Appendix A1: Educational Need

Achieving Excellence Academy of Charlotte will serve students residing in economically disadvantaged and racially diverse communities in West Charlotte with a focus on providing enhanced Technology with a rigorous STEAM specialized instruction to support students with learning difficulties,limited English proficiency & or intellectual disabilities to increase student achievement and academic performance.

According to the local education agency Charlotte Mecklenburg School District student enrollment data(2017-2018), approximately 147,359 students had received instruction at a Charlotte Mecklenburg Schools(CMS). It is important to mention that CMS student enrollment numbers are expected to increase significantly each coming year. As a result, class sizes will continue to increase, instructional resources will be scarce,student engagement/ & achievement will decrease and student with learning difficulties, English Language Learners(ELL) and or students with intellectual disabilities will continue to slip through the cracks.

 In the CMS school district, the demographic racial and ethnic data reflects the following student population: 40% African American, 4% American Indian, 6.6% Asian, 24% Hispanic, 4% Multiracial,1% Pacific Islander, 28% White. In addition, there are 197 Native Languages spoken by students attending CMS schools and there are also 183 countries represented by the students attending CMS district. The families within the West Charlotte neighborhoods have an average annual household income of $38,000. In addition, a large percentage of families within West Charlotte require food and nutrition assistance during the school year and summer months which is almost double the entire Mecklenburg county average.

Research suggests that children from low-income families often start school far behind their peers that come from more affluent families, as shown in measures of school readiness. The incidence, depth, duration and timing of poverty all influence a child's educational attainment, along with community characteristics and social networks. One of the key areas influenced by family income is educational outcomes. According to (Ferguson H, Bovaird S, Mueller M, 2007), six poverty-related factors are known to impact child development in general and school readiness in particular. They are the incidence of poverty, the depth of poverty, the duration of poverty, the timing of poverty (eg, age of child), community characteristics (eg, concentration of poverty and crime in neighborhood, and school characteristics) and the impact poverty has on the child's social network. Children from low-income families often do not receive the stimulation and do not learn the social skills required to prepare them for school.

According to Charlotte Mecklenburg School District's Superintendent Clayton Wilcox, (Charlotte Observer,February 2018) white students in Charlotte-Mecklenburg's low-poverty schools have the chance of being educated by top-notch teachers and graduating ready for college. White students made up 29 percent of all CMS students in 2017, but accounted for just over 50 percent of students in low-poverty schools. In

contrast, Black and Hispanic students in high-poverty schools are left behind, especially if they have learning difficulties and or EL Learners. Approximately,36,500 Black and Hispanic students attend high-poverty CMS schools along with 6% Asian students. These students make up 62 % of the student population which is almost 90% of the enrollment in high-poverty schools. It has long been proven that "students who fail to successfully navigate the educational system are less likely to reach top-tier elite career positions, less likely to escape working class positions, and less likely to become upwardly mobile. These students also have an increased risk of poverty" (Friend, Hunter & Fletcher, 2011). These patterns of disparity are currently being perpetuated in West Charlotte.

Furthermore,Superintendent Clayton Wilcox had stated that,"The systems that are in place in this community are failing some of our families and some of our children, and we in CMS are one of those systems".(Charlotte Observer,February 2018). It is clear that the existing educational opportunities do not offer specialized instruction targeted to the education of students with learning difficulties, limited English proficiency and intellectual disabilities. It is important to mention that there are 176 schools within the CMS district and there are only eight K -8 schools; however out of those eight schools, there's only one K-12 school, Achieving Excellence Academy of Charlotte Charter School that specializes in providing explicit instruction & interventions targeted to students with learning difficulties,limited English proficiency and students with intellectual disabilities. Achieving Excellence Academy of Charlotte proposes to provide a unique educational option that will provide specialized interventions to support struggling students in the West Charlotte community to achieve educational excellence.

Reference

Charlotte Observer:Some unpleasant truths' on race, poverty and opportunity revealed in CMS report: www.charlotteobserver.com/news/local/education/article201742304.html February 2018.

Ferguson H, Bovaird S, Mueller M. The impact of poverty on educational outcomes for children. *Paediatrics & Child Health*. 2007;12(8):701-706.

Friend, C.A. Hunter, A.G., Fletcher, A.C. (2011). Parental racial socialization and the academic achievement of African American children: A cultural-ecological approach. Journal of African American Studies, 15, 1, 40-57.

