

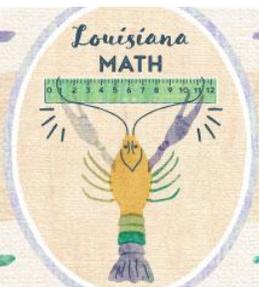
# Louisiana Guide to Implementing Carnegie Algebra II

To assist teachers with the implementation of the Carnegie curriculum for Algebra II, this document provides multiple layers of guidance regarding how Carnegie lessons correlate with the Louisiana Student Standards for Mathematics (LSSM). Carnegie is a focused, coherent math curriculum that provides ample instructional guidance for teachers. This Louisiana Guide to Implementing Carnegie goes a step further to point out places in which teachers may need to make strategic decisions considering student needs and time availability by offering a suggested pacing calendar, highlighting the prerequisite standards and grade level standards by unit, detailing standards by lesson, and showcasing the alignment to the Louisiana Student Standards for Mathematics.

The guidance document is considered a “living” document. We believe that educators will find ways to make improvements to the guidance document as they use it. Please send feedback to [STEM@la.gov](mailto:STEM@la.gov).

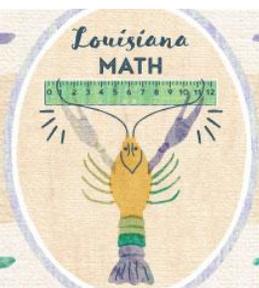
Updated on July 20, 2023





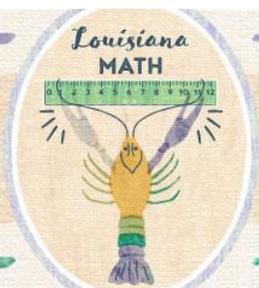
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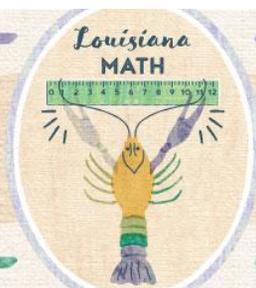


## Algebra II Suggested Implementation Calendar

Algebra II	Unit	Approximate Number of Days	Number of Lessons
Weeks 1-4	Unit 1: Analyzing Structure Topic 1: Exploring and Analyzing Patterns	19 Days	6 Lessons / 1 MATHia
Weeks 5-6	Unit 1: Analyzing Structure Topic 2: Composing and Decomposing Functions	10 Days	4 Lessons / 1 MATHia
Weeks 7-9	Unit 1: Analyzing Structure Topic 3: Characteristics of Polynomial Functions	13 Days	6 Lessons / 1 MATHia
Week 10	Unit 1 Flex Days	6 Days	
Week 11	Unit 2: Developing Structural Similarities Topic 1: Relating Factors and Zeros	6 Days	4 Lessons / 1 MATHia
Week 12	Unit 2: Developing Structural Similarities Topic 2: Polynomial Models	3 Days	3 Lessons / 1 MATHia
Weeks 12-14	Unit 2: Developing Structural Similarities Topic 3: Rational Functions	12 Days	6 Lessons / 1 MATHia
Week 15	Unit 2 Flex Days	6 Days	
Weeks 16-18	Unit 3: Inverting Functions Topic 1: Radical Functions	13 Days	5 Lessons / 1 MATHia



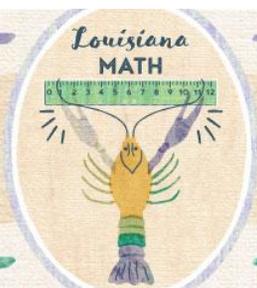
Weeks 19-20	Unit 3: Inverting Functions Topic 2: Exponential and Logarithmic Functions	10 Days	4 Lessons / 1 MATHia
Weeks 21-22	Unit 3: Inverting Functions Topic 3: Exponential and Logarithmic Equations	10 Days	5 Lessons / 1 MATHia
Weeks 23-24	Unit 3: Inverting Functions Topic 4: Applications of Growth Modeling	7 Days	3 Lessons / 1 MATHia
Weeks 24-25	Unit 3 Flex Days	6 Days	
Weeks 26-27	ACT REVIEW / STATE TEST	11 Days	
Weeks 28-29	Unit 4: Investigating Periodic Functions Topic 1: Trigonometric Relationships	9 Days	5 Lessons / 1 MATHia
Weeks 30-31	Unit 4: Investigating Periodic Functions Topic 2: Trigonometric Equations	9 Days	5 Lessons / 1 MATHia
Week 32	Unit 4 Flex Days	6 Days	
Week 33	Unit 5: Relating Data and Decisions Topic 1: Interpreting Data in Normal Distributions	7 Days	4 Lessons / 1 MATHia
Weeks 34-35	Unit 5: Relating Data and Decisions Topic 2: Making Inferences and Justifying Conclusions	11 Days	5 Lessons / 1 MATHia
Week 36	Unit 5 Flex Days	6 Days	



## Alignment to Louisiana Student Standards for Mathematics

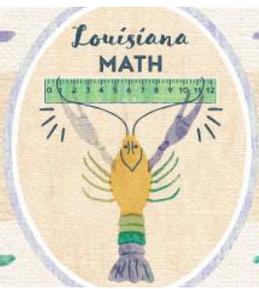
### Focus in the Standards

Not all content at given grades is emphasized equally in the standards. Some clusters require greater emphasis than others based on the depth of ideas, the time that they take to master, and/or their importance to future mathematics or the demands of college and career readiness. More time in these areas is also necessary for students to meet the Louisiana Standards for Mathematical Practices. To say that some things have greater emphasis is not to say that anything in the standards can safely be neglected in instruction. Neglecting material will leave gaps in student skill and understanding and may leave students unprepared for the challenges of a later grade. Students should spend the large majority of their time on the major work on the grade (■). Supporting work (▣) and, where appropriate, additional work (●) can engage students in the major work of the grade.

