial: x  
   - Abstract: x  
   - Say/Write: x  
   - Do: x  
   - Mastery: Yes  
   - Retention: No

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Note: PR = Prerequisite, DOK = Depth of Knowledge (Low, Moderate or High as provided in the FL-Next Generation SSS).

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### SUPPORTING IDEA 5: Geometry and Measurement

**MA.4.G.5.1:** Classify angles of two-dimensional shapes using benchmark angles (45°, 90°, 180°, and 360°).

**Content Limits for MA.4.G.5.1:**
- Items may include the following vocabulary terms: ray, angle, (acute, obtuse, right, straight), and perpendicular lines.
- Items will not include the vocabulary terms: complementary, supplementary, and vertical.
- Items will not require the use of a protractor or measuring an angle to the nearest degree.
- Items may include the geometric notation for angle (°) and degrees (°).


1. Classify angles of two-dimensional shapes using benchmark angles (i.e. 45°, 90°, 180°, and 360°) *(MA.4.G.5.1)* DOK: Low

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**MA.4.G.5.2:** Identify and describe the results of translations, reflections, and rotations of 45, 90, 180, 270, and 360 degrees, including figures with line and rotational symmetry.

**Content Limits for MA.4.G.5.2:**
- For line symmetry, lines of reflection will not pass through the shape being reflected.
- For rotational symmetry, the center of rotation will be shown on the object being rotated.
- The following vocabulary terms may be used: transformation, translation, reflection, rotation, clockwise, counterclockwise, line symmetry, rotational symmetry, and center.
- Items should include no more than two transformations.


2. Identify the results of translations, reflections, and rotations of 45, 90, 180, 270, and 360 degrees, including figures with line and rotational symmetry *(Part A of MA.4.G.5.2)* DOK: Moderate

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3. Describe the results of translations, reflections, and rotations of 45, 90, 180, 270, and 360 degrees, including figures with line and rotational symmetry *(Part B of MA.4.G.5.2)* DOK: Moderate

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**MA.4.G.5.3:** Identify and build a three-dimensional object from a two-dimensional representation of that object and vice versa.

**Content Limits for MA.4.G.5.3:**
- Items may include drawings of views from the top, sides, front, or base of an object.
- Three-dimensional objects represented in items must be made from cubes.
- Items will not include or assess two-dimensional nets of three-dimensional objects.


**MA.4.G.5.3 is Considered Prior Knowledge** for MA.5.G.3.1, and MA.5.G.3.2.

4. Identify a three-dimensional object from a two-dimensional representation of that object *(Part A of MA.4.G.5.3)* DOK: Moderate

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<th>Abstract</th>
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### SUPPORTING IDEA 5: Geometry and Measurement. MA.4.G.5.3 Cont. …

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<tr>
<td>5. Identify a two-dimensional object from a three-dimensional representation of that object (Part B of MA.4.G.5.3) DOK: Moderate</td>
<td></td>
<td>x</td>
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<tr>
<td>6. Build a three-dimensional object from a two-dimensional representation of that object (Part C of MA.4.G.5.3) DOK: Moderate</td>
<td>x</td>
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<tr>
<td>7. Build a two-dimensional object from a three-dimensional representation of that object (Part D of MA.4.G.5.3) DOK: Moderate</td>
<td>x</td>
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</table>

### SUPPORTING IDEA 6: Number and Operations

#### General Content Limits related to SUPPORTING IDEA 6: Number and Operations:
- Whole numbers items should not require the use of more than two operations.
- Place values should range from ones through hundred millions.
- Addition items should not exceed three 7-digit addends or two 8-digit addends.
- Subtraction items subtrahends, minuends, and differences should not exceed eight digits.
- Decimal addition, subtraction, multiplication, and division are not assessed at Grade 4.
- Fraction addition, subtraction, multiplication, and division are not assessed at Grade 4.
- Decimals place values could range from tenths through thousandths with no more than five total digits.
- Fraction items may have denominators of 1–10, 12, or 1000, or denominators that are derived from basic multiplication facts through 12 x 12 may also be used (e.g., 24 has the two factors 6 and 4; 72 has the factors 8 and 9).
- Percents must be equivalent only to halves, fourths, tenths, or hundredths.
- Items dealing with percents will not involve computation using the percent.

#### MA.4.A.6.1: Use and represent numbers through millions in various contexts, including estimation of relative sizes of amounts or distances.

**Content Limits for MA.4.A.6.1:**
- Items may include the inequality symbols (>, <, ≤, ≥, ≠).
- Items will not include decimals or fractions.
- Items involving units of measure may not involve converting from one unit to another.
- Front-end estimation will not be an acceptable estimation strategy.


1. Use and represent numbers through millions in various contexts, including estimation of relative sizes of amounts or distances (MA.4.A.6.1) DOK: Moderate | x | x | x | x |

#### MA.4.A.6.2: Use models to represent division as: the inverse of multiplication, as partitioning, as successive subtraction.

**Content Limits for MA.4.A.6.2:**
- Items will include only whole numbers and whole-number remainders.
- Items will not require students to interpret a remainder.
- Items may assess how to translate a word problem to a multiplication or division expression or equation.
- Items will not include computing solutions to long-division problems.
- Items may be a translation from arrays, equal-sized groups, area, or visual representations.

**Prior Knowledge for MA.4.A.6.2 includes MA.3.A.1.3 and MA.3.A.6.1.**

**MA.4.A.6.2 is Considered Prior Knowledge for MA.6.A.3.5.**

2. Use a number line involving whole numbers and fractions (PR for MA.4.A.6.2) | x | x | x | x |
### Fourth Grade Mathematics Concepts and Skills Checklist Cont. . . .

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<thead>
<tr>
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<tr>
<td>3. Use models to represent division as the inverse of multiplication (Part A of MA.4.A.6.2) DOK: Moderate</td>
<td>x</td>
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<td>x</td>
</tr>
<tr>
<td>4. Use models to represent division as partitioning (Part B of MA.4.A.6.2) DOK: Moderate</td>
<td>x</td>
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</tr>
<tr>
<td>5. Use models to represent division as successive subtraction (Part C of MA.4.A.6.2) DOK: Moderate</td>
<td>x</td>
<td>x</td>
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</table>

**MA.4.A.6.3: Generate equivalent fractions and simplify fractions.**

**Content Limits for MA.4.A.6.3:**
- All common factors of the numerator and denominator must be less than or equal to 10.
- Items will not include graphical representations of fractions.

**Prior Knowledge for MA.4.A.6.3 includes MA.3.A.2.1–MA.3.A.2.4.**


| 6. Generate equivalent fractions (Part A of MA.4.A.6.3) DOK: Moderate | x | x | x | x | x |
| 7. Simplify fractions (Part B of MA.4.A.6.3) DOK: Moderate | x | x | x | x |

**MA.4.A.6.4: Determine factors and multiples for specified whole numbers.**

**Content Limits for MA.4.A.6.4:**
- Items may use the vocabulary terms factors and multiples.
- The number being factored must be less than or equal to 100.
- When multiples are assessed, the multiple number must be 1–12, 25, 50, or 100.
- Items will not include the use of factor trees or prime factorization.

**Prior Knowledge for MA.4.A.6.4 includes MA.3.A.1.1–MA.3.A.1.3.**

| 8. Determine factors and multiples for specified whole numbers (MA.4.A.6.4) DOK: Moderate | x | x | x | x | x |

**MA.4.A.6.5: Relate halves, fourths, tenths, and hundredths to decimals and percents.**

**Content Limits for MA.4.A.6.5:**
- The following fractions: 1/4, 1/2, 3/4, all tenths, and all hundredths may be converted to percents (e.g., 1/4 = 25%, or 3/4 = 75%) or vice versa.
- Items will not assess converting between fractions and decimals.
- Items will not require a student to solve a problem using decimals, fractions, or percents.
- Items may include graphic models of fractions, decimals, or percents.

**Prior Knowledge for MA.4.A.6.5 includes MA.3.A.2.1–MA.3.A.2.4.**


<p>| 9. Relate halves, fourths, tenths, and hundredths to decimals and percents (MA.4.A.6.5) DOK: Moderate | x | x | x | x | x |</p>
<table>
<thead>
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**SUPPORTING IDEA 6: Number and Operations Cont. …**

**MA.4.A.6.6:** Estimate and describe reasonableness of estimates; determine the appropriateness of an estimate versus an exact answer.

**Content Limits for MA.4.A.6.6:**
- Items may include finding numbers or ranges of numbers that are most appropriate or reasonable.
- Items will not include measurement estimates.
- Items may include visual estimates.
- Items may include numbers up to and including the hundred millions place.
- Items may include fractions or decimals that estimate to a whole number.
- Items should not require exact calculations.
- Items will not assess specific estimation strategies or rounding of numbers without estimating.
- Front-end estimation will not be an acceptable estimation strategy.

**Prior Knowledge for MA.4.A.6.6 includes MA.3.A.6.1.**


10. **Estimate and describe reasonableness of estimates (Part A of MA.4.A.6.6) DOK: High**
   - x x

11. **Determine the appropriateness of an estimate versus an exact answer (Part B of MA.4.A.6.6) DOK: High**
   - x x
**Fifth Grade Mathematics Concepts and Skills Checklist**

**Note:** PR = Prerequisite, DOK = Depth of Knowledge (Low, Moderate or High as provided in the FL-Next Generation SSS).

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**BIG IDEA 1: Develop an understanding of and fluency with division of whole numbers.**

**General Content Limits for Big Idea 1:**
- Whole number divisors should not exceed two digits.
- Whole number dividends should not exceed four digits.
- Whole number quotients may be expressed as mixed numbers or include remainders.

**MA.5.A.1.1:** Describe the process of finding quotients involving multi-digit dividends using models, place value, properties, and the relationship of division to multiplication.

**Content Limits for MA.5.A.1.1:**
- Items may include one-digit or two-digit divisors and dividends of up to four digits.
- Items will not include quotients with remainders.


1. Describe the process of finding quotients involving multi-digit dividends using models, place value, properties and the relationship of division to multiplication (MA.5.A.1.1) DOK: Moderate

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**MA.5.A.1.2:** Estimate quotients or calculate them mentally depending on the context and numbers involved.

2. Estimate quotients mentally or calculate them depending on the context and numbers involved (MA.5.A.1.2) DOK: Moderate

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<tr>
<th>Say/Write</th>
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**MA.5.A.1.3:** Interpret solutions to division situations including those with remainders depending on the context of the problem.


3. Interpret solutions to division situations including those with remainders depending on the context of the problem (MA.5.A.1.3) DOK: High

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**MA.5.A.1.4:** Divide multi-digit whole numbers fluently, including solving real-world problems, demonstrating understanding of the standard algorithm and checking the reasonableness of results.

**Content Limits for MA.5.A.1.4:**
- Divisors may have up to two digits and dividends may have up to four digits.
- Decimals in the context of money may be used only for the dividend or quotient.
- Items may require the use of two operations to solve the problem if at least one operation is division.
- Also assesses MA.5.A.1.2 and MA.5.A.1.3.