Greenberg, D., Michalopoulos, C. & Robins, P. (2003). A meta-analysis of government sponsored training programs. Industrial and Labor Relations Review, 57(1), 31-53.

1. The following Needs Survey was administered through an email distribution list and via Charlotte Parents meetup group online. The questions and results are listed below.

Survey distributed through Charlotte parents meetup.com

Jeannine (Organizer) sent a message to the Charlotte Parent **member** mailing list (New K-12 Charter School)

Hi everyone,
There's a new K-12 charter school proposing to open in West Charlotte in the year 2020, its called,Achieving Excellence Academy of Charlotte Charter School.The charter school administrators deeply appreciate your input to determine the need for this school.
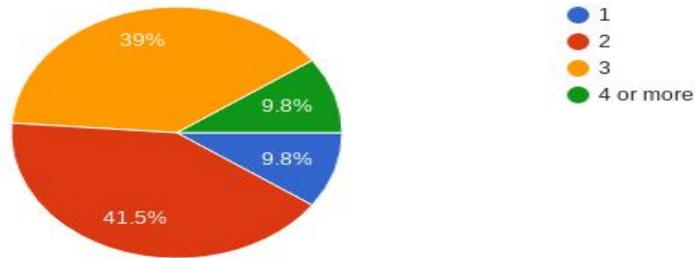_____

Do you feel that the current school system is meeting the needs of ALL students,specifically students with learning difficulties?

41 responses

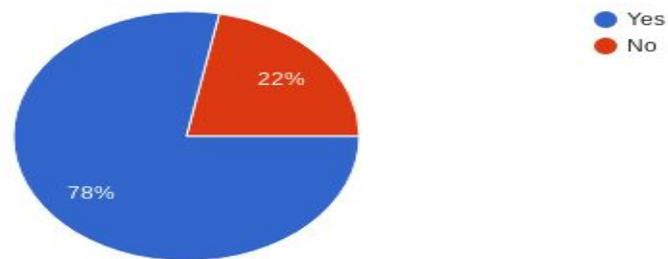- Yes
- No

100%
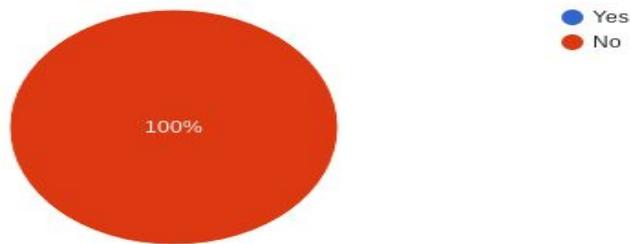
How many children do you have in your household?

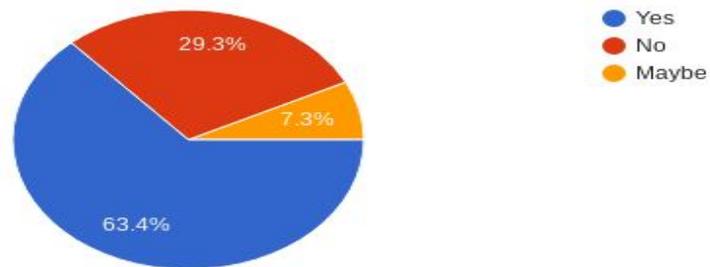41 responses

- 1
- 2
- 3
- 4 or more

39%
9.8%
9.8%
41.5%

Do you have children or know of children, that are struggling in school and would benefit from a technology enhanc...ored to their unique learning needs?
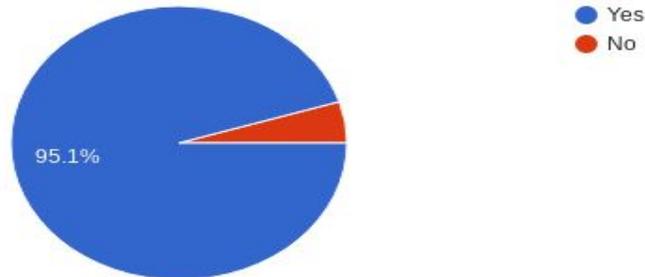
41 responses

- Yes
- No

22%
78%

Do you currently reside in West Charlotte & or will be moving there?