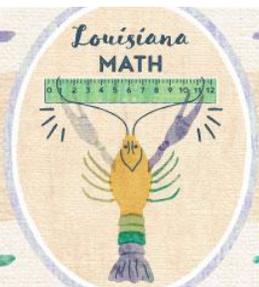


## Algebra II: Standards by Unit

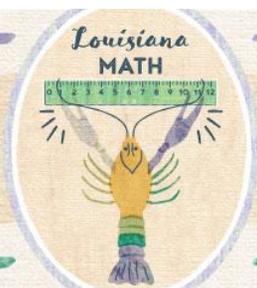
Unit 1 Topic 1	Unit 1 Topic 2	Unit 1 Topic 3	Unit 2 Topic 1	Unit 2 Topic 2	Unit 2 Topic 3
<ul style="list-style-type: none"> <li>○ N-CN.A.1</li> <li>○ N-CN.A.2</li> <li>○ N-CN.C.7</li> <li>■ A-SSE.A.2</li> <li>■ A-CED.A.1</li> <li>■ A-REI.B.4</li> <li>■ A-REI.B.4b</li> <li>○ A-REI.C.6</li> <li>○ A-REI.C.7</li> <li>■ F-IF.B.4</li> <li>■ F-IF.C.8</li> <li>■ F-IF.C.9</li> <li>■ F-BF.A.1</li> <li>■ F-BF.A.1a</li> <li>○ F-BF.B.3</li> </ul>	<ul style="list-style-type: none"> <li>■ A-APR.B.3</li> <li>■ A-REI.D.11</li> <li>■ F-IF.B.4</li> <li>■ F-IF.C.7c</li> <li>■ F-BF.A.1b</li> <li>○ F-BF.B.3</li> </ul>	<ul style="list-style-type: none"> <li>■ A-APR.B.3</li> <li>■ A-REI.D.11</li> <li>■ F-IF.B.4</li> <li>■ F-IF.B.6</li> <li>■ F-IF.C.7c</li> <li>■ F-IF.C.9</li> <li>■ F-BF.A.1b</li> <li>○ F-BF.B.3</li> </ul>	<ul style="list-style-type: none"> <li>■ A-SSE.A.2</li> <li>■ A-APR.B.2</li> <li>■ A-APR.B.3</li> <li>■ A-CED.A.1</li> </ul>	<ul style="list-style-type: none"> <li>○ A-APR.C.4</li> <li>■ F-IF.B.4</li> <li>■ S-ID.B.6a</li> </ul>	<ul style="list-style-type: none"> <li>■ A-SSE.A.2</li> <li>■ A-APR.D.6</li> <li>■ A-CED.A.1</li> <li>■ A-REI.A.1</li> <li>■ A-REI.A.2</li> <li>■ A-REI.D.11</li> <li>○ F-BF.B.3</li> </ul>
<p>Prerequisite Standards:</p> <ul style="list-style-type: none"> <li>■ 7.EE.A.1</li> <li>■ 8.EE.A.2</li> <li>■ A1:N-Q.A.1</li> <li>■ A1:A-SSE.A.1</li> <li>■ A1:A-SSE.A.2</li> <li>■ A1:A-CED.A.1</li> </ul>	<p>Prerequisite Standards:</p> <ul style="list-style-type: none"> <li>■ A1:N-Q.A.1</li> <li>■ A1:A-SSE.B.3</li> <li>■ A1:A-APR.B.3</li> <li>■ A1:A-REI.D.11</li> <li>■ A1:F-IF.A.1</li> <li>■ A1:F-IF.B.4</li> </ul>	<p>Prerequisite Standards:</p> <ul style="list-style-type: none"> <li>■ A1:N-Q.A.1</li> <li>■ A1:A-SSE.B.3</li> <li>■ A1:A-APR.B.3</li> <li>■ A1:A-REI.D.11</li> <li>■ A1:F-IF.A.1</li> <li>■ A1:F-IF.A.2</li> </ul>	<p>Prerequisite Standards:</p> <ul style="list-style-type: none"> <li>■ A1:A-SSE.A.1</li> <li>■ A1:A-SSE.A.2</li> <li>■ A1:A-SSE.B.3</li> <li>■ A1:A-APR.B.3</li> <li>■ A1:A-CED.A.1</li> <li>■ A1:A-REI.B.4</li> </ul>	<p>Prerequisite Standards:</p> <ul style="list-style-type: none"> <li>■ A1:N-Q.A.1</li> <li>■ A1:F-IF.A.1</li> <li>■ A1:F-IF.B.4</li> <li>■ A1:S-ID.B.6</li> </ul>	<p>Prerequisite Standards:</p> <ul style="list-style-type: none"> <li>■ 7.NS.A.2</li> <li>■ A1:A-SSE.A.1</li> <li>■ A1:A-SSE.A.2</li> <li>■ A1:A-CED.A.1</li> <li>■ A1:A-REI.A.1</li> <li>■ A1:A-REI.B.4</li> </ul>