4. Divide multi-digit whole numbers fluently, including solving real-world problems demonstrating understanding of the standard algorithm and checking the reasonableness of results (MA.5.A.1.4) DOK: High

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<th>Say/Write</th>
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Note: PR = Prerequisite, DOK = Depth of Knowledge (Low, Moderate or High as provided in the FL-Next Generation SSS).

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**BIG IDEA 2: Develop an understanding of and fluency with addition and subtraction of fraction and decimals.**

**General Content Limits for Big Idea 2:**
- Decimal place values could range from tenths through thousandths.
- Decimal addition items should not require the use of more than four 4-digit addends or two 5-digit addends.
- Decimal subtraction items subtrahends, minuends, and differences should not exceed five digits.
- Fractions should have denominators of 1–12, 75, or 1000, or denominators that are derived from basic multiplication facts through 12 x 12 may also be used (e.g., 24 has the two factors 6 and 4; 72 has the factors 8 and 9).
- Fraction addition items should not require the use of more than three addends.
- Fraction items may require the use of up to two mixed numbers with unlike denominators of 2 through 12 (excluding 11).
- Fraction addition items should not require the use of more than two unlike denominators.
- Fraction subtraction items should not require the use of more than two unlike denominators.
- Fraction subtraction items subtrahends and minuends may use up to two mixed numbers with unlike denominators of 2 through 12 (excluding 11).

**MA.5.A.2.1:** Represent addition and subtraction of decimals and fractions with like and unlike denominators using models, place value, or properties.

**Content Limits for MA.5.A.2.1:**
- Items may include graphic representations of models.
- Items may include decimals through the thousandths place or in the context of money.
- Items may assess the commutative and/or associative properties.
- Denominators of fractions in the stimulus must be less than or equal to 12.
- Items may include mixed numbers and/or fractions.
- Items may include fractions represented as parts of sets (e.g., 1/2 dozen + 1/3 dozen).
- Regrouping in subtraction problems or finding a mixed number may be included.
- Items will not include more than three addends.
- Students may be required to apply concepts from MA.5.A.6.1, but this benchmark will not be assessed in isolation.


1. Represent addition of decimals using models, place value or properties (Part A of MA.5.A.2.1) DOK: Moderate
   - Concrete: x
   - Pictorial: x
   - Abstract: x
   - Say/Write: x
   - Do: x

2. Represent addition of fractions with like and unlike denominators using models, place value or properties (Part B of MA.5.A.2.1) DOK: Moderate
   - Concrete: x
   - Pictorial: x
   - Abstract: x
   - Say/Write: x
   - Do: x

3. Represent subtraction of decimals using models, place value or properties (Part C of MA.5.A.2.1) DOK: Moderate
   - Concrete: x
   - Pictorial: x
   - Abstract: x
   - Say/Write: x
   - Do: x

4. Represent subtraction fractions with like and unlike denominators using models, place value or properties (Part D of MA.5.A.2.1) DOK: Moderate
   - Concrete: x
   - Pictorial: x
   - Abstract: x
   - Say/Write: x
   - Do: x
**Fifth Grade Mathematics Concepts and Skills Checklist Cont...**

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**BIG IDEA 2: Develop an understanding of fluency with addition and subtraction of fraction and decimals.**

**MA.5.A.2.2: Add and subtract fractions and decimals fluently, and verify the reasonableness of results, including in problem situations.**

Content Limits for MA.5.A.2.2:
- Items may include up to two mixed numbers.
- Items may include up to three fractions, which may contain unlike denominators.
- Denominators of fractions may be 1–12, 14, 15, 16, 18, 21, 24, 25, 32, 35, 36, 45, 75, or any multiple of 10 through 100.
- Items may include decimals through the thousandths place or in money.
- Also assesses MA.5.A.2.3 and MA.5.A.6.1.


| 5. Add fractions fluently and verify the reasonableness of results, including in problem situations (Part A of MA.5.A.2.2) DOK: Moderate | X | X |
| 6. Add decimals fluently and verify the reasonableness of results, including in problem situations (Part B of MA.5.A.2.2) DOK: Moderate | X | X |
| 7. Subtract fractions fluently and verify the reasonableness of results, including in problem situations (Part C of MA.5.A.2.2) DOK: Moderate | X | X |
| 8. Subtract decimals fluently and verify the reasonableness of results, including in problem situations (Part D of MA.5.A.2.2) DOK: Moderate | X | X |

**MA.5.A.2.3: Make reasonable estimates of fraction and decimal sums and differences, and use techniques for rounding.**

**MA.5.A.2.3 is Considered Prior Knowledge for MA.6.A.1.3, and MA.6.A.5.3.**

| 9. Make reasonable estimates of fraction sums, and use techniques for rounding (Part A of MA.5.A.2.3) DOK: Moderate | X | X |
| 10. Make reasonable estimates of fraction differences, and use techniques for rounding (Part B of MA.5.A.2.3) DOK: Moderate | X | X |
| 11. Make reasonable estimates of decimal sums, and use techniques for rounding (Part C of MA.5.A.2.3) DOK: Moderate | X | X |
| 12. Make reasonable estimates of decimal differences, and use techniques for rounding (Part D of MA.5.A.2.3) DOK: Moderate | X | X |
**BIG IDEA 2: Develop an understanding of and fluency with addition and subtraction of fraction and decimals Cont. …**

**MA.5.A.2.4:** Determine the prime factorization of numbers.

**Content Limits for MA.5.A.2.4:**
- Expressions with a base of 2, 3, or 4 may have exponents up to 5, 4, or 3 respectively.
- Expressions with a base of 5 through 10 may be raised to the second power.
- Items will not include factoring numbers greater than 100.

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<tr>
<td>13. Determine the prime factorization of numbers (MA.5.A.2.4) DOK: Moderate</td>
<td>x</td>
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**BIG IDEA 3: Describe three-dimensional shapes and analyze their properties, including volume and surface area.**

**MA.5.G.3.1:** Analyze and compare the properties of two-dimensional figures and three-dimensional solids (polyhedra), including the number of edges, faces, vertices, and types of faces.

**Content Limits for MA.5.G.3.1:**
- Items may include the following terms: pyramid, prism, solid, face, edge, vertex, net, right, polyhedron, and vocabulary from previous grades.
- Items will not include assessing properties of two-dimensional figures in isolation; items must include a three-dimensional figure.
- Polyhedra used in items must be prisms or pyramids with bases having no more than eight sides or composite three-dimensional figures constructed from only cubes.
- Items dealing with composite three-dimensional solids will not require students to determine the number of edges, sides, or faces; however, they may be asked to identify different views of the solid or the number of cubes used to build the solid.
- Items will not assess vocabulary or properties of oblique polyhedrons, spheres, cones, or cylinders.


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<tr>
<td>1. Analyze and compare the properties of two-dimensional figures and three-dimensional solids (polyhedra), including the number of edges, faces, vertices, and types of faces (MA.5.G.3.1) DOK: High</td>
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**MA.5.G.3.2:** Describe, define, and determine surface area and volume of prisms by using appropriate units and selecting strategies and tools.

**Content Limits for MA.5.G.3.2:**
- Dimensions of prisms must be whole numbers no larger than 12, and the surface area or calculated volume must be less than 1000.
- Items will not include volume and surface areas of nonrectangular prisms (e.g., triangular prisms).
- Items involving surface area must include a net or a graphic of the assessed three-dimensional shape.


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<td>Concrete</td>
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<tr>
<td>2. Describe, define and determine surface area of prisms by using appropriate units and selecting strategies and tools (Part A of MA.5.G.3.2) DOK: High</td>
<td>x</td>
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<td>x</td>
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<tr>
<td>3. Describe, define and determine volume of prisms by using appropriate units and selecting strategies and tools (Part B of MA.5.G.3.2) DOK: High</td>
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**Skill/Concept** | **Representation** | **Validation** | **Mastery** | **Retention**
---|---|---|---|---
Concrete | Pictorial | Abstract | Say/Write | Do | Yes | No | Yes | No

### SUPPORTING IDEA 4: Algebra

**MA.5.A.4.1:** Use the properties of equality to solve numerical and real world situations.

Content Limits for MA.5.A.4.1:
- Problems may involve equalities that have no more than two operations.
- Properties of equality may include substituting a quantity of equal value for another quantity within a situation.
- Equations may have up to two variables. When a two-variable equation is given in the stem, the value of one of the variables must be provided. (Students are not expected to solve for two variables.)
- Coefficients of variables must be whole numbers.
- Multiplication will be shown by use of parentheses or a multiplication sign (the dot or x).
- Items will not include naming the property of equality.
- Numbers used in situations and their solutions must be whole numbers less than or equal to 150.


1. Use the properties of equality to solve numerical and real world situations (MA.5.A.4.1) DOK: Moderate

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### SUPPORTING IDEA 5: Geometry and Measurement

**MA.5.G.5.1:** Identify and plot ordered pairs on the first quadrant of the coordinate plane.

Content Limits for MA.5.G.5.1:
- Items may include the following terms: coordinates, coordinate plane, ordered pairs, midpoint, x-axis and y-axis, but items will not assess the vocabulary of these terms.

1. Identify ordered pairs on the first quadrant of the coordinate plane (Part A of MA.5.G.5.1) DOK: Low

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2. Plot ordered pairs on the first quadrant of the coordinate plane (Part B of MA.5.G.5.1) DOK: Low

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### SUPPORTING IDEA 5: Geometry and Measurement Cont. …

#### MA.5.G.5.2: Compare, contrast, and convert units of measure within the same dimension (length, mass, or time) to solve problems.

**Content Limits for MA.5.G.5.2:**
- Items may include linear measure, weight/mass, time, or elapsed time (to the nearest minute).
- Items will not include time zones.
- Items may include either analog or digital clocks but not both within the same item.
- Items will not include the use of proportions or equivalent ratios to convert between different measurement systems.
- Items may include up to two conversions within the same system of measurement.
- Items may include multiplying or dividing by multiples of ten.
- Items may require students to add and subtract measurements.


3. Compare, contrast, and convert units of measure within the same dimension of length, to solve problems *(Part A of MA.5.G.5.2)* DOK: Moderate

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4. Compare, contrast, and convert units of measure within the dimension of mass to solve problems *(Part B of MA.5.G.5.2)* DOK: Moderate

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5. Compare, contrast, and convert units of measure within the same dimension of time to solve problems *(Part C of MA.5.G.5.2)* DOK: Moderate

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#### MA.5.G.5.3: Solve problems requiring attention to approximation, selection of appropriate measuring tools, and precision of measurement.

**Content Limits for MA.5.G.5.3:**
- Linear measures in inches may be to the nearest 1/16 inch.
- Items may include measurement tools such as: scales, rulers, yardsticks, tape measures, meter sticks, measuring cups, analog and digital clocks, thermometers, and their related units of measure. For a complete list of units for items involving measurement, see the Grade 5 Reference Sheet located in Appendix H of the FCAT Specifications Math Grades 3-5 document.
- Items dealing with length should focus on precision, not on the tool used to measure length.
- Metric measures of mass may be to the nearest milligram.
- Linear metric measures may be to the nearest millimeter.
- Capacity metric measures may be to the nearest milliliter.
- Elapsed time may be to the nearest minute.