41 responses

- Yes
- No
- Maybe

29.3%
7.3%
63.4%

If you live anywhere in Mecklenburg county would you be more willing to enroll your child/children in this school if it provided transportation?
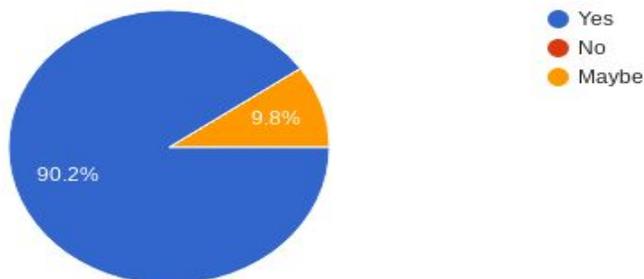
41 responses

Yes
No

95.1%

Would you prefer to have your child/children educated at one school for K-12?

41 responses

Yes
No

97.6%

Do you feel that school based mentoring and leadership development would benefit the majority of students...n Charlotte and or neighboring towns?

41 responses

Yes
No
Maybe

9.8%

90.2%

What are the components of a K-12 school that you feel would greatly benefits students in Charlotte and neighboring towns? 16 responses

Caring teachers with more support and time given for students to learn

remove all the extra testing

Reading and Math instruction

job shadowing

before and aftercare

unsure

na

I like the mentoring and leadership development

My child needs help with math; I'm not good with Math either.

n/a

quality instruction, textbooks and workbook

Stop teaching to the test

Is there anything specific to the education of students that you would like to share with us? If so, please share below. 16 responses

no (28)

After school program for working parents

We need more schools with small class sizes; our schools are overfilled.

pay teachers more to teach our kids better

my kids need transportation because car not working.

More support for our children

students need books and access to technology

students are stressed out do to all of this testing.

My son was failing Highschool and my daughter is in middle school and needs help with Math,poetry.

Thanks for asking for my input.

2. **Craigslist** Survey https://charlotte.craigslist.org/vol/6649664598.html

New K-12 Charter School needs your input (West Charlotte area) Hi everyone,There's a new K-12 charter school proposing to open in West Charlotte in the year 2020.The charter school administrators deeply appreciates your input to determine the need for this school.

3. Face-Face distribution: Surveys were handed out at Freedom Park, Charlotte, NC on Saturday, June 30th to families, couples & individuals.

_____

Results for the Craigslist, Meetup and Face - Face distribution of surveys are listed below:

1. Do you feel that the current school system is meeting the needs of all students,specifically students with learning difficulties?
Yes (28%)   No (72%)

2. How many children do you have?
1 child (29%)   2 children (48%)   3 or more children (23%)

3. Do you have children or know of children, that are struggling in school and would benefit from specialized instruction tailored to their learning needs?   `
Yes (82 %)   No (18%)

4. Do you currently reside in West Charlotte & or will be moving there?
Yes (63 %)   No (26%)   Moving (11%)

5. Would you be willing to enroll your child/children in the school if it did not provide transportation? **Yes (56%)   No (12%) N/A (32%)**

Evaluation:

After analyzing the survey data contained from the email distribution list, the face to face survey distribution,craigslist and meetup survey responses,there is a clear need for our specialized school within Charlotte North Carolina and neighboring counties. 100% of people surveyed believed that the local LEA is not meeting the needs of all

students,and that they would like for their children to attend a K-12 school that provides the specialized supports & transportation services that Achieving Excellence Academy of Charlotte offers.

A Story of Units:
A Curriculum Overview for Grades P-5

Table of Contents:

Introduction

This document provides an overview of the academic year for Pre-Kindergarten through Grade 5, beginning with a curriculum map and followed by detailed grade-level descriptions.

The curriculum map is a chart that shows, at a glance, the sequence of modules comprising each grade of the entire elementary curriculum. The map also indicates the approximate number of instructional days designated for each module of each grade. The date approximations are based on an academic calendar beginning on 9/6/12 and ending on 6/26/13 with a testing date approximately mid-late April. Details that elaborate on the curriculum map are found in the grade-level descriptions. Each grade-level description begins with a list of the five to seven modules that comprise the instruction of that grade. That introductory component is followed by three sections: the **Summary of Year**, the **Rationale for Module Sequence**, and the **Alignment Chart** with the grade-level standards. The **Summary of Year** portion of each grade level includes four pieces of information:

- The critical instructional areas for the grade, as described in the Common Core Learning Standards[1] (CCLS)
- The Key Areas of Focus[2] for the grade band (Note that this information is not available for Pre-Kindergarten.)
- The Required Fluencies[3] for the grade (Note that this information is not available for Pre-Kindergarten.)
- The CCLS Major Emphasis Clusters[4] for the grade (Note that this information is not available for Pre-Kindergarten.)