<ul style="list-style-type: none"> <li>■ A1:A-REI.B.4</li> <li>● A1:A-REI.C.6</li> <li>■ A1:F-IF.A.1</li> <li>■ A1:F-IF.B.4</li> <li>■ A1:F-IF.C.8</li> <li>■ A1:F-IF.C.9</li> <li>■ A1:F-BF.A.1</li> <li>● A1:F-BF.B.3</li> </ul>	<ul style="list-style-type: none"> <li>■ A1:F-IF.C.7</li> <li>■ A1:F-IF.C.8</li> <li>■ A1:F-BF.A.1</li> <li>● A1:F-BF.B.3</li> </ul>	<ul style="list-style-type: none"> <li>■ A1:F-IF.B.4</li> <li>■ A1:F-IF.B.6</li> <li>■ A1:F-IF.C.7</li> <li>■ A1:F-IF.C.8</li> <li>■ A1:F-BF.A.1</li> <li>● A1:F-BF.B.3</li> </ul>			<ul style="list-style-type: none"> <li>■ A1:A-REI.D.11</li> <li>● A1:F-BF.B.3</li> </ul>
Unit 3 Topic 1	Unit 3 Topic 2	Unit 3 Topic 3	Unit 3 Topic 4	Unit 4 Topic 1	Unit 4 Topic 2
<ul style="list-style-type: none"> <li>■ N-RN.A.1</li> <li>■ N-RN.A.2</li> <li>■ F-IF.B.4</li> <li>■ F-IF.C.7b</li> <li>■ F-IF.C.9</li> <li>● F-BF.B.3</li> <li>● F-BF.B.4</li> <li>● F-BF.B.4a</li> </ul>	<ul style="list-style-type: none"> <li>■ A-SSE.B.3c</li> <li>■ A-REI.D.11</li> <li>■ F-IF.B.4</li> <li>■ F-IF.C.7e</li> <li>■ F-IF.C.8b</li> <li>● F-BF.B.3</li> <li>● F-BF.B.4a</li> <li>● F-LE.B.5</li> </ul>	<ul style="list-style-type: none"> <li>■ A-REI.D.11</li> <li>■ F-LE.A.2</li> <li>■ F-LE.A.4</li> </ul>	<ul style="list-style-type: none"> <li>■ A-SSE.B.4</li> <li>■ F-IF.C.7</li> <li>■ F-IF.C.7b</li> <li>■ F-IF.C.7c</li> <li>■ F-IF.C.7e</li> <li>■ F-BF.A.1a</li> <li>■ F-BF.A.2</li> </ul>	<ul style="list-style-type: none"> <li>■ N-Q.A.2</li> <li>■ F-IF.B.4</li> <li>■ F-IF.C.7e</li> <li>● F-BF.B.3</li> <li>● F-TF.A.1</li> <li>● F-TF.A.2</li> <li>● F-TF.B.5</li> </ul>	<ul style="list-style-type: none"> <li>■ A-SSE.A.2</li> <li>■ A-REI.A.1</li> <li>■ F-IF.B.4</li> <li>● F-TF.A.1</li> <li>● F-TF.A.2</li> <li>● F-TF.B.5</li> <li>● F-TF.C.8</li> </ul>
Prerequisite Standards:	Prerequisite Standards:	Prerequisite Standards:	Prerequisite Standards:	Prerequisite Standards:	Prerequisite Standards:
<ul style="list-style-type: none"> <li>■ 8.EE.A.1</li> <li>■ 8.EE.A.2</li> <li>■ A1:N-Q.A.1</li> <li>■ A1:F-IF.A.1</li> <li>■ A1:F-IF.B.4</li> <li>■ A1:F-IF.C.9</li> </ul>	<ul style="list-style-type: none"> <li>■ A1:N-Q.A.1</li> <li>■ A1:A-SSE.B.3</li> <li>■ A1:A-REI.D.11</li> <li>■ A1:F-IF.A.1</li> <li>■ A1:F-IF.B.4</li> <li>■ A1:F-IF.C.8</li> </ul>	<ul style="list-style-type: none"> <li>■ A1:A-REI.D.11</li> <li>■ A1:F-LE.A.1</li> <li>■ A1:F-LE.A.2</li> </ul>	<ul style="list-style-type: none"> <li>■ A1:A-APR.B.3</li> <li>■ A1:F-IF.A.1</li> <li>■ A1:F-IF.C.7</li> <li>■ A1:F-IF.C.8</li> <li>■ A1:F-BF.A.1</li> </ul>	<ul style="list-style-type: none"> <li>■ A1:N-Q.A.1</li> <li>■ A1:N-Q.A.2</li> <li>■ A1:F-IF.A.1</li> <li>■ A1:F-IF.B.4</li> <li>■ A1:F-IF.C.7</li> <li>■ A1:F-IF.C.8</li> </ul>	<ul style="list-style-type: none"> <li>■ A1:N-Q.A.1</li> <li>■ A1:A-SSE.A.1</li> <li>■ A1:A-SSE.A.2</li> <li>■ A1:A-REI.A.1</li> <li>■ A1:F-IF.A.1</li> <li>■ A1:F-IF.B.4</li> </ul>