6. Solve problems requiring attention to approximation of measures, selection of appropriate measuring tools, and precision of measurement *(MA.5.G.5.3)* DOK: High

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### Fifth Grade Mathematics Concepts and Skills Checklist Cont. . . .

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**SUPPORTING IDEA 5: Geometry and Measurement Cont. …**

MA.5.G.5.4: Derive & apply formulas for areas of parallelograms, triangles, & trapezoids from the area of a rectangle.

- **Content Limits for MA.5.G.5.4:**
  - Items assessing areas of trapezoids must use only isosceles trapezoids.
  - Areas must include whole numbers with three or fewer significant digits and up to a maximum of five digits.


1. Derive formula for area of parallelograms from the area of a rectangle **(Part A of MA.5.G.5.4)** DOK: High
   - Concrete: X
   - Pictorial: X
   - Abstract: X
   - Say/Write: X
   - Do: X

2. Derive formula for area of triangles from the area of a rectangle **(Part B of MA.5.G.5.4)** DOK: High
   - Concrete: X
   - Pictorial: X
   - Abstract: X
   - Say/Write: X
   - Do: X

3. Derive formula for area of trapezoids from the area of a rectangle **(Part C of MA.5.G.5.4)** DOK: High
   - Concrete: X
   - Pictorial: X
   - Abstract: X
   - Say/Write: X
   - Do: X

4. Apply formula for area of parallelograms **(Part D of MA.5.G.5.4)** DOK: High
   - Concrete: X
   - Pictorial: X

5. Apply formula for area of triangles **(Part E of MA.5.G.5.4)** DOK: High
   - Concrete: X
   - Pictorial: X

6. Apply formulas for area of trapezoids **(Part F of MA.5.G.5.4)** DOK: High
   - Concrete: X
   - Pictorial: X

**SUPPORTING IDEA 6: Number and Operations**

General Content Limits related to SUPPORTING IDEA 6: Number and Operations:

- Whole number items should not require the use of more than three operations.
- Integers may range from -500 through 999,999,999.
- Whole number items should not exceed four addends.
- Whole number items should not exceed four 4-digit addends, three 5-digit addends, or two 6-digit addends.
- Whole number subtraction items subtrahends, minuends, and differences should not exceed six digits.
- Whole number multiplication factors can have up to three digits by three digits or four digits by two digits and could include a 0 in the hundreds, tens, and/or ones places.
- Decimal multiplication is limited to the context of money.
- Decimal factors may have up to a four-digit number multiplied by a two-digit number.
- Decimal division is limited to the context of money.
- Decimal divisors should not exceed two digits and must be whole numbers.
- Decimal dividends should not exceed four digits.
- Decimal quotients should not have remainders.
- Fraction multiplication is not assessed at Grade 5.
- Fraction division is not assessed at Grade 5.
- When finding equivalent fractions and decimals, items will be limited to percents equivalent to halves, fourths, tenths, and hundredths.
- Items dealing with percents will not involve computation using the percent.

MA.5.A.6.1: Identify and relate prime and composite numbers, factors, and multiples within the context of fractions.


1. Identify and relate prime/composite numbers, factors and multiples within the context of fractions **(MA.5.A.6.1)** DOK: Moderate
   - Concrete: X
   - Pictorial: X
   - Abstract: X
   - Say/Write: X
   - Do: X

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Note: PR = Prerequisite, DOK = Depth of Knowledge (Low, Moderate or High as provided in the FL-Next Generation SSS).
### Fifth Grade Mathematics Concepts and Skills Checklist Cont. . . .

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**SUPPORTING IDEA 6: Number and Operations Cont. . . .**

### MA.5.A.6.2: Use the order of operations to simplify expressions which include exponents and parentheses.

Content Limits for MA.5.A.6.2:
- Items will include no more than five whole numbers (including exponents) within the expression.
- Numbers raised to a power must be single-digit numbers.
- Exponents may not be applied to the entire quantity within parentheses.
- Exponents used on numbers must be either 2 or 3.
- Multiplication will be shown by use of parentheses or a multiplication sign (the dot or x).
- Division will not be shown as a fraction.


2. Use the order of operations to simplify expressions which include exponents and parentheses (MA.5.A.6.2) DOK: Moderate

### MA.5.A.6.3: Describe real-world situations using positive and negative numbers.

Content Limits for MA.5.A.6.3:
- Items may include integers from –500 through 500.


3. Describe real-world situations using positive and negative numbers (MA.5.A.6.3) DOK: Moderate

### MA.5.A.6.4: Compare, order, and graph integers, including integers shown on a number line.

Content Limits for MA.5.A.6.4:
- Items may include integers -500 through 500.
- Items may include the inequality symbols (<, >, ≤, ≥).
- Items will not include timelines (years).

4. Compare, order, and graph integers, including integers shown on a number line (MA.5.A.6.4) DOK: Moderate

### MA.5.A.6.5: Solve non-routine problems using various strategies including “solving a simpler problem” and “guess, check, and revise”.

Content Limits for MA.5.A.6.5:
- Items may include multi-step problems with no more than three operations.
- Items may include concepts from other benchmarks within the Number and Operations strands.
- Students should be able to choose their own strategies to solve the problems.


5. Solve non-routine problems using various strategies including “solving a simpler problem” and “guess, check, and revise” (MA.5.A.6.5) DOK: High
### Fifth Grade Mathematics Concepts and Skills Checklist Cont. . . .

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#### SUPPORTING IDEA 7: Data Analysis

**MA.5.S.7.1:** Construct and analyze line graphs and double bar graphs.

**Content Limits for MA.5.S.7.1:**
- Items may require students to predict if the line graph represents data that is increasing or decreasing. (Students at grade 5 are NOT expected to use the word trend.)
- Items should not include both constructing and analyzing a graph within the same item.
- Analysis may include making and stating conclusions and predictions based on data, comparing data, determining appropriate scale increments dependent upon the range of the data, or identifying different parts of a graph.
- Items should not require students to determine the type of graph to use.
- Items should contain no more than 20 items of raw data that must be categorized or displayed.
- In items where students construct a graph, the number of data points should not exceed ten.
- Students may be expected to perform addition, subtraction, multiplication, or division when constructing and/or analyzing graphs.
- Also assesses MA.5.A.4.2.

**Prior Knowledge for MA.5.S.7.1:** MA.3.S.7.1 and MA.5.A.4.2 including frequency tables, single bar graphs, pictographs, and line plots from data, including surveys and experiments.

**MA.5.S.7.2:** Differentiate between continuous and discrete data, and determine ways to represent those using graphs and diagrams.

**Content Limits for MA.5.S.7.2:**
- Items may include only the first quadrant in a graph.
- Items may include the terms continuous and discrete.
- Items may include frequency tables, single bar graphs, double bar graphs, pictographs, line plots, line graphs, and/or Venn diagrams.
- Also assesses MA.5.A.4.2.

**Prior Knowledge for MA.5.S.7.2 includes MA.3.S.7.1.**

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### Sixth Grade Mathematics Concepts and Skills Checklist

**Note:** PR = Prerequisite, DOK = Depth of Knowledge (Low, Moderate or High as provided in the FL-Next Generation SSS).

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**BIG IDEA 1:** Develop understanding of and fluency with multiplication and division of fractions and decimals.

**General Content Limits related to Big Idea 1:**
- Decimal place values should range from tenths through thousandths.
- Decimal addition items should not require the use of more than five addends.
- Decimal addition addends should not exceed five digits.
- Decimal addition items with five addends should not use five-digit numbers.
- Decimal subtraction subtrahends, minuends, and differences should not exceed five digits.
- Decimal multiplication products should not exceed seven digits.
- Decimal division
  - Divisors should not exceed three digits.
  - Dividends should not exceed four digits.
  - Quotients should not exceed four digits and must terminate within three decimal places.
- Fraction items should use denominators of 1 through 12; any multiple of 2, 3, or 5 through 100; or 1000, or denominators that are derived from basic multiplication facts through 12 x 12.
- Fraction items may include fractions and mixed numbers.
- Fraction addition items should not require the use of more than three unlike denominators.
- Fraction addition items should not require the use of more than three unlike denominators.
- Fraction subtraction items should not require the use of more than three unlike denominators.
- Fraction multiplication items may include up to three factors.
- Fraction division
  - Denominators of fractions must be less than or equal to 12.
  - In fractions that must be simplified, the numerator and denominator must have at least one common prime factor of 2, 3, 5, or 7.

**MA.6.A.1.1:** Explain and justify procedures for multiplying and dividing fractions and decimals.

**Content Limits for MA.6.A.1.1:**
- Items may include mixed numbers, fractions, and/or decimals.
- Items may include decimals through the hundredths place.
- Items will not require the student to simplify fractions.
- Items may not include a combination of fractions and decimals.


1. Explain and justify procedures for multiplying fractions (Part A of MA.6.A.1.1) DOK: Moderate
   - X X X X X X

2. Explain and justify procedures for multiplying decimals (Part B of MA.6.A.1.1) DOK: Moderate
   - X X X X X X

3. Explain and justify procedures for dividing fractions (Part C of MA.6.A.1.1) DOK: Moderate
   - X X X X X X

4. Explain and justify procedures for dividing decimals (Part D of MA.6.A.1.1) DOK: Moderate
   - X X X X X X

**MA.6.A.1.2:** Multiply and divide fractions and decimals efficiently.


5. Multiply fractions efficiently (Part A of MA.6.A.1.2) DOK: Low
   - X X

6. Multiply decimals efficiently (Part B of MA.6.A.1.2) DOK: Low
   - X X

7. Divide fractions efficiently (Part C of MA.6.A.1.2) DOK: Low
   - X X
### Sixth Grade Mathematics Concepts and Skills Checklist Cont.

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**BIG IDEA 1: Develop understanding of and fluency with multiplication and division of fractions and decimals.**

**MA.6.A.1.2 Cont. …**

8. **Divide decimals efficiently (Part D of MA.6.A.1.2) DOK: Low** | x | x |

**MA.6.A.1.3: Solve real-world problems involving multiplication and division of fractions and decimals.**

- **Content Limits for MA.6.A.1.3:**
  - Items may include fractions and mixed numbers.
  - Items may include decimals through the hundredths place.
  - Fractions and decimals may not be used in the same item.
  - In fractions that must be simplified, the numerator and denominator must be simplified to lowest terms with no more than two common prime factors, e.g., 2, 3, 5, or 7.
  - Items may include up to three procedural steps.
  - Items may involve checking for reasonableness of answers, especially when dealing with remainders.
  - Also assesses MA.6.A.1.2.


9. **Solve real-world problems involving multiplication of fractions (Part A of MA.6.A.1.3) DOK: High** | x | x | x | x | x |

10. **Solve real-world problems involving multiplication of decimals (Part B of MA.6.A.1.3) DOK: High** | x | x | x | x | x |

11. **Solve real-world problems involving division of fractions (Part C of MA.6.A.1.3) DOK: High** | x | x | x | x | x |

12. **Solve real-world problems involving division of decimals (Part D of MA.6.A.1.3) DOK: High** | x | x | x | x | x |

**BIG IDEA 2: Connect ratio and rates to multiplication and division.**

**MA.6.A.2.1: Use reasoning about multiplication and division to solve ratio and rate problems.**

- **Content Limits for MA.6.A.2.1:**
  - Rates involving money should be limited to the nearest cent.
  - Ratios may be presented in words or symbols (e.g., 2 to 3, 2:3, 2 out of 3, or 2/3).