The **Rationale for Module Sequence** portion of each grade level provides a brief description of the instructional focus of each module for that grade and explains the developmental sequence of the mathematics.

The **Alignment Chart** for each grade lists the CCLS that are addressed in each module of the grade. Throughout the alignment charts, when a cluster is included without a footnote, it is taught in its entirety; there are also times when footnotes are relevant to particular standards within a cluster. All standards for each grade have been carefully included in the module sequence. Some standards are deliberately included in more than one module, so that a strong foundation can be built over time. Note that for Grade 3 through Grade 5, the standards identified on the Pre-Post Standards[5] document as those which should be taught after the state test in April, have been intentionally aligned with the final modules of those grades.

Test Date		Pre-Kindergarten	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	
9/6/12	20 days	M1: Numbers to 5 (45 days)	M1: Numbers to 10 (43 days)	M1: Sums and Differences to 10 (45 days)	M1: Sums and Differences to 20 (10 days)	M1: Properties of Multiplication and Division and Solving Problems with Units of 2-5 and 10 (25 days)	M1: Place Value, Rounding, and Algorithms for Addition and Subtraction (25 days)	M1: Place Value and Decimal Fractions (20 days)	20 days
10/10/12	20 days				M2: Addition and Subtraction of Length Units (12 days)		*M2: Unit Conversions (7 days)	M2: Multi-Digit Whole Number and Decimal Fraction Operations (35 days)	20 days
11/8/12	20 days	M2: Two-Dimensional and Three-Dimensional Shapes (15 days)	*M2: 2D and 3D Shapes (12 days)		M3: Place Value, Counting, and Comparison of Numbers to 1000 (25 days)	M2: Place Value and Problem Solving with Units of Measure (25 days)	M3: Multi-Digit Multiplication and Division (43 days)		20 days
12/11/12	20 days	M3: Counting to Answer Questions of How Many (50 days)	M3: Comparison of Length, Weight, Capacity, and Numbers to 10 (38 days)	M2: Introduction to Place Value Through Addition and Subtraction Within 20 (35 days)	M4: Addition and Subtraction Within 200 with Word Problems to 100 (35 days)	M3: Multiplication and Division with Units of 0, 1, 6-9, and Multiples of 10 (25 days)		M3: Addition and Subtraction of Fractions (22 days)	20 days
1/17/13	20 days			M3: Ordering and Comparing Length Measurements as Numbers (15 days)	M5: Addition and Subtraction Within 1000 with Word Problems to 100 (24 days)	M4: Multiplication and Area (20 days)	M4: Angle Measure and Plane Figures (20 days)	M4: Multiplication and Division of Fractions and Decimal Fractions (38 days)	20 days
2/15/13	20 days		M4: Number Pairs, Addition and Subtraction to 10 (47 days)	M4: Place Value, Comparison, Addition and Subtraction to 40 (35 days)	M6: Foundations of Multiplication and Division (24 days)	M5: Fractions as Numbers on the Number Line (35 days)	M5: Fraction Equivalence, Ordering, and Operations (45 days)		20 days
3/22/13	20 days	M4: Comparison of Length, Weight, and Capacity (35 days)						M5: Addition and Multiplication with Volume and Area (25 days)	20 days
4/29/13	20 days	M5: Numerals to 5, Addition and Subtraction Stories, Counting to 20 (35 days)	M5: Numbers 10-20 and Counting to 100 (30 days)	M5: Identifying, Composing, and Partitioning Shapes (15 days)	M7: Problem Solving with Length, Money, and Data (30 days)	M6: Collecting and Displaying Data (10 days)	M6: Decimal Fractions (20 days)	M6: Problem Solving with the Coordinate Plane (40 days)	20 days
5/28/13	20 days		M6: Analyzing, Comparing, and Composing Shapes (10 days)	M6: Place Value, Comparison, Addition and Subtraction to 100 (35 days)	M8: Time, Shapes, and Fractions as Equal Parts of Shapes (20 days)	M7: Geometry and Measurement Word Problems (40 days)	M7: Exploring Multiplication (20 days)		20 days

Key:	Geometry	Number	Number and Geometry, Measurement	Fractions

*Please refer to grade-level descriptions to identify partially labeled modules and the standards corresponding to all modules.