<ul style="list-style-type: none"> <li>● A1:F-BF.B.3</li> </ul>	<ul style="list-style-type: none"> <li>● A1:F-BF.B.3</li> <li>■ A1:F-LE.B.5</li> </ul>			<ul style="list-style-type: none"> <li>● A1:F-BF.B.3</li> <li>● GM:G-C.B.5</li> <li>■ GM:G-SRT.C.8</li> <li>● GM:G-GPE.A.1</li> </ul>	<ul style="list-style-type: none"> <li>● GM:G-C.B.5</li> <li>■ GM:G-SRT.C.8</li> <li>● GM:G-GPE.A.1</li> </ul>
<b>Unit 5 Topic 1</b>	<b>Unit 5 Topic 2</b>				
<ul style="list-style-type: none"> <li>● S-ID.A.4</li> </ul>	<ul style="list-style-type: none"> <li>● S-ID.A.4</li> <li>■ S-IC.A.1</li> <li>■ S-IC.A.2</li> <li>■ S-IC.B.3</li> <li>■ S-IC.B.4</li> <li>■ S-IC.B.5</li> <li>■ S-IC.B.6</li> </ul>				
Prerequisite Standards: <ul style="list-style-type: none"> <li>● 6.SP.B.5</li> <li>● A1:S-ID.A.2</li> </ul>	Prerequisite Standards: <ul style="list-style-type: none"> <li>● 6.SP.B.5</li> <li>■ 7.SP.A.2</li> <li>■ 7.SP.C.7</li> <li>● A1:S-ID.A.2</li> </ul>				

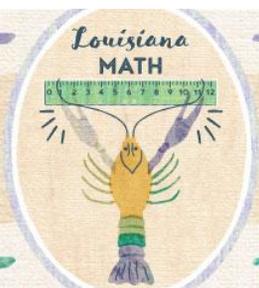


## Standards by Lesson

Algebra II: Standards by Lesson	
Unit 1 Topic 1 Lessons	Standards
1	▣ F-IF.C.8
2	▣ A-CED.A.1, ■ F-IF.B.4, ▣ F-IF.C.8, ■ F-BF.A.1a
3	▣ A-CED.A.1, ▣ F-IF.C.8, ▣ F-IF.C.9
4	■ A-SSE.A.2, ▣ A-CED.A.1, ■ F-IF.B.4, ▣ F-IF.C.9, ■ F-BF.A.1
5	▣ A-REI.B.4, ▣ A-REI.B.4b, ● A-REI.C.6, ● A-REI.C.7
6	● N-CN.A.1, ● N-CN.A.2, ● N-CN.C.7, ▣ A-REI.B.4b
MATHia	■ A-SSE.A.2, ▣ A-REI.B.4b, ■ F-IF.B.4, ● F-BF.B.3

Unit 1 Topic 2 Lessons	Standards
1	■ A-APR.B.3, ■ A-REI.D.11, ■ F-BF.A.1b
2	▣ F-IF.C.7c, ● F-BF.B.3
3	■ F-IF.B.4, ▣ F-IF.C.7c
4	■ A-APR.B.3, ▣ F-IF.C.7c
MATHia	■ A-APR.B.3, ■ F-IF.B.4, ■ F-BF.A.1b
Unit 1 Topic 3 Lessons	Standards
1	▣ F-IF.C.7c, ● F-BF.B.3
2	● F-BF.B.3
3	■ A-APR.B.3, ■ F-IF.B.4
4	■ A-APR.B.3, ▣ F-IF.C.7c, ■ F-BF.A.1b

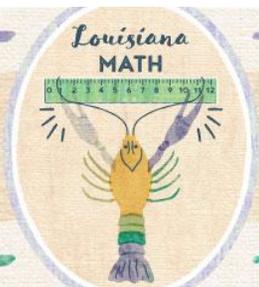
5	■ A-REI.D.11, ■ F-IF.B.4, ■ F-IF.B.6
6	▣ F-IF.C.9
MATHia	■ A-APR.B.3, ■ F-IF.B.6
Unit 2 Topic 1 Lessons	Standards
1	■ A-SSE.A.2, ■ A-APR.B.2, ■ A-APR.B.3
2	■ A-SSE.A.2
3	■ A-SSE.A.2
4	▣ A-CED.A.1
MATHia	Skip lesson
Unit 2 Topic 2 Lessons	Standards
1	● A-APR.C.4
2	Skip lesson



3	■ F-IF.B.4, ■ S-ID.B.6a
MATHia	Skip lesson
<b>Unit 2 Topic 3 Lessons</b>	<b>Standards</b>
1	Skip lesson
2	● F-BF.B.3 (optional skip)
3	■ A-APR.D.6
4	■ A-SSE.A.2, ■ A-APR.D.6
5	■ A-SSE.A.2, ■ A-CED.A.1, ■ A-REI.A.1, ■ A-REI.A.2, ■ A-REI.D.11
6	■ A-CED.A.1, ■ A-REI.A.1, ■ A-REI.A.2
MATHia	■ A-APR.D.6, ■ A-CED.A.1, ■ A-REI.A.2
<b>Unit 3 Topic 1 Lessons</b>	<b>Standards</b>
1	■ F-IF.B.4, ■ F-IF.C.7b