**MA.6.A.2.1 is Considered Prior Knowledge for MA.7.A.1.6.**

1. **Use reasoning about multiplication and division to solve ratio problems (Part A of MA.6.A.2.1) DOK: High** | x | x | x | x | x |

2. **Use reasoning about multiplication and division to solve rate problems (Part B of MA.6.A.2.1) DOK: High** | x | x | x | x | x |
**BIG IDEA 2:** Connect ratio and rates to multiplication and division. Cont. …

**MA.6.A.2.2:** Interpret and compare ratios and rates.

**Content Limits for MA.6.A.2.2:**
- Items will not include defining rate and ratio.
- Items will not include inequality symbols.
- Ratios may be presented in words or symbols (e.g., 2 to 3, 2:3, 2 out of 3, or 2/3).


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<td>3. Interpret and compare ratios and rates (MA.6.A.2.2) <strong>DOK: Moderate</strong></td>
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**BIG IDEA 3:** Write, interpret, and use mathematical expressions and equations.

**MA.6.A.3.1:** Write and evaluate mathematical expressions that correspond to given situations.

**Content Limits for MA.6.A.3.1:**
- Expressions may have up to two variables and up to two different operations, with no more than three procedural steps needed to evaluate the expression (e.g., \(2x + 3y\) requires two multiplication steps and one addition step).
- Items will not require students to evaluate expressions having both decimals and fractions.
- Items will not include identifying equivalent expressions using the associative, commutative, or distributive properties.
- Also assesses MA.6.A.3.3.


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<tr>
<td>1. Write and evaluate mathematical expressions that correspond to given situations (MA.6.A.3.1) <strong>DOK: Moderate</strong></td>
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**MA.6.A.3.2:** Write, solve, and graph one- and two- step linear equations and inequalities.

**Content Limits for MA.6.A.3.2:**
- Items may include patterns, graphic models, situations, number lines, graphs, and relationships.
- Items may include up to three variables, if the third variable is isolated on one side, as when using a formula (e.g., \(d = rt\)).
- For compound inequalities expressed as one statement (e.g., \(45 < Y < 55\)) or two statements, and or or may be used.
- Items may have up to two operations, with no more than three procedural steps needed to evaluate the equation, expression, and/or inequality.
- Graphs must be limited to the first quadrant.
- In items involving inequalities, the inequality must include only one variable and may be on a number line.
- Also assesses MA.6.A.3.4.

**MA.6.A.3.2 is Considered Prior Knowledge for** MA.8.A.1.1, and MA.8.A.4.2

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<td>2. Write, solve, and graph one-step linear equations (Part A of MA.6.A.3.2) <strong>DOK: Moderate</strong></td>
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<td>3. Write, solve and graph one-step inequalities (Part B of MA.6.A.3.2) <strong>DOK: Moderate</strong></td>
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<td>4. Write, solve and graph two-step linear equations (Part C of MA.6.A.3.2) <strong>DOK: Moderate</strong></td>
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<td>5. Write, solve and graph two-step inequalities (Part D of MA.6.A.3.2) <strong>DOK: Moderate</strong></td>
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### BIG IDEA 3: Write, interpret, and use mathematical expressions and equations Cont. ...

#### MA.6.A.3.3: Work backward with two-step function rules to undo expressions.

6. Works backward with two-step function rules to undo expressions (MA.6.A.3.3)  
   DOK: Moderate  
   | Concrete | Pictorial | Abstract | Say/Write | Do | Mastery | Retention |
   | x | x |

#### MA.6.A.3.4: Solve problems given a formula.

7. Solve problems given a formula (MA.6.A.3.4)  
   DOK: Moderate  
   | Concrete | Pictorial | Abstract | Say/Write | Do | Mastery | Retention |
   | x | x |

#### MA.6.A.3.5: Apply the Commutative, Associative, and Distributive Properties to show that two expressions are equivalent.

- **Content Limits for MA.6.A.3.5:**
  - Items may include expressions or real-world situations.  
  - No more than two properties should be needed to convert from one expression to an equivalent expression in an item.  
  - Items may include a maximum of two variables.


- **MA.6.A.3.5 is Considered Prior Knowledge for MA.7.A.3.4.**

8. Apply the Commutative, Associative, and Distributive Properties to show that two expressions are equivalent (MA.6.A.3.5)  
   DOK: Moderate  
   | Concrete | Pictorial | Abstract | Say/Write | Do | Mastery | Retention |
   | x | x |

#### MA.6.A.3.6: Construct and analyze tables, graphs, and equations to describe linear functions and other simple relations using both common language and algebraic notation.

- **Content Limits for MA.6.A.3.6:**
  - Items may include tables, graphs, equations, or real-world situations.  
  - Simple relationships may include discrete data that lends itself to a linear relationship.  
  - Graphs should be limited to the first quadrant, and indicated points on the graphs must have whole-number coordinates.  
  - Items will not include the use of the slope formula.


9. Construct and analyze tables to describe linear functions and other simple relations using both common language and algebraic notation (Part A of MA.6.A.3.6)  
   DOK: High  
   | Concrete | Pictorial | Abstract | Say/Write | Do | Mastery | Retention |
   | x | x | x |

10. Construct and analyze graphs to describe linear functions and other simple relations using both common language and algebraic notation (Part B of MA.6.A.3.6)  
    DOK: High  
    | Concrete | Pictorial | Abstract | Say/Write | Do | Mastery | Retention |
    | x | x | x | x |

11. Construct and analyze equations to describe linear functions and other simple relations using both common language and algebraic notation (Part C of MA.6.A.3.6)  
    DOK: High  
    | Concrete | Pictorial | Abstract | Say/Write | Do | Mastery | Retention |
    | x | x | x |
### Mathematics Concepts and Skills Checklist: Sixth Grade Mathematics Concepts and Skills Checklist Cont. . . .

<table>
<thead>
<tr>
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<td>Pictorial</td>
<td>Abstract</td>
<td>Say/Write</td>
</tr>
</tbody>
</table>

**SUPPORTING IDEA 4: Geometry and Measurement**

General Content Limits related to SUPPORTING IDEA 4:
- Measurement items will not assess conversion of units in isolation.

**MA.6.G.4.1: Understand the concept of Pi, know common estimates of Pi (3.14; 22/7) and use these values to estimate and calculate the circumference and the area of circles.**

**Content Limits for MA.6.G.4.1:**
- Items may include using vocabulary such as radius, diameter, and center.
- Item graphics or options may include the use of visual representations or vocabulary associated with a circle, such as chord, arc, sector, and central angle. These terms will not be directly assessed.
- Also Assesses MA.6.A.3.4.

**MA.6.G.4.1 is Considered Prior Knowledge for MA.7.G.4.1.**

1. Use various circular objects to determine that the ratio of circumference to diameter approximates the value of Pi (PR for MA.6.G.4.1)  
   
   | | X | X | X | X | X |

2. Understand the concept of Pi (Part A of MA.6.G.4.1) Moderate  
   
   | | X | X | X | X | X | X |

3. Know common estimates of Pi (3.14; 22/7) (Part B of MA.6.G.4.1) Moderate  
   
   | | X | X |

4. Use common estimates of Pi (3.14; 22/7) to estimate the area of circles (Part C of MA.6.G.4.1) Moderate  
   
   | | X | X | X | X |

5. Use common estimates of Pi (3.14; 22/7) to calculate the area of circles (Part D of MA.6.G.4.1) Moderate  
   
   | | X | X | X | X |

**MA.6.G.4.2: Find the perimeters and areas of composite two-dimensional figures, including non-rectangular figures (such as semicircles) using various strategies.**

**Content Limits for MA.6.G.4.2:**
- Students will work with composite two-dimensional figures, which may be composed of shapes within other shapes.
- Polygons used in composite two-dimensional figures may be convex or concave.
- The figures used within another figure are limited to triangles, quadrilaterals, circles, and semicircles.
- Composite two-dimensional figures may be created from up to three different simple polygons.
- Dimensions of polygons may be whole numbers; fractions with denominators of 2, 4, or 10; or decimal values, which may include 0.25, 0.75, or tenths.
- Composite shapes should not be represented on grids.
- Items will not include the vocabulary of inscribed or circumscribed, but these concepts may be represented graphically.
- Also assesses MA.6.A.3.4.


**MA.6.G.4.2 is Considered Prior Knowledge for MA.7.G.4.1.**

6. Explain that the formula for the area of a circle is plausible by decomposing a circle into a number of wedges and rearranging them into shapes that approximates a parallelogram (PR for MA.6.G.4.2)  
   
   | | X | X | X | X | X |

---

**Note:** PR = Prerequisite, DOK = Depth of Knowledge (Low, Moderate or High as provided in the FL-Next Generation SSS).
### Sixth Grade Mathematics Concepts and Skills Checklist Cont. . . .

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<tr>
<td><strong>Supporting Idea 4: Geometry and Measurement Cont. . . .</strong></td>
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<tr>
<td>7. Approximate the area of composite two-dimensional figures, including non-rectangular figures, from tracing their perimeter on a piece of grid paper and using full squares and partial squares (PR for MA.6.G.4.2)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>8. Find the perimeters of composite two-dimensional figures, including non-rectangular figures (such as semicircles) using various strategies (Part A of MA.6.G.4.2) Moderate</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>9. Find the areas of composite two-dimensional figures, including non-rectangular figures (such as semicircles) using various strategies (Part B of MA.6.G.4.2) Moderate</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</table>

**MA.6.G.4.3:** Determine a missing dimension of a plane figure or prism given its area or volume and some of the dimensions, or determine the area or volume given the dimensions.

**Content Limits for MA.6.G.4.3:**
- Items may include three-dimensional figures, which are limited to cubes and rectangular prisms.
- Items may include two-dimensional figures, which are limited to triangles, parallelograms, trapezoids, rectangles, squares, rhombi, and circles.
- Dimensions of figures may be whole numbers; fractions with denominators of 2, 4, or 10; or decimal values, which may include 0.25, 0.75, or tenths.
- Items will not include composite two-dimensional or three-dimensional figures.
- Items will not include two-dimensional figures represented on grids.
- Also assesses MA.6.A.3.4.

**Prior Knowledge for MA.6.G.4.3 includes MA.5.G.3.2 and MA.5.G.5.4.**

| 10. Determine a missing dimension of a plane, figure or prism, given its area or volume and some of the dimensions, or determine the area or volume given the dimensions (MA.6.G.4.3) Moderate | X | X | X | X |     |    |    |    |    |
### General Content Limits related to SUPPORTING IDEA 5: Number and Operations:
- Whole number items should not require the use of more than three operations.
- Whole number place values should range from -500 through 999,999,999.
- Whole number addition
  - Items should not exceed five addends.
  - Addends should not exceed six digits.
  - Addends in items with five addends should not exceed four digits.
- Whole number subtraction subtractends, minuends, and differences should not exceed six digits.
- Whole number multiplication products should not exceed seven digits.
- Whole number division
  - Divisors should not exceed two digits.
  - Dividends should not exceed four digits.
  - Quotients should be terminating decimals.