Sequence of Pre-Kindergarten Modules Aligned with the Standards

Module 1: Numbers to 5

Module 2: Two-Dimensional and Three-Dimensional Shapes

Module 3: Counting to Answer Questions of How Many

Module 4: Comparison of Length, Weight, and Capacity

Module 5: Numerals to 5, Addition and Subtraction Stories, Counting to 20

Summary of Year

Pre-Kindergarten mathematics is about (1) developing an understanding of whole numbers using concrete materials, including concepts of correspondence, counting, cardinality, and comparison; and (2) describing shapes in their environment. More learning time in Pre-Kindergarten should be devoted to developing the concept of number than to other topics.

Rationale for Module Sequence in Pre-Kindergarten

Students enter Pre-Kindergarten and find a well-planned, sequential math program awaiting, one that is embedded with hands-on, playful, interactive, largely concrete experiences. Students are encouraged to use their math words to communicate their observations.

The first step, done in Module 1, is to analyze, sort, classify, and count up to 5 with meaning. In Module 2, students practice their numbers up-to-five fluency as they encounter and engage with circles, rectangles, squares, and triangles in their environment. With numbers to 5 understood, work begins in Module 3 on extending "How Many" questions up to 10. The key here is to build from 5, using their fingers to support this perspective.

- 6 is 5 and 1
- 7 is 5 and 2
- 8 is 5 and 3, etc.

Thus, numbers 6–10 are 5 together with numbers 1–5, making the numbers to 10 familiar and manageable. In Module 4, students measure length, weight, and capacity, developing their word bank to include the language of comparison: "small, big, short and tall (length), heavy and light (weight),

empty and full (capacity), while continuing to practice fluency with numbers to 10. With numbers 1–10 still developing, counting to 20 begins while addition and subtraction are initiated within classroom stories and playful contexts in Module 5.

Alignment Chart

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Pre-Kindergarten Modules[6]

Module 1:
Numbers to 5[7]
(45 days)
	Know number names and the count sequence.
	
	PK.CC.1 Count to 20.
	
	PK.CC.2 Represent a number of objects with a written numeral 0–5 (with 0 representing a count of no objects).
	
	Count to tell the number of objects.[8]
	
	PK.CC.3 Understand the relationship between numbers and quantities to 10; connect counting to cardinality.
	
	   a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
	
	   b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
	
	   c. Understand that each successive number name refers to a quantity that is one larger.
	
	PK.CC.4 Count to answer "how many?" questions about as many as 10 things arranged in a line, a rectangular array, or a circle, or as many as 5 things in a scattered configuration; given a number from 1–10, count out that many objects.

[6] When a cluster is referred to in this chart without a footnote, the cluster is taught in its entirety.
[7] In this module, standards work is limited to within 5.
[8] Within 5.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Pre-Kindergarten Modules[6]
	Compare numbers.[9]
	PK.CC.5 Identify whether the number of objects in one group is more, less, greater than, fewer, and/or equal to the number of objects in another group, e.g., by using matching and counting strategies.
	Understand simple patterns.
	PK.OA.2 Duplicate and extend (e.g., What comes next?) simple patterns using concrete objects.
	Sort objects and count the number of objects in each category.[10]
	PK.MD.2 Sort objects into categories; count the numbers of objects in each category.
Module 2: **Two-Dimensional and Three-Dimensional Shapes** (15 days)	**Sort objects and count the number of objects in each category.**
	PK.MD.2 Sort objects into categories; count the numbers of objects in each category. (Limit category counts to be less than or equal to 10.)
	Identify and describe shapes (squares, circles, triangles, rectangles).
	PK.G.1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as top, bottom, up, down, in front of, behind, over, under, and next to.
	PK.G.2 Correctly name shapes regardless of size.
	Analyze, compare, and sort objects.
	PK.G.3 Analyze, compare, and sort two- and three-dimensional shapes and objects, in different sizes, using informal language to describe their similarities, differences, and other attributes (e.g., color, size, and shape).
	PK.G.4 Create and build shapes from components (e.g., sticks and clay balls).

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[9] The balance of this cluster is addressed in Modules 3 and 4.
[10] Within 5.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Pre-Kindergarten Modules[6]

Module 3:
 	
Counting to Answer Questions of How Many
 	
(50 days)
	Count to tell the number of objects.
	