2	■ F-IF.B.4, ■ F-IF.C.7b, ● F-BF.B.4a
3	■ F-IF.C.7b, ■ F-IF.C.9, ● F-BF.B.3
4	■ N-RN.A.1, ■ N-RN.A.2
5	■ N-RN.A.2
MATHia	■ F-IF.C.7b, ● F-BF.B.4, ● F-BF.B.4a, ■ N-RN.A.1, ■ N-RN.A.2
<b>Unit 3 Topic 2 Lessons</b>	<b>Standards</b>
1	■ A-REI.D.11, ■ F-IF.B.4, ■ F-IF.C.8b, ● F-LE.B.5
2	■ A-REI.D.11, ■ F-IF.B.4, ■ F-IF.C.7e, ● F-BF.B.4a
3	■ F-IF.B.4, ■ F-IF.C.7e, ● F-BF.B.4a
4	■ A-SSE.B.3c, ● F-BF.B.3
MATHia	■ F-IF.C.7e

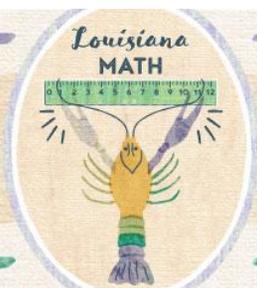
<b>Unit 3 Topic 3 Lessons</b>	<b>Standards</b>
1	■ F-LE.A.4
2	■ F-LE.A.4
3	■ A-REI.D.11, ■ F-LE.A.4
4	■ F-LE.A.4
5	■ F-LE.A.2, ■ F-LE.A.4
MATHia	■ F-LE.A.4
<b>Unit 3 Topic 4 Lessons</b>	<b>Standards</b>
1	■ A-SSE.B.4, ■ F-BF.A.2
2	■ F-IF.C.7, ■ F-IF.C.7b, ■ F-IF.C.7c, ■ F-IF.C.7e
3	■ F-BF.A.1a, ■ F-BF.A.2
MATHia	■ A-SSE.B.4



Unit 4 Topic 1 Lessons	Standards
1	<span style="color: blue;">■</span> N-Q.A.2, <span style="color: green;">■</span> F-IF.B.4, <span style="color: blue;">■</span> F-IF.C.7e
2	<span style="color: yellow;">●</span> F-TF.A.1
3	<span style="color: blue;">■</span> F-IF.C.7e, <span style="color: yellow;">●</span> F-TF.A.2
4	<span style="color: yellow;">●</span> F-BF.B.3, <span style="color: yellow;">●</span> F-TF.B.5
5	<span style="color: green;">■</span> F-IF.B.4, <span style="color: blue;">■</span> F-IF.C.7e
MATHia	<span style="color: yellow;">●</span> F-TF.A.1, <span style="color: yellow;">●</span> F-TF.A.2, <span style="color: yellow;">●</span> F-TF.B.5
Unit 4 Topic 2 Lessons	Standards
1	<span style="color: yellow;">●</span> F-TF.C.8

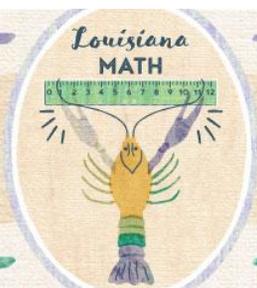
2	<span style="color: green;">■</span> A-SSE.A.2, <span style="color: green;">■</span> A-REI.A.1, <span style="color: yellow;">●</span> F-TF.A.1, <span style="color: yellow;">●</span> F-TF.A.2
3	<span style="color: green;">■</span> F-IF.B.4, <span style="color: yellow;">●</span> F-TF.B.5
4	<span style="color: yellow;">●</span> F-TF.B.5
5	<span style="color: green;">■</span> F-IF.B.4, <span style="color: yellow;">●</span> F-TF.B.5
MATHia	<span style="color: yellow;">●</span> F-TF.C.8
Unit 5 Topic 1 Lessons	Standards
1	<span style="color: yellow;">●</span> S-ID.A.4
2	<span style="color: yellow;">●</span> S-ID.A.4
3	<span style="color: yellow;">●</span> S-ID.A.4
4	<span style="color: yellow;">●</span> S-ID.A.4
MATHia	<span style="color: yellow;">●</span> S-ID.A.4

Unit 5 Topic 2 Lessons	Standards
1	<span style="color: blue;">■</span> S-IC.A.1, <span style="color: green;">■</span> S-IC.B.3
2	<span style="color: blue;">■</span> S-IC.A.1, <span style="color: green;">■</span> S-IC.B.3
3	<span style="color: blue;">■</span> S-IC.A.1, <span style="color: green;">■</span> S-IC.B.4, <span style="color: green;">■</span> S-IC.B.6
4	<span style="color: blue;">■</span> S-IC.A.1, <span style="color: blue;">■</span> S-IC.A.2, <span style="color: green;">■</span> S-IC.B.4, <span style="color: green;">■</span> S-IC.B.5, <span style="color: green;">■</span> S-IC.B.6
5	<span style="color: blue;">■</span> S-IC.A.1, <span style="color: blue;">■</span> S-IC.A.2, <span style="color: green;">■</span> S-IC.B.3, <span style="color: green;">■</span> S-IC.B.4, <span style="color: green;">■</span> S-IC.B.5, <span style="color: green;">■</span> S-IC.B.6
MATHia	<span style="color: yellow;">●</span> S-ID.A.4