### MA.6.A.5.1: Use equivalent forms of fractions, decimals, and percents to solve problems.

#### Content Limits for MA.6.A.5.1:
- Items may include different forms of numbers within the same problem (fractions, decimals, and/or percents).
- Percents used in items must be whole numbers less than or equal to 100.
- Items will not include decimals beyond the thousandths place.
- Items will not include solving percent problems involving multiplying by a percent (e.g., finding discounts, simple interest, taxes, tips, and percents of increase or decrease).
- Items involving finding percents of numbers must use percents that are easily converted to fractions, such as fourths, fifths, tenths, or fractions that can be easily simplified (e.g., 9/12).


### MA.6.A.5.1 is Considered Prior Knowledge for MA.7.A.1.2.

1. Use equivalent forms of fractions, decimals, and percents to solve problems (MA.6.A.5.1)  
   DOK: Moderate
   
<table>
<thead>
<tr>
<th>Concrete</th>
<th>Pictorial</th>
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<tbody>
<tr>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td></td>
<td><strong>Yes</strong></td>
<td><strong>No</strong></td>
</tr>
</tbody>
</table>

### MA.6.A.5.2: Compare and order fractions, decimals, and percents, including finding their approximate location on a number line.

#### Content Limits for MA.6.A.5.2:
- Items may include multiple forms of numbers expressed as fractions, mixed numbers, decimals, or percents.
- Items may include inequality symbols and graphs of inequalities on a number line.
- Items may include mixed numbers or fractions following the general content limits.
- Percents used in items must be whole numbers less than or equal to 100.
- Items will not include decimals beyond the thousandths place.
- No more than five numbers may be compared or ordered in each item.


2. Compare and order fractions, decimals, and percents, including finding their approximate location on a number line (MA.6.A.5.2) DOK: Moderate
   
<table>
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<tr>
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<tbody>
<tr>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
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<td><strong>Yes</strong></td>
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#### SUPPORTING IDEA 5: Number and Operations Cont. …

**MA.6.A.5.3:** Estimate the results of computations with fractions, decimals, and percents, and judge the reasonableness of the results.

**Content Limits for MA.6.A.5.3:**
- Fractions must not exceed those indicated in the general content limits.
- Percents used in items must be whole numbers less than or equal to 100.
- Items will not involve multiplying a number by a percent.
- Items will not include decimals beyond the thousandths place.
- Computations may have up to two different operations, with no more than three procedural steps (e.g., $2(4) + 3(9)$ requires two multiplication steps and one addition step).


3. Estimate the results of computations with fractions and judge the reasonableness of the results (**Part A of MA.6.A.5.3**) DOK: Moderate
   - **Mastery**: Yes
   - **Retention**: Yes

4. Estimate the results of computations with decimals and judge the reasonableness of the results (**Part B of MA.6.A.5.3**) DOK: Moderate
   - **Mastery**: Yes
   - **Retention**: Yes

5. Estimate the results of computations with percents and judge the reasonableness of the results (**Part C of MA.6.A.5.3**) DOK: Moderate
   - **Mastery**: Yes
   - **Retention**: Yes

#### SUPPORTING IDEA 6: Data Analysis

**MA.6.S.6.1:** Determine the measures of central tendency (mean, median, mode) and variability (range) for a given set of data.

**Content Limits for MA.6.S.6.1:**
- Items may include data presented in a table, line plot, bar graph, double bar graph, or line graph.
- The number of data points may not exceed ten when the median or mode is being determined.
- The number of data points may not exceed six when the mean is being calculated.
- Items may include the use of frequency tables for numerical or categorical data.
- Items may include the use of whole numbers; fractions with denominators of 2, 4, or 10; or decimal values, which may include 0.25, 0.75, or tenths.


1. Match a given story to a graph (two variables) (PR for MA.6.S.6.1 and MA.6.S.6.2)
   - **Mastery**: Yes
   - **Retention**: Yes
   - **Validation**: Say/Write

2. Use a number line involving whole numbers and fractions or decimals (PR for MA.6.S.6.1 and MA.6.S.6.2)
   - **Mastery**: Yes
   - **Retention**: Yes
   - **Validation**: Say/Write

3. Read, locate and interpret information from a table (PR for MA.6.S.6.1 and MA.6.S.6.2)
   - **Mastery**: Yes
   - **Retention**: Yes

   - **Mastery**: Yes
   - **Retention**: Yes

5. Understand the concept of outliers in a set of data (PR for MA.6.S.6.1 and MA.6.S.6.2)
   - **Mastery**: Yes
   - **Retention**: Yes
### Sixth Grade Mathematics Concepts and Skills Checklist Cont. . .

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#### SUPPORTING IDEA 6: Data Analysis. MA.6.S.6.1 Cont. …

6. **Make frequency tables for numerical or categorical data, grouping data in different ways to investigate how different groupings describe the data (PR for MA.6.S.6.1 and MA.6.S.6.2)**  
   - Concrete: No, Pictorial: Yes, Abstract: Yes
   - Say/Write: No, Do: Yes
   - Mastery: Yes, Retention: Yes

7. **Make graphs for numerical or categorical data, grouping data in different ways to investigate how different groupings describe the data (PR for MA.6.S.6.1 and MA.6.S.6.2)**  
   - Concrete: No, Pictorial: Yes, Abstract: Yes
   - Say/Write: No, Do: Yes
   - Mastery: Yes, Retention: Yes

8. **Determine the mean as a measure of central tendency for a given set of data (Part A of MA.6.S.6.1) Low**  
   - Concrete: No, Pictorial: Yes, Abstract: Yes
   - Say/Write: No, Do: Yes
   - Mastery: Yes, Retention: Yes

9. **Determine the median as a measure of central tendency for a given set of data (Part B of MA.6.S.6.1) Low**  
   - Concrete: No, Pictorial: Yes, Abstract: Yes
   - Say/Write: No, Do: Yes
   - Mastery: Yes, Retention: Yes

10. **Determine the mode as a measure of central tendency for a given set of data (Part C of MA.6.S.6.1) Low**  
    - Concrete: No, Pictorial: Yes, Abstract: Yes
    - Say/Write: No, Do: Yes
    - Mastery: Yes, Retention: Yes

11. **Determine the range as a measure of variability for a given set of data (Part D of MA.6.S.6.1) Low**  
    - Concrete: No, Pictorial: Yes, Abstract: Yes
    - Say/Write: No, Do: Yes
    - Mastery: Yes, Retention: Yes

**MA.6.S.6.2: Select and analyze the measures of central tendency or variability to represent, describe, analyze, and/or summarize a data set for the purposes of answering questions appropriately.**

- **Content Limits for MA.6.S.6.2:**
  - Items may include data sets that are presented as lists, frequency tables, and charts.
  - The number of data points may not exceed six when the mean is being calculated.
  - The number of data points may not exceed ten when the median or mode is being determined.
  - Graphical displays are limited to line graphs, double bar graphs, bar graphs, pictographs, and line plots.
  - Items will not assess the vocabulary measures of central tendency or variability.
  - Items may include, in both stem or answer options, the vocabulary word outlier.

- **Prior Knowledge for MA.6.S.6.2 includes MA.3.S.7.1 and MA.5.S.7.1.**


12. **Select and analyze the measures of central tendency or variability to represent, describe, analyze and/or summarize a data set for the purposes of answering questions appropriately (MA.6.S.6.2) High**  
    - Concrete: No, Pictorial: Yes, Abstract: Yes
    - Say/Write: No, Do: Yes
    - Mastery: Yes, Retention: Yes
### Seventh Grade Mathematics Concepts and Skills Checklist

**Note:** PR = Prerequisite, DOK = Depth of Knowledge (Low, Moderate or High as provided in the FL-Next Generation SSS).

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<tr>
<td><strong>BIG IDEA 1: Develop an understanding of and apply proportionality, including similarity.</strong></td>
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<tr>
<td>MA.7.A.1.1: Distinguish between situations that are proportional or not proportional, and use proportions to solve problems.</td>
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<tr>
<td><strong>Content Limits for MA.7.A.1.1:</strong></td>
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<tr>
<td>• Items will not include discounts, simple interest, taxes, tips, percents of increase or decrease, inverse variation, scale drawing, or constant speed.</td>
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<tr>
<td>• Items will not include negative numbers.</td>
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<tr>
<td>1. Distinguish between situations that are proportional or not proportional (Part A of MA.7.A.1.1) DOK: High</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>2. Use proportions to solve problems (Part B of MA.7.A.1.1) DOK: High</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td><strong>MA.7.A.1.2: Solve percent problems, including problems involving discounts, simple interest, taxes, tips, and percents of increase or decrease.</strong></td>
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<tr>
<td><strong>Content Limits for MA.7.A.1.2:</strong></td>
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<tr>
<td>• Items may include solving for the whole, the part, or the percent.</td>
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<tr>
<td>• Percents greater than 100 should be in multiples of 10 or 25, up to 300.</td>
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<tr>
<td>• Percents less than 100 should be whole numbers or mixed numbers, which can be written in decimal form (e.g., 3 ½% as 3.5%).</td>
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<td>• Items may require the student to round answers to the nearest whole number, dollar, cent, percent, or other amount, as appropriate.</td>
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<tr>
<td>3. Solve percent problems, including problems involving discounts, simple interest, taxes, tips and percents of increase or decrease (MA.7.A.1.2) DOK: High</td>
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<tr>
<td><strong>MA.7.A.1.3: Solve problems involving similar figures.</strong></td>
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<td><strong>Content Limits for MA.7.A.1.3:</strong></td>
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<tr>
<td>• Items may include graphic representations of three-dimensional objects, but the similar figures being assessed must be two-dimensional figures.</td>
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<tr>
<td>• Items may include diagonals of two-dimensional figures.</td>
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<tr>
<td>• Items will not require the use of the Pythagorean theorem.</td>
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<tr>
<td>• Items will not include circles.</td>
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<td>• Items will not include how changes in dimensions affect perimeter, circumference, area, or volume.</td>
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<tr>
<td><strong>Prior Knowledge for MA.7.A.1.3 includes MA.6.A.2.2.</strong></td>
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<tr>
<td>4. Solve problems involving similar figures (MA.7.A.1.3) DOK: High</td>
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</tbody>
</table>
### BIG IDEA 1: Develop an understanding of and apply proportionality, including similarity. Cont. …

**MA.7.A.1.4:** Graph proportional relationships and identify the unit rate as the slope of the related linear function.

**Content Limits for MA.7.A.1.4:**
- Students should not be expected to use \( y = mx + b \) or the slope formula in order to solve items in this benchmark.
- Items will not include determining the slope using formulas.
- Items may include up to two variables, with no more than five procedural steps needed to evaluate the expression, equation, or inequality.
- Items may include the use of whole numbers, fractions, and terminating decimals as indicated in the general content limits.
- Items may include all four quadrants on a coordinate grid.
- Items may include the concept of positive slope, negative slope, no slope, or zero slope.