	PK.CC.3 Understand the relationship between numbers and quantities to 10; connect counting to cardinality.
	
	    a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
	
	    b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
	
	    c. Understand that each successive number name refers to a quantity that is one larger.
	
	PK.CC.4 Count to answer "how many?" questions about as many as 10 things arranged in a line, a rectangular array, or a circle, or as many as 5 things in a scattered configuration; given a number from 1–10, count out that many objects.
	
	Compare numbers.[11]
	
	PK.CC.5 Identify whether the number of objects in one group is more, less, greater than, fewer, and/or equal to the number of objects in another group, e.g., by using matching and counting strategies.
	
	PK.CC.6 Identify "first" and "last" related to order or position.
	
	Sort objects and count the number of objects in each category.
	
	PK.MD.2 Sort objects into categories; count the numbers of objects in each category. (Limit category counts to be less than or equal to 10.)

Module 4: **Comparison of Length, Weight, and Capacity** (35 days)	**Compare numbers.** **PK.CC.5** Identify whether the number of objects in one group is more, less, greater than, fewer, and/or equal to the number of objects in another group, e.g., by using matching and counting strategies.

[11] PK. CC. 5 focuses here on "more," "less" and "equal to." "Than" is excluded and introduced in the context of measurement in Module 4.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Pre-Kindergarten Modules[6]
	PK.CC.6 Identify "first" and "last" related to order or position. **Describe and compare measurable attributes.** **PK.MD.1** Identify measurable attributes of objects, such as length, and weight. Describe them using correct vocabulary (e.g., small, big, short, tall, empty, full, heavy, and light).
Module 5: **Numerals to 5, Addition and Subtraction Stories, Counting to 20** (35 days)	**Know number names and the count sequence.** **PK.CC.1** Count to 20. **PK.CC.2** Represent a number of objects with a written numeral 0–5 (with 0 representing a count of no objects). **Understand addition as adding to, and understand subtraction as taking from.** **PK.OA.1** Demonstrate an understanding of addition and subtraction by using objects, fingers, and responding to practical situations (e.g., If we have 3 apples and add two more, how many apples do we have all together?). **Understand simple patterns.** **PK.OA.2** Duplicate and extend (e.g., What comes next?) simple patterns using concrete objects.

Sequence of Kindergarten Modules Aligned with the Standards

Module 1: Numbers to 10
Module 2: Two-Dimensional and Three-Dimensional Shapes
Module 3: Comparison of Length, Weight, Capacity, and Numbers to 10
Module 4: Number Pairs, Addition and Subtraction to 10
Module 5: Numbers 10–20 and Counting to 100
Module 6: Analyzing, Comparing, and Composing Shapes

Summary of Year

Kindergarten mathematics is about (1) representing, relating, and operating on whole numbers, initially with sets of objects; and (2) describing shapes and space. More learning time in Kindergarten should be devoted to number than to other topics.

Key Areas of Focus for K-2:   Addition and subtraction—concepts, skills, and problem solving

Required Fluency: K.OA.5   Add and subtract within 5.

CCLS Major Emphasis Clusters
Counting and Cardinality
• Know number names and count sequence.
• Count to tell the number of objects.
• Compare numbers.
Operations and Algebraic Thinking
• Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.
Number and Operations in Base Ten
• Work with numbers 11-19 to gain foundations for place value.

Rationale for Module Sequence in Kindergarten

Like Pre-Kindergarten, in Module 1, Kindergarten starts out with solidifying the meaning of numbers to 10 with a focus on embedded numbers and relationships to 5 using fingers, cubes, drawings, 5 groups and the Rekenrek. Students then investigate patterns of "1 more" and "1 less" using models such as the number stairs (see picture). Because fluency with addition and subtraction within 5 is a Kindergarten goal, addition within 5 is begun in Module 1 as another representation of the decomposition of numbers.

Number Stairs

In Module 2, Students learn to identify and describe squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders and spheres. During this module students also practice their fluency with numbers to 10.

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A Story of Units: A Curriculum Overview for Grades P-5
Date: 7/7/13

In Module 3, students begin to experiment with comparison of length, weight and capacity. Students first learn to identify the attribute being compared, moving away from non-specific language such as "bigger" to "longer than," "heavier than," or "more than." Comparison begins with developing the meaning of the word "than" in the context of "taller than," "shorter than," "heavier than," "longer than," etc. The terms "more" and "less" become increasingly abstract later in Kindergarten. "7 is 2 more than 5" is more abstract than "Jim is taller than John."