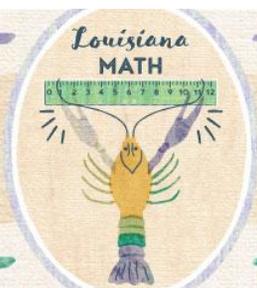


## Louisiana Alignment

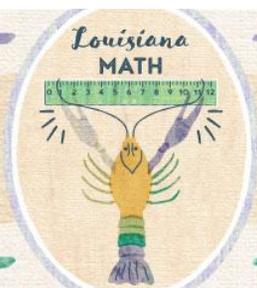
Standard Code	Standard Language	Aligned Lessons
■ A2: N-RN.A.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. <i>For example, we define <math>5^{1/3}</math> to be the cube root of 5 because we want <math>(5^{1/3})^3 = 5^{(1/3)3}</math> to hold, so <math>(5^{1/3})^3</math> must equal 5.</i>	Unit 3 Topic 1
■ A2: N-RN.A.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.	Unit 3 Topic 1
▣ A2: N-Q.A.2	Define appropriate quantities for the purpose of descriptive modeling.*	Unit 4 Topic 1
● A2: N-CN.A.1	Know there is a complex number $i$ such that $i^2 = -1$ , and every complex number has the form $a + bi$ with $a$ and $b$ real.	Unit 1 Topic 1
● A2: N-CN.A.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.	Unit 1 Topic 1
● A2: N-CN.C.7	Solve quadratic equations with real coefficients that have complex solutions.	Unit 1 Topic 1
■ A2: A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it. <i>For example, see <math>x^4 - y^4</math> as <math>(x^2)^2 - (y^2)^2</math>, thus recognizing it as a difference of squares that can be factored as <math>(x^2 - y^2)(x^2 + y^2)</math>.</i>	Unit 1 Topic 1 Unit 2 Topic 1 Unit 2 Topic 3 Unit 4 Topic 2
■ A2: A-SSE.B.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.*	Unit 3 Topic 2



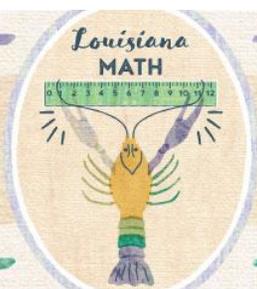
■ A2: A-SSE.B.3c	Use the properties of exponents to transform expressions for exponential functions. <i>For example the expression <math>1.15^t</math> can be rewritten as <math>(1.15^{1/12})^{12t} \approx 1.012^{12t}</math> to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.*</i>	Unit 3 Topic 2
■ A2: A-SSE.B.4	Apply the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. <i>For example, calculate mortgage payments.*</i>	Unit 3 Topic 4
■ A2: A-APR.B.2	Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number $a$ , the remainder on division by $x - a$ is $p(a)$ , so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$ .	Unit 2 Topic 1
■ A2: A-APR.B.3	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	Unit 1 Topic 2 Unit 1 Topic 3 Unit 2 Topic 1
● A2: A-APR.C.4	Use polynomial identities and use them to describe numerical relationships. <i>For example, the polynomial identity <math>(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2</math> can be used to generate Pythagorean triples.</i>	Unit 2 Topic 2
■ A2: A-APR.D.6	Rewrite simple rational expressions in different forms; write $\frac{a(x)}{b(x)}$ in the form $q(x) + \frac{r(x)}{b(x)}$ , where $a(x)$ , $b(x)$ , $q(x)$ , and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$ , using inspection, long division, or, for the more complicated examples, a computer algebra system.	Unit 2 Topic 3
■ A2: A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems. <i>Include equations arising from linear and quadratic functions, and simple rational and exponential functions.*</i>	Unit 1 Topic 1 Unit 2 Topic 1 Unit 2 Topic 3
■ A2: A-REI.A.1	Explain each step in solving an equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	Unit 2 Topic 3 Unit 4 Topic 2



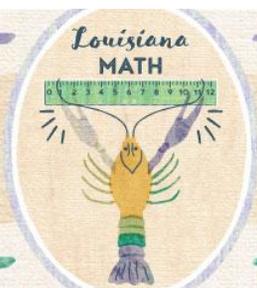
■ A2: A-REI.A.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	Unit 2 Topic 3
■ A2: A-REI.B.4	Solve quadratic equations in one variable.	Unit 1 Topic 1
■ A2: A-REI.B.4b	Solve quadratic equations by inspection (e.g., for $x^2 = 49$ ), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers $a$ and $b$ .	Unit 1 Topic 1
● A2: A-REI.C.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), limited to systems of at most three equations and three variables. With graphic solutions, systems are limited to two variables.	Unit 1 Topic 1
● A2: A-REI.C.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. <i>For example, find the points of intersection between the line <math>y = -3x</math> and the circle <math>x^2 + y^2 = 3</math>.</i>	Unit 1 Topic 1
■ A2: A-REI.D.11	Explain why the $x$ -coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$ ; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.*	Unit 1 Topic 2 Unit 1 Topic 3 Unit 2 Topic 3 Unit 3 Topic 2 Unit 3 Topic 3
■ A2: F-IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. <i>Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*</i>	Unit 1 Topic 1 Unit 1 Topic 2 Unit 1 Topic 3 Unit 2 Topic 2 Unit 3 Topic 1 Unit 3 Topic 2 Unit 4 Topic 1 Unit 4 Topic 2