**Prior Knowledge for MA.7.A.1.4 includes MA.6.A.3.6.**

**MA.7.A.1.4 is Considered Prior Knowledge for MA.8.A.1.2.**

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<tr>
<td>MA.7.A.1.5:</td>
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<tr>
<td>Distinguish direct variation from other relationships, including inverse variation.</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

**Content Limits for MA.7.A.1.5:**
- Items may include graphs, using four quadrants, function tables, and situations.
- Representations (graphs, tables, situations) used in the item may be non-linear; however, items will not assess the vocabulary related to non-linear relationships (i.e., parabolas, quadratic).
- Graphs in items with real-world context are limited to the first quadrant only.
- Graphs in items with mathematical context may use all four quadrants.

6. Distinguish direct variation from other relationships, including inverse variation (MA.7.A.1.5) DOK: Moderate | x | x | x |

**MA.7.A.1.6:** Apply proportionality to measurement in multiple contexts, including scale drawings and constant speed.

**Content Limits for MA.7.A.1.6:**
- Measurements may be in either metric or customary units, but measurements from both systems may not be used in the same item.
- Items may include the concepts of average speed or constant speed.
- Items may include fractions with denominators of 2, 3, 4, 5, 6, 8, 10, 12, 16, 20, 24, 25, 32, or 50.
- Items may include decimals through the hundredths place.
- Items will not include circumference, perimeter, area, or volume.
- Items will not include percents of increase or decrease.
- Items will not include converting units between two derived units (e.g., converting miles per hour to feet per second).

**Prior Knowledge for MA.7.A.1.6 includes MA.6.A.2.1, and MA6.A.2.2.**

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<tr>
<td>7. Convert among different units of measurement to solve problems involving rates (PR for MA.7.A.1.6)</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Apply proportionality to measurement in multiple contexts, including scale drawings (Part A of MA.7.A.1.6) DOK: Moderate</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>9. Apply proportionality to measurement in multiple contexts, including constant speed (Part B of MA.7.A.1.6) DOK: Moderate</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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</table>
### BIG IDEA 2: Develop an understanding of and use formulas to determine surface and volumes of three-dimensional shapes.

#### MA.7.G.2.1: Justify and apply formulas for surface area and volume of pyramids, prisms, cylinders, and cones.

**Content Limits for MA.7.G.2.1:**
- Dimensions of given figures will be whole numbers.
- Problems related to surface area will not include cones, but problems related to volume can include cones.
- In calculating surface area and volume of simple shapes, dimensions of given figures will be whole numbers.

**Prior Knowledge for MA.7.G.2.1 includes MA.5.G.3.2.**

1. Justify and apply formulas for surface area of pyramids, prisms, and cylinders (Part A of MA.7.G.2.1) DOK: Moderate
   
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2. Justify and apply formulas for volume of pyramids, prisms, cylinders, and cones (Part B of MA.7.G.2.1) DOK: Moderate

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#### MA.7.G.2.2: Use formulas to find surface areas and volume of three-dimensional composite shapes.

**Content Limits for MA.7.G.2.2:**
- Students will solve problems involving surface area or volume using the decomposition of three-dimensional figures.
- Three-dimensional figures used in composite figures are limited to three and may include right-rectangular prisms, right triangular prisms, right-square pyramids, right circular cylinders, and cones.
- Problems related to surface area will not include cones, but problems related to volume can include cones.
- Items that include cones and cylinders used in the composition or decomposition may include only whole figures, half-figures, or quarter-figures.
- Right-square pyramids used in the composition or decomposition must be whole pyramids only.
- Items will not include truncated cones and pyramids.
- Dimensions of composite figures used in calculations will be whole numbers.

3. Use formulas to find surface areas of three-dimensional composite shapes (figure being composed or decomposed may include circles or parts of circles) (Part A of MA.7.G.2.2) DOK: Moderate

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4. Use formulas to find volume of three-dimensional composite shapes (figure being composed or decomposed may include circles or parts of circles) (Part B of MA.7.G.2.2) DOK: Moderate

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### BIG IDEA 3: Develop an understanding of operations on all rational numbers and solving linear equations.

**General Content Limits for Big Idea 3:**
- Decimal place values should range from tenths through ten-thousandths.
- Decimal addition items should not exceed five addends.
- Decimal addition addends should not exceed six digits.
- Decimal subtraction subtrahends, minuends, and differences should not exceed six digits.
- Decimal multiplication products should not exceed eight digits.
- Decimal division
  - Divisors should not exceed three digits.
  - Dividends should not exceed five digits.
  - Quotients should not exceed seven digits.
- Fraction items should use denominators through 1000.
- Fraction items may include fractions and mixed numbers.
- Fraction addition items should not require the use of more than three addends.
- Fraction division items divisors cannot be mixed numbers.
### BIG IDEA 3: Develop an understanding of operations on all rational numbers and solving linear equations. Cont. …

#### MA.7.A.3.1: Use and justify the rules for adding, subtracting, multiplying, dividing, and finding the absolute value of integers.

**Content Limits for MA.7.A.3.1:**
- Items may include the effects of the four basic operations on integers, and the use of properties of real numbers to solve problems (commutative, associative, distributive, identity, equality, inverse, and the inverse relationship of positive and negative numbers).
- Items should include at least one integer in the computation.
- Items may use fractions less than 1 with numerators and denominators less than 100.
- Items may use decimals to the ten-thousandths place.
- Items may include up to three operations, with no more than five procedural steps needed to evaluate the expression.

1. Use and justify the rules for adding, subtracting, multiplying, dividing, and finding the absolute value of integers (MA.7.A.3.1)
   - DOK: Moderate
   - Mastery: Yes
   - Retention: No

#### MA.7.A.3.2: Add, subtract, multiply, and divide integers, fractions, and terminating decimals, and perform exponential operations with rational bases and whole number exponents including solving problems in everyday contexts.

**Content Limits for MA.7.A.3.2:**
- Items may include up to three operations and up to five procedural steps.
- Items may include at least one negative integer, fraction, or terminating decimal.
- Items may include whole-number exponents less than or equal to 4.
- Items will not include raising an exponential expression to a power or using the laws of exponents (e.g., \((2^3)^2\)).
- Items will not include scientific notation.

**Prior Knowledge for MA.7.A.3.2 includes MA.5.A.6.2.**


2. Add, subtract, multiply, and divide integers, including solving problems in everyday contexts (Part A of MA.7.A.3.2) DOK: Moderate
   - Mastery: Yes
   - Retention: No

3. Add, subtract, multiply, and divide fractions, including solving problems in everyday contexts (Part B of MA.7.A.3.2) DOK: Moderate
   - Mastery: Yes
   - Retention: No

4. Add, subtract, multiply, and divide terminating decimals including solving problems in everyday contexts (Part C of MA.7.A.3.2) DOK: Moderate
   - Mastery: Yes
   - Retention: No

5. Perform exponential operations with rational bases and whole number exponents including solving problems in everyday contexts (Part D of MA.7.A.3.2) DOK: Moderate
   - Mastery: Yes
   - Retention: No
### BIG IDEA 3: Develop an understanding of operations on all rational numbers and solving linear equations Cont. …

MA.7.A.3.3: Formulate and use different strategies to solve one-step and two-step linear equations, including equations with rational coefficients.

**Content Limits for MA.7.A.3.3:**
- Items involving finding a solution should be limited to a single variable on one side of the equation.
- Items identifying formulating an equation for a situation may involve two variables.
- Items may not exceed two procedural steps and four operational steps.
- Items may not include irrational coefficients.
- Also assesses MA.7.A.5.2.


6. Formulate and use different strategies to solve one-step, including equations with rational coefficients (Part A of MA.7.A.3.3) DOK: Moderate

7. Formulate and use different strategies to solve two-step linear equations, including equations with rational coefficients (Part B of MA.7.A.3.3) DOK: Moderate

MA.7.A.3.4: Use the properties of equality to represent an equation in a different way and to show that two equations are equivalent in a given context.

**Content Limits for MA.7.A.3.4:**
- Items may include up to three operations.
- Equations (or expressions) used in items may include up to three operations.
- Coefficients and constants used in multi-step equations (or expressions) must be integers.
- Items that contain one-step equations may use fractions less than 1.


8. Use the properties of equality to represent an equation in a different way (Part A of MA.7.A.3.4) DOK: Moderate

9. Use the properties of equality to show that two equations are equivalent in a given context (Part B of MA.7.A.3.4) DOK: Moderate

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<p>| 6. Formulate and use different strategies to solve one-step, including equations with rational coefficients (Part A of MA.7.A.3.3) DOK: Moderate |
|---|---|---|---|---|
| 7. Formulate and use different strategies to solve two-step linear equations, including equations with rational coefficients (Part B of MA.7.A.3.3) DOK: Moderate |
| 8. Use the properties of equality to represent an equation in a different way (Part A of MA.7.A.3.4) DOK: Moderate |
| 9. Use the properties of equality to show that two equations are equivalent in a given context (Part B of MA.7.A.3.4) DOK: Moderate |</p>
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### SUPPORTING IDEA 4: Geometry and Measurement

**General Content Limits related to SUPPORTING IDEA 4:**
- **Measurement:** See benchmark for specific content limits.

**MA.7.G.4.1:** Determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures, and apply these relationships to solve problems.

**Content Limits for MA.7.G.4.1:**
- Items that increase the dimensions of a figure should use scale factors that are whole numbers less than or equal to 25.
- Items that decrease the dimensions of a figure should use scale factors of 1/2, 1/3, 1/4, 1/10, 10%, 25%, or 50%. Distracters in MC items may exceed this limit.
- Items assessing change in volume should only include right-rectangular prisms and right-circular cylinders.
- Items will not assess changes in surface area.


1. **Determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures (Part A of MA.7.G.4.1)**
   - DOK: High
   - X X X X X

2. **Apply the relationships of how changes in dimensions affect the perimeter, area, and volume of common geometric figures to solve problems (Part B of MA.7.G.4.1)**
   - DOK: High
   - X X X X X

**MA.7.G.4.2:** Predict the results of transformations, and draw transformed figures with and without the coordinate plane.

**Content Limits for MA.7.G.4.2:**
- Items may include dilations, translations, reflections, and rotations of two-dimensional figures.
- Items that include translations will be limited to horizontal or vertical moves.
- Items may include lines of reflection, which may or may not pass through the object being reflected.
- Items may include centers of rotation, which may or may not be on the object being rotated.
- Items may include clockwise and counterclockwise rotations, which are limited to 45°, 90°, 180°, 270°, and 360°.
- Items may present figures on coordinate grids, which may include all four quadrants.
- Items may include the concepts of symmetry or congruency.
- Items may include up to three translations.

**Prior Knowledge for MA.7.G.4.2 includes MA.4.G.5.2.**

4. **Predict the results of transformations with the coordinate plane (Part B of MA.7.G.4.2)**
   - DOK: Moderate
   - X X X X

5. **Draw transformed figures without the coordinate plane (Part C of MA.7.G.4.2)**
   - DOK: Moderate
   - X X X X

6. **Draw transformed figures with the coordinate plane (Part D of MA.7.G.4.2)**
   - DOK: Moderate
   - X X X X

7. **Identify all four quadrants of the coordinate plane (PR for MA.7.G.4.3)**
   - X X X X

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Note: PR = Prerequisite, DOK = Depth of Knowledge (Low, Moderate or High as provided in the FL-Next Generation SSS).
### Seventh Grade Mathematics Concepts and Skills Checklist Cont. . .