In Module 4, number comparison leads to a further study of embedded numbers (e.g., "3 is less than 7" leads to, "3 and 4 make 7," and 3 + 4 = 7,). "1 more, 2 more, 3 more" lead into addition (+1, +2, +3). Students now represent stories with blocks, drawings, and equations.

After Module 5, after students have a meaningful experience of addition and subtraction within 10 in Module 4, they progress to exploration of numbers 10-20. They apply their skill with and understanding of numbers within 10 to teen numbers, which are decomposed as "10 ones and some ones." For example, "12 is 2 more than 10." The number 10 is special; it is the anchor that will eventually become the "ten" unit in the place value system in Grade 1.

Module 6 rounds out the year with an exploration of shapes. Students build shapes from components, analyze and compare them, and discover that they can be composed of smaller shapes, just as larger numbers are composed of smaller numbers.

Alignment Chart

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Kindergarten Modules[12]

Module 1:
Numbers to 10[13]
 	
(43 days)
	Know number names and the count sequence.[14]
	
	K.CC.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).
	
	Count to tell the number of objects.[15]
	
	K.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.
	
	     a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
	
	     b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
	
	     c. Understand that each successive number name refers to a quantity that is one larger.
	
	K.CC.5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.
	
	Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.[16]
	
	K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).

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[12] When a cluster is referred to in this chart without a footnote, the cluster is taught in its entirety.

[13] In this module, standards work is limited to within 10.

[14] The balance of this cluster is addressed in Module 5.

[15] K.CC.4d is addressed in Module 6.

[16] The balance of this cluster is addressed in Module 4.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Kindergarten Modules[12]
	Classify objects and count the number of objects in each category. **K.MD.3** Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. (Limit category counts to be less than or equal to 10.)
Module 2: **Two-Dimensional and Three-Dimensional Shapes** (12 days)	**Classify objects and count the number of objects in each category.** **K.MD.3** Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. (Limit category counts to be less than or equal to 10.) **Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).** **K.G.1** Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above*, *below*, *beside*, *in front of*, *behind*, and *next to*. **K.G.2** Correctly name shapes regardless of their orientations or overall size. **K.G.3** Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid"). **Analyze, compare, create, and compose shapes.[17]** **K.G.4** Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).
Module 3: **Comparison of Length, Weight, Capacity, and Numbers to 10** (38 days)	**Compare numbers.** **K.CC.6** Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies. (Include groups with up to ten objects.) **K.CC.7** Compare two numbers between 1 and 10 presented as written numerals. Describe and compare measurable attributes.

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[17] The balance of this cluster is addressed in Module 6.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Kindergarten Modules[12]
	K.MD.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
	K.MD.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. *For example, directly compare the heights of two children and describe one child as taller/shorter.*
Module 4: **Number Pairs, Addition and Subtraction to 10** (47 days)	**Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.** **K.OA.1** Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. (Drawings need not show details, but should show the mathematics in the problem.) **K.OA.2** Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem. **K.OA.3** Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1). **K.OA.4** For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings and record the answer with a drawing or equation. **K.OA.5** Fluently add and subtract within 5.
Module 5: **Numbers 10–20 and Counting to 100** (30 days)	**Know number names and the count sequence.** **K.CC.1** Count to 100 by ones and by tens. **K.CC.2** Count forward beginning from a given number within the known sequence (instead of having to begin at 1). **K.CC.3** Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Kindergarten Modules[12]
	Count to tell the number of objects.[18]
	K.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.
	a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
	b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
	c. Understand that each successive number name refers to a quantity that is one larger.
	K.CC.5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.
	Work with numbers 11-19 to gain foundations for place value.
	K.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings and record each composition or decomposition by a drawing or equation (such as 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two three, four, five, six, seven, eight or nine ones.
Module 6: **Analyzing, Comparing, and Composing Shapes** (10 days)	**Count to tell the number of things.**[19]
	K.CC.4 Understand the relationship between numbers and quantities: connect counting to cardinality.
	d. Develop understanding of ordinal numbers (first through tenth) to describe the relative position and magnitude of whole numbers.
	Analyze, compare, create and compose shapes.
	K.G.4 Analyze and compare two and three dimensional shapes, in different sizes and orientations,

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[18] K.CC.4d is addressed in Module 6.