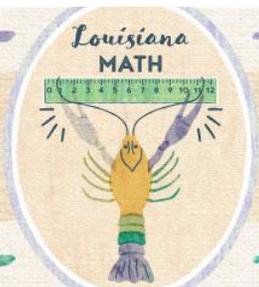
■ A2: F-IF.B.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. *	Unit 1 Topic 3
■ A2: F-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. *	Unit 3 Topic 4
■ A2: F-IF.C.7b	Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. *	Unit 3 Topic 1 Unit 3 Topic 4
■ A2: F-IF.C.7c	Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. *	Unit 1 Topic 2 Unit 1 Topic 3 Unit 3 Topic 4
■ A2: F-IF.C.7e	Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. *	Unit 3 Topic 2 Unit 3 Topic 4 Unit 4 Topic 1
■ A2: F-IF.C.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.	Unit 1 Topic 1
■ A2: F-IF.C.8b	Use the properties of exponents to interpret expressions for exponential functions. <i>For example, identify percent rate of change in functions such as <math>y = (1.02)^t</math>, <math>y = (0.97)^t</math>, <math>y = (1.01)12^t</math>, <math>y = (1.2)^t/10</math>, and classify them as representing exponential growth or decay.</i>	Unit 3 Topic 2
■ A2: F-IF.C.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). <i>For example, given a graph of one quadratic function and an algebraic expression for another, determine which has the larger maximum</i>	Unit 1 Topic 1 Unit 1 Topic 3 Unit 3 Topic 1
■ A2: F-BF.A.1	Write a function that describes a relationship between two quantities. *	Unit 1 Topic 1



■ A2: F-BF.A.1a	Determine an explicit expression, a recursive process, or steps for calculation from a context. *	Unit 1 Topic 1 Unit 3 Topic 4
■ A2: F-BF.A.1b	Combine standard function types using arithmetic operations. <i>For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.</i> *	Unit 1 Topic 2 Unit 1 Topic 3
■ A2: F-BF.A.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. *	Unit 3 Topic 4
○ A2: F-BF.B.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$ , $k f(x)$ , $f(kx)$ , and $f(x + k)$ for specific values of $k$ (both positive and negative); find the value of $k$ given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.	Unit 1 Topic 1 Unit 1 Topic 2 Unit 1 Topic 3 Unit 2 Topic 3 Unit 3 Topic 1 Unit 3 Topic 2 Unit 4 Topic 1
○ A2: F-BF.B.4	Find inverse functions.	Unit 3 Topic 1
○ A2: F-BF.B.4a	Solve an equation of the form $f(x) = c$ for a simple function $f$ that has an inverse and write an expression for the inverse. <i>For example, <math>f(x) = 2x^3</math> or <math>f(x) = (x+1)/(x-1)</math> for <math>x \neq 1</math>.</i>	Unit 3 Topic 1 Unit 3 Topic 2
■ A2: F-LE.A.2	Given a graph, a description of a relationship, or two input-output pairs (include reading these from a table), construct linear and exponential functions, including arithmetic and geometric sequences to solve multistep problems. *	Unit 3 Topic 3
■ A2: F-LE.A.4	For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where $a$ , $c$ , and $d$ are numbers and the base $b$ is 2, 10, or $e$ ; evaluate the logarithm using technology. *	Unit 3 Topic 3
○ A2: F-LE.B.5	Interpret the parameters in a linear or exponential function in terms of a context. *	Unit 3 Topic 2



○ A2: F-TF.A.1	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.	Unit 4 Topic 1 Unit 4 Topic 2
○ A2: F-TF.A.2	Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.	Unit 4 Topic 1 Unit 4 Topic 2
○ A2: F-TF.B.5	Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.*	Unit 4 Topic 1 Unit 4 Topic 2
○ A2: F-TF.C.8	Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$ , $\cos(\theta)$ , or $\tan(\theta)$ given $\sin(\theta)$ , $\cos(\theta)$ , or $\tan(\theta)$ and the quadrant of the angle.	Unit 4 Topic 2
○ A2: S-ID.A.4	Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.*	Unit 5 Topic 1 Unit 5 Topic 2
▣ A2: S-ID.B.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.*	Unit 2 Topic 2
▣ A2: S-ID.B.6a	Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize exponential models.*	Unit 2 Topic 2
▣ A2: S-IC.A.1	Understand statistics as a process for making inferences about population parameters based on a random sample from that population.*	Unit 5 Topic 2
▣ A2: S-IC.A.2	Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. <i>For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?*</i>	Unit 5 Topic 2



■ A2: S-IC.B.3	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each. *	Unit 5 Topic 2
■ A2: S-IC.B.4	Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling. *	Unit 5 Topic 2
■ A2: S-IC.B.5	Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant. *	Unit 5 Topic 2
■ A2: S-IC.B.6	Evaluate reports based on data. *	Unit 5 Topic 2

# Carnegie Learning Family Resources

Carnegie Learning offers robust Family Resources for all of our programs.