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**SUPPORTING IDEA 4: Geometry and Measurement Cont. . .**

**MA.7.G.4.3:** Identify and plot ordered pairs in all four quadrants of the coordinate plane.

**Content Limits for MA.7.G.4.3:**
- Scales on graphs used in items must be in increments of 1 for both the x- and y-axes.
- Both coordinates of all points used in items must be between -10 and 10, inclusive.
- Items will not include finding the midpoint of a segment, the slope of a line, or use of the distance formula.
- Items will not include determining the x- or y-intercepts of a line.

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<tr>
<td>8. Identify ordered pairs in all four quadrants of the coordinate plane (Part A of MA.7.G.4.3) DOK: Low</td>
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<td>9. Plot ordered pairs in all four quadrants of the coordinate plane (Part B of MA.7.G.4.3) DOK: Low</td>
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**MA.7.G.4.4:** Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)), dimensions, and derived units to solve problems.

**Content Limits for MA.7.G.4.4:**
- Items may include conversions from customary to metric or vice versa, using only one of the conversions found on the reference sheet.
- Items may include up to three conversions within the same system of measurement (e.g., millimeters to centimeters, centimeters to meters, and meters to kilometers).
- Items may include conversions within the same unit of measure when converting derived units (e.g., miles per hour to feet per second).
- Items may include converting a denominate number (e.g., 5 ft 3 in.) to a single unit within the same system of measurement, or vice versa.
- Gridded-response items may only involve conversions within the same system of measurement.
- Items will not include a combination of multiple conversions within the same system and across different measurement systems (e.g., convert meters to inches).

**Prior Knowledge for MA.7.G.4.4 includes MA.5.G.5.2**

**MA.7.G.4.4 is Considered Prior Knowledge for MA.8.G.5.1.**

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<tr>
<td>10. Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)), dimensions, and derived units to solve problems (MA.7.G.4.4) DOK: High</td>
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**SUPPORTING IDEA 5: Number and Operations**

**General Content Limits related to SUPPORTING IDEAS: Number and Operations:**
- Whole number addition items should not require the use of more than five addends.
- Whole number addition addends should not exceed six digits.
- Whole number subtraction subtrahends, minuends, and differences should not exceed six digits.
- Whole number multiplication products should not exceed eight digits.
- Whole number division dividends should not exceed five digits.
- Percent: See benchmark for specific content limits.
### Seventh Grade Mathematics Concepts and Skills Checklist Cont. . .

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**SUPPORTING IDEA 5: Number and Operations Cont. . .**

**MA.7.A.5.1:** Express rational numbers as terminating or repeating decimals.

- **Content Limits for MA.7.A.5.1:**
  - Items may include mixed numbers, fractions, and decimals that are terminating or repeating.
  - Items will not include mixed numbers.
  - Items will not include converting a repeating decimal to a fraction or mixed number.
  - Decimals that must be converted to fractions must terminate by the thousandths place.

1. Express rational numbers as terminating or repeating decimals (MA.7.A.5.1) DOK: Low

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**MA.7.A.5.2:** Solve non-routine problems by working backwards.

2. Solve non-routine problems by working backwards (MA.7.A.5.2) DOK: High

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**SUPPORTING IDEA 6: Data Analysis**

**MA.7.S.6.1:** Evaluate the reasonableness of a sample to determine the appropriateness of generalizations made about the population.

- **Content Limits for MA.7.S.6.1:**
  - Items may include common misuses of statistics based on an inadequate or non-representative sample, or an over-generalized result.
  - Items may provide measures of central tendency or variability.
  - Items will not include calculating measures of central tendency or variability.
  - No more than 25 sets of data are to be displayed.
  - The sample size should not exceed the general content limits.


1. Evaluate the reasonableness of a sample to determine the appropriateness of generalizations made about the population (MA.7.S.6.1) DOK: High

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**MA.7.S.6.2:** Construct and analyze histograms, stem-and-leaf plots, and circle graphs.

- **Content Limits for MA.7.S.6.2:**
  - Items may provide or include calculating measures of central tendency and variability for the data displayed in histograms, stem-and-leaf plots, and circle graphs only.
  - The number of data pieces displayed should not exceed ten when a measure of central tendency is being calculated.
  - The number of data pieces displayed should not exceed 25 when a measure of central tendency is not being calculated.
  - Percents used in items assessing circle graphs will be limited to whole-number percents.


**MA.7.S.6.2 is Considered Prior Knowledge for MA.8.S.3.1.**

2. Construct and analyze histograms (Part A of MA.7.S.6.2) DOK: Moderate

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3. Construct and analyze stem-and-leaf plots (Part B of MA.7.S.6.2) DOK: Moderate

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4. Construct and analyze circle graphs (Part C of MA.7.S.6.2) DOK: Moderate

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**SUPPORTING IDEA 7: Probability**

**MA.7.P.7.1:** Determine the outcome of an experiment and predict which events are likely or unlikely, and if the experiment is fair or unfair.

**Content Limits for MA.7.P.7.1:**
- Items may include concepts such as certain, impossible, likelihood, fair, unfair, most likely, equally likely, and least likely.
- Items will include only simple events.
- Items may include representing probabilities as fractions, ratios, decimals between 0 and 1 (inclusive), and/or percentages between 0 and 100 (inclusive).
- Items will not include combinations or permutations.
- In items involving the determination of all possible outcomes, the number of outcomes should not exceed 36.

1. Represent probabilities as fractions and decimals between 0 and 1 (inclusive) (PR for MA.7.P.7.1 and MA.7.P.7.2) | x | x |
2. Represent probabilities as percentages between 0% and 100% (inclusive) (PR for MA.7.P.7.1 and MA.7.P.7.2) | x | x |
3. Verify that the probabilities are reasonable or valid (PR for MA.7.P.7.1 and MA.7.P.7.2) | x | x | x | x | x |
4. Know when an experiment involves or does not involve "replacement" of an event (PR for MA.7.P.7.1 and MA.7.P.7.2) | x | x |
5. Distinguish between independent and dependent events (PR for MA.7.P.7.1 and MA.7.P.7.2) | x | x |
6. Determine the outcome of an experiment (Part A of MA.7.P.7.1) DOK: Moderate | x | x | x | x | x |
7. Predict which events of an experiment are likely or unlikely (Part B of MA.7.P.7.1) DOK: Moderate | x | x |
8. Determine if the experiment is fair or unfair based on the outcome of an experiment (Part C of MA.7.P.7.1) DOK: Moderate | x | x | x | x | x |
### Seventh Grade Mathematics Concepts and Skills Checklist Cont. . . .

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**SUPPORTING IDEA 7: Probability Cont. . . .**

**MA.7.P.7.2:** Determine, compare, and make predictions based on experimental or theoretical probability of independent or dependent events.

**Content Limits for MA.7.P.7.2:**
- Items may include determining the probability of a compound event both with and without replacement.
- Items may include distinguishing between independent and dependent events.
- Items may include distinguishing between odds and probability.
- Items assessing odds should use the phrases odds in favor of and odds against.
- Probabilities should be expressed as a whole numbers, fractions, or decimals.
- Items assessing compound events should not exceed sixteen outcomes in a sample space.

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10. Determine, compare, and make predictions based on experimental probability of dependent events (**Part B of MA.7.P.7.2**) DOK: High

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11. Determine, compare, and make predictions based on theoretical probability of independent events (**Part C of MA.7.P.7.2**) DOK: High

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12. Determine, compare, and make predictions based on theoretical probability of dependent events (**Part D of MA.7.P.7.2**) DOK: High

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# Eighth Grade Mathematics Concepts and Skills Checklist

**Note:** PR = Prerequisite, DOK = Depth of Knowledge (Low, Moderate or High as provided in the FL-Next Generation SSS).

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## BIG IDEA 1: Analyze and represent linear functions and solve linear equations systems of linear equations.

**MA.8.A.1.1:** Create and interpret tables, graphs, and models to represent, analyze, and solve problems related to linear equations, including analysis of domain, range, and the difference between discrete and continuous data.

- **Content Limits for MA.8.A.1.1:**
  - Equations used in items should include no more than two variables and no more than two operations.
  - Values in expressions should be rational numbers.
  - In items that contain equations, the equation must be linear.


1. Create and interpret tables, graphs, and models to represent, analyze, and solve problems related to linear equations, including analysis of domain, range and the difference between discrete and continuous data (Part A of MA.8.A.1.1) DOK: High

|               | x | x | x | x | x |

2. Analyze the domain, range and difference between discrete and continuous data as part of solving problems related to linear equations (Part B of MA.8.A.1.1) DOK: High

|               | x | x | x | x | x |

## MA.8.A.1.2: Interpret the slope and the x- and y-intercepts when graphing a linear equation for a real-world problem.

- **Content Limits for MA.8.A.1.2:**
  - Functions may be from all four quadrants.
  - Items should rely primarily on tables, graphs, and t-tables to present real-world relationships.
  - Equations used in items should include no more than three operations.
  - Items may include positive, negative, or zero slopes, but not undefined slopes.
  - The x- and y-intercepts are limited to integers and halves.


3. Interpret the slope and the x- and y-intercepts when graphing a linear equation for a real-world problem (MA.8.A.1.2) DOK: Moderate

|               | x | x | x |

## MA.8.A.1.3: Use tables, graphs, and models to represent, analyze, and solve real-world problems related to systems of linear equations.

- **Content Limits for MA.8.A.1.3:**
  - Graphs used in items may include all four quadrants.
  - Items should rely primarily on tables, graphs, or models to present problems.
  - Items may assess knowledge of the slopes of lines (including vertical and horizontal lines) and the x- and y-intercepts of lines.
  - Items may assess properties of parallel or perpendicular lines.
  - Also, assesses MA.8.A.1.4.

4. Use tables, graphs, and models to represent, analyze, and solve real-world problems related to systems of linear equations (MA.8.A.1.3) DOK: High

|               | x | x | x | x | x |

## MA.8.A.1.4: Identify the solution to a system of linear equations using graphs.

5. Identify the solution to a system of linear equations using graphs. (MA.8.A.1.4) DOK: Moderate

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**BIG IDEA 1: Analyze and represent linear functions and solve linear equations systems of linear equations.**

**MA.8.A.1.5:** Translate among verbal, tabular, graphical, and algebraic representations of linear functions.

**Content Limits for MA.8.A.1.5:**
- Functions may include points from all four quadrants.
- Values in equations should be rational numbers.
- Items should present a table or graph and ask the student to identify another representation of the given function.

**Prior Knowledge for MA.8.A.1.5 includes MA.6.A.3.6.**

6. Translate among verbal, tabular, graphical and algebraic representations of linear functions *(MA.8.A.1.5)* DOK: Moderate

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**MA.8.A.1.6:** Compare the graphs of linear and non-linear functions for real-world situations.

**Content Limits for MA.8.A.1.6:**
- Items may include stimuli of a scenario with four different graphs for options or a graph with four different scenarios.
- Items will ask students to interpret graphical representations but not to solve them.

**Prior Knowledge for MA.8.A.1.6 includes MA.6.A.3.6.**

7. Know when a situation can be modeled by a linear function and when it cannot *(PR of MA.8.A.1.6)*

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8. Compare the graphs of linear and non-linear functions for real-world situations *(MA.8.A.1.6)* DOK: Moderate

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**BIG IDEA 2: Analyze two- and three-dimensional figures by using distance and angle.**

**MA.8.G.2.1:** Use similar triangles to solve problems that include height and distances.

**Content Limits for MA.8.G.2.1:**
- Items may not require applying the Pythagorean theorem.

1. Use similar triangles to solve problems that include height and distances *(MA.8.G.2.1)* DOK: High

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**MA.8.G.2.2:** Classify and determine the measure of angles, including angles created when parallel lines are cut by transversals.

**Content Limits for MA.8.G.2.2:**
- Items may include the concepts of alternate interior angles, alternate exterior angles, same-side interior angles, same-side exterior angles, vertical angles, corresponding angles, complementary angles, and supplementary angles.
- Items will have no more than two transversals intersecting through two parallel lines.

2. Identify congruent angles, and unique pairings of angles that can be used to determine the measure of missing angles *(PR for MA.8.G.2.2)*

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3. Classify and determine the measure of angles, including angles created when parallel lines are cut by transversals [including vertical, complementary, supplementary, and corresponding angles] *(MA.8.G.2.2)* DOK: Low

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### BIG IDEA 2: Analyze two- and three-dimensional figures by using distance and angle Cont. ...

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<tr>
<td><strong>MA.8.G.2.3:</strong> Demonstrate that the sum of the angles in a triangle is 180-degrees and apply this fact to find unknown measure of angles and the sum of angles in polygons.</td>
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<tr>
<td>4. Demonstrate that the sum of the angles in a triangle is 180º (Part A of <strong>MA.8.G.2.3</strong>) DOK: Moderate</td>
<td>X</td>
<td>X</td>
<td>x</td>
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<tr>
<td>5. Apply the fact that the sum of the angles in a triangle is 180º to find unknown measure of angles (Part B of <strong>MA.8.G.2.3</strong>) DOK: Moderate</td>
<td>X</td>
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<tr>
<td>6. Apply the fact that the sum of the angles in a triangle is 180º to find the sum of angles in polygons (Part C of <strong>MA.8.G.2.3</strong>) DOK: Moderate</td>
<td>X</td>
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### MA.8.G.2.4: Validate and apply Pythagorean Theorem to find distances in real world situations or between points in the coordinate plane.

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<td><strong>MA.8.G.2.4:</strong> Validate and apply Pythagorean Theorem to find distances in real world situations or between points in the coordinate plane.</td>
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<tr>
<td>7. Validate and apply Pythagorean Theorem to find distances in real world situations (Part A of <strong>MA.8.G.2.4</strong>) DOK: Moderate</td>
<td>X</td>
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<tr>
<td>8. Validate and apply Pythagorean Theorem to find distances between points in the coordinate plane (Part B of <strong>MA.8.G.2.4</strong>) DOK: Moderate</td>
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### BIG IDEA 3: Analyze and summarize data sets.

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<td><strong>MA.8.S.3.1:</strong> Select, organize and construct appropriate data displays, including box and whisker plots, scatter plots, and lines of best fit to convey information and make conjectures about possible relationships.</td>
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<tr>
<td>1. Select, organize and construct appropriate data displays, including box to convey information and make conjectures about possible relationships (Part A of <strong>MA.8.S.3.1</strong>) DOK: Moderate</td>
<td>X</td>
<td>X</td>
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Note: PR = Prerequisite, DOK = Depth of Knowledge (Low, Moderate or High as provided in the FL-Next Generation SSS).
Eighth Grade Mathematics Concepts and Skills Checklist Cont. . . .

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**BIG IDEA 3: Analyze and summarize data sets. MA.8.S.3.1 Cont. . . .**

2. Select, organize and construct appropriate data displays, including scatter plots to convey information and make conjectures about possible relationships (Part B of MA.8.S.3.1) DOK: Moderate

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3. Select, organize and construct appropriate data displays, including lines of best fit to convey information and make conjectures about possible relationships (Part C of MA.8.S.3.1) DOK: Moderate

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**MA.8.S.3.2: Determine and describe how changes in data values impact measures of central tendency.**

**Content Limits for MA.8.S.3.2:**
- Data sets used in items shall be limited to a maximum of 12 data points, and no more than three categories of information should be used.
- Items will assess finding the mean, median, or mode of a set of data presented in a chart, table, graph, or plot (e.g., scatter plot, stem-and-leaf plot, line plot, or box-and-whisker plot) when there is a change in the data set given.


4. Determine and describe how changes in data values impact measures of central tendency (MA.8.S.3.2) DOK: Moderate

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**SUPPORTING IDEA 4: Algebra**

**MA.8.A.4.1: Solve literal equations for a specified variable.**

**Content Limits for MA.8.A.4.1:**
- Items should contain no more than three variables and no more than three operations.
- The stem must have an integral coefficient.
- In items that contain equations, the equation should be linear.
- Inequalities will not be assessed in this benchmark.

1. Solve literal equations for a specified variable (MA.8.A.4.1) DOK: Low

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**MA.8.A.4.2: Solve and graph one- and two-step inequalities in one variable.**

**Content Limits for MA.8.A.4.2:**
- Items should contain no more than two variables and no more than two operations.
- Inequalities must be linear.

**Prior Knowledge for MA.8.A.4.2 includes** MA.6.A.3.2.

2. Solve one-step inequalities in one variable (Part A of MA.8.A.4.2) DOK: Moderate

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3. Graph one-step inequalities in one variable (Part B of MA.8.A.4.2) DOK: Moderate

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4. Solve two-step inequalities in one variable (Part C of MA.8.A.4.2) DOK: Moderate

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5. Graph two-step inequalities in one variable (Part D of MA.8.A.4.2) DOK: Moderate

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### Supporting Idea 5: Geometry and Measurement

#### MA.8.G.5.1: Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)) and dimensions including temperature, area, volume, and derived units to solve problems.

**Content Limits for MA.8.G.5.1:**
- The majority of the items addressing dimensions should focus on area, volume, and capacity.
- Items may involve mixed units within each system, such as converting hours and minutes to seconds.
- Only items assessing derived units will convert time measurements.
- Items may include conversion from customary to metric or vice versa, using only the conversions found on the conversion sheet.
- Items may include up to three conversions within the same system of measurement (e.g., converting cups to gallons).
- Gridded-response items may only involve conversions within the same system of measurement.

**Prior Knowledge for MA.8.G.5.1 includes MA.7.G.4.4.**

1. **Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)) and dimensions including temperature, area, volume, and derived units to solve problems (MA.8.G.5.1) DOK: High**

### Supporting Idea 6: Number and Operations

#### General Content Limits related to Supporting Idea 6: Number and Operations:
- Whole number addition items should not require the use of more than six addends.
- Whole number addition addends should not exceed six digits.
- Whole number subtraction subtrahends, minuends, and differences should not exceed six digits.
- Whole number division dividends should not exceed five digits.
- Decimal addition items should not require the use of more than six addends.
- Decimal addition addends should not exceed six digits.
- Decimal subtraction subtrahends, minuends, and differences should not exceed six digits.
- Decimal multiplication: See benchmark for specific content limits.
- Decimal division
  - Dividends should not exceed five digits.
  - Quotients should have terminating decimals.
- Fractions items should not require the use of more than three addends or factors.
- Percent: See benchmark for specific content limits.

#### MA.8.A.6.1: Use exponents and scientific notation to write large and small numbers and vice versa and to solve problems.

**Content Limits for MA.8.A.6.1:**
- Items may provide expressions of rational numbers in exponential notation, including negative exponents, and/or numerical or algebraic expressions that contain exponential notation.
- Rational numbers presented as decimals must be terminating decimals.
- Negative exponents may be used in standard scientific notation only.
- Fractions represented in standard scientific notation should be greater than one-billionth.
- Standard scientific notation of whole numbers and decimals is limited to hundred billions through hundred-billionths.


1. **Use exponents and scientific notation to write large and small numbers (Part A of MA.8.A.6.1) DOK: Low**
**Eighth Grade Mathematics Concepts and Skills Checklist Cont. . . .**

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**SUPPORTING IDEA 6: Number and Operations. MA.8.A.6.1 Cont. . . .**

2. Use large and small numbers to write numbers given in exponents and scientific notation (Part B of MA.8.A.6.1) DOK: Low

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3. Use exponents and scientific notation to solve problems (Part C of MA.8.A.6.1) DOK: Low

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**MA.8.A.6.2:** Make reasonable approximations of square roots and mathematical expressions that include square roots, and use them to estimate solutions to problems and to compare mathematical expressions involving real numbers and radical expressions.

**Content Limits for MA.8.A.6.2:**
- Items may include the relationships among fractions, decimals, or numbers expressed as percents, with at least one square root included, given a real-world context.
- The place values of the fractional part of decimal numbers should range from tenths through ten-thousandths.
- Items should require students to determine the effects of operations on real numbers, including addition, subtraction, multiplication, division, exponents, and finding square roots.
- Items that require determining inverses may include adding, subtracting, multiplying, dividing, squaring, and extracting roots.
- Items may include simplified expressions using integers, exponents, radicals, and ratios; large and small numbers in standard scientific notation; or absolute values.
- Numbers may exceed the limits specified in the General Content Limits by Grade Level section when the numbers are represented in word form (e.g., fifty billion) or as denominate numbers (e.g., 4.3 trillion).
- Negative exponents should be used in standard scientific notation only.
- Items may contain multiple forms of a given value.

4. Make reasonable approximations of square roots and mathematical expressions that include square roots (Part A of MA.8.A.6.2) DOK: Moderate

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5. Use reasonable approximations of square roots and mathematical expressions that include square roots to estimate solutions to problems involving real numbers and radical expressions (Part B of MA.8.A.6.2) DOK: Moderate

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6. Use reasonable approximations of square roots and mathematical expressions that include square roots to compare mathematical expressions involving real numbers and radical expressions (Part C of MA.8.A.6.2) DOK: Moderate

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**MA.8.A.6.3:** Simplify real number expressions using the laws of exponents.

7. Simplify real number expressions using the laws of exponents (MA.8.A.6.3) DOK: Moderate

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**SUPPORTING IDEA 6: Number and Operations Cont. …**

MA.8.A.6.4: Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, and irrational numbers) using multi-step and real world problems.

Content Limits for MA.8.A.6.4:
- Items will include the effects of the four basic operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, and irrational numbers), and the use of properties of real numbers to solve problems (commutative, associative, distributive, identity, equality, and the inverse relationship of rational numbers).
- Items may involve simplifying expressions using integers and exponents.
- Items may include performing operations involving fractions, decimals, irrational numbers, numbers expressed as radicals, percents, absolute values, or scientific notation.
- Radicals used in items must be square roots with a radical less than or equal to 100, or cube roots of perfect cubes.
- Also assesses MA.8.A.6.3.

8. Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, and irrational numbers) using multi-step and real world problems (MA.8.A.6.4) DOK: High

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