## Family Guides

- Where have we been?
- Where are we going?
- Myths
- Talking Points
- Questions to ask
- Some things to look for
- Key terms

**FAMILY GUIDE**  
Read and share with your student.

**CARNEGIE LEARNING**

### How to support your student as they learn about Factors and Multiples

Mathematics is a connected set of ideas, and your student knows a lot. Encourage them to use the mathematics they already know when encountering new concepts in this topic.

**Where are we?**

MODULE 1 Composing and Decomposing  
 TOPIC 1 Factors and Multiples  
 TOPIC 2 Area, Volume, and Surface Area  
 TOPIC 3 Decimals

In this MATHbook topic, students take apart numbers and shapes to formalize the Distributive Property. They use the lowest common multiple (LCM) and the greatest common factor (GCF) of number pairs to solve problems. Finally, students review fraction multiplication before learning to divide fractions by fractions.

**Where have we been?**  
 Students have used tiling to relate area to multiplication and addition, and they have used informal statements of the number properties. Students have also used area models to represent multiplication.

**Where are we going?**  
 In the next topic, students will use their knowledge of rectangles and area to develop the area formulas for parallelograms, triangles, and trapezoids. They will continue to build fluency with fractions throughout the course.

**MATHia**

Encourage your students to work through the sequence of MATHia assigned to them. These workspaces deepen their understanding and provide practice with the concepts of **Factors and Multiples**.

**Writing Equivalent Expressions Using the Distributive Property**

- Commutative and Associative Properties
- Exploring the Distributive Property with Numeric Expressions
- Using the Distributive Property with Numeric Expressions

**Identifying Common Factors and Multiples**

- Prime Factorization
- Determining GCF and LCM
- Using the GCF to Rewrite the Sum of Two Numbers

**Multiplying Fractions**

- Multiplying by Fractions to Increase or Decrease Quantities

**Fraction by Fraction Division**

- Representing Fraction Division
- Interpreting Remainders Using Models
- Developing the Fraction Division Algorithm
- Multiplying and Dividing Rational Numbers

**ONLINE RESOURCES FOR FAMILIES**  
[www.carnegielearning.com/home-connection](http://www.carnegielearning.com/home-connection)

**MARK YOUR CALENDAR**  
 End of Topic Test:

MATHbook Course 1  
 Module 1 > Topic 1 > Family Guide 1

**FAMILY GUIDE**  
Read and share with your student.

**CARNEGIE LEARNING**

### How to support your student as they learn

**MATH MYTH**  
**I don't have the math gene.**

Let's be clear about something. There isn't a gene that controls the development of mathematical thinking. Instead, there are probably hundreds of genes that contribute to it.

A recent study suggests that mathematical thinking arises from the ability to learn a language. Given the right input from the environment, children learn to speak without formal instruction. They can learn number sense and pattern recognition the same way.

To further nurture your child's mathematical growth, attend to the learning environment. You can think of it as providing a nutritious mathematical diet that includes: discussing math in the real world, offering encouragement, being available to answer questions, allowing your student to struggle with difficult concepts, and providing space for plenty of practice.

#mathmythbusted

### Talking Points

**Discuss With Your Student**

Your student is learning to compose and decompose numbers using different techniques. You can further support your student's learning by asking questions about the work they do in class or at home.

**Questions to Ask**

- How does this problem look like something you did in class?
- Can you show me the strategy you used to solve this problem? Do you know another way to solve it?
- Does your answer make sense? How do you know?
- Is there anything you don't understand? How can you use today's lesson to help?

**KEY TERMS**

**Distributive Property**  
 The Distributive Property states that for any numbers  $a$ ,  $b$ , and  $c$ ,  $a(b + c) = ab + ac$ .

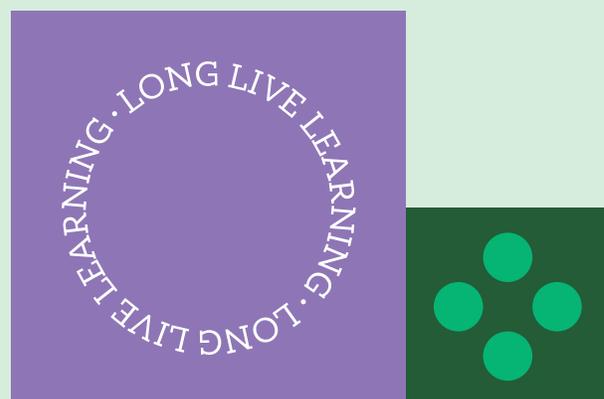
**greatest common factor (GCF)**  
 The GCF is the largest factor two or more numbers have in common.

**least common multiple**  
 The LCM is the smallest multiple (other than zero) that two or more numbers have in common.

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<https://support.carnegielearning.com/help-center>