[19] Ordinality is introduced in the context of constructing and manipulating shapes. The balance of this cluster is addressed in Modules 1 and 5.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Kindergarten Modules[12]
	using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).
	K.G.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.
	K.G.6 Compose simple shapes to form larger shapes. *For example, "Can you join these two triangles with full sides touching to make a rectangle?*

Sequence of Grade 1 Modules Aligned with the Standards

Module 1: Sums and Differences to 10

Module 2: Introduction to Place Value Through Addition and Subtraction Within 20

Module 3: Ordering and Comparing Length Measurements as Numbers

Module 4: Place Value, Comparison, Addition and Subtraction to 40

Module 5: Identifying, Composing, and Partitioning Shapes

Module 6: Place Value, Comparison, Addition and Subtraction to 100

Summary of Year

First Grade mathematics is about (1) developing understanding of addition, subtraction, and strategies for addion and subtraction within 20; (2) developing understanding of whole number relationships and place value, including grouping in tens and ones; (3) developing understanding of linear measurement and measuring lengths as iterating length units; and (4) reasoning about attributes of, and composing and decomposing geometric shapes.

Key Areas of Focus for K-2:   Addition and subtraction—concepts, skills, and problem solving

Required Fluency: 1.OA.6   Add and subtract within 10.

| CCLS Major Emphasis Clusters |
|---|
| Operations and Algebraic Thinking |
| • Represent and solve problems involving addition and subtraction. |
| • Understand and apply properties of operations and the relationship between addition and subtraction. |
| • Add and subtract within 20. |
| • Work with addition and subtraction equations. |
| Number and Operations in Base Ten |
| • Extend the counting sequence. |
| • Understand place value. |
| • Use place value understanding and properties of operations to add and subtract. |
| Measurement and Data |
| • Measure lengths indirectly and by iterating length units. |

Rationale for Module Sequence in Grade 1

In Grade 1, work with numbers to 10 continues to be a major stepping-stone in learning the place value system. In Module 1, students work to further understand the meaning of addition and subtraction begun in Kindergarten, largely within the context of the Grade 1 word problem types. They begin intentionally and energetically building fluency with addition and subtraction facts—a major gateway to later grades.

In Module 2, students add and subtract within 20. Work begins by modeling "adding and subtracting across ten" in word problems and with equations. Solutions involving decomposition and composition like that shown to the right for 8 + 5 reinforce the need to "make 10." In Module 1, students loosely grouped 10 objects to make a ten. They now transition to conceptualizing that ten as a single unit (using 10 linking cubes stuck together, for example). This is the next major stepping-stone in understanding place value, learning to group "10 ones" as a single unit: 1 ten. Learning to "complete a unit" empowers students in later grades to understand "renaming" in the addition algorithm, to add 298 and 35 mentally (i.e., 298 + 2 + 33), and to add measurements like 4 m, 80 cm, and 50 cm (i.e., 4 m + 80 cm + 20 cm + 30 cm = 4 m + 1 m + 30 cm = 5 m 30 cm).
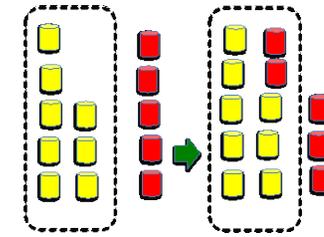
$$8 + 5 = 8 + (2 + 3) = (8 + 2) + 3 = 10 + 3 = 13$$

Adding Across a Ten

Module 3, which focuses on measuring and comparing lengths indirectly and by iterating length units, gives students a few weeks to practice and internalize "making a 10" during daily fluency activities.

Module 4 returns to understanding place value. Addition and subtraction within 40 rest on firmly establishing a "ten" as a unit that can be counted, first introduced at the close of Module 2. Students begin to see a problem like 23 + 6 as an opportunity separate the "2 tens" in 23 and concentrate on the familiar addition problem 3 + 6. Adding 8 + 5 is related to solving 28 + 5; complete a unit of ten and add 3 more.

In Module 5, students think about attributes of shapes and practice composing and decomposing geometric shapes. They also practice work with addition and subtraction within 40 during daily fluency activities (from Module 4). Thus, this module provides important "internalization time" for students between two intense number-based modules. The module placement also gives more spatially-oriented students the opportunity to build their confidence before they return to arithmetic.

Although Module 6 focuses on "adding and subtracting within 100," the learning goal differs from the "within 40" module. Here, the new level of complexity is to build off the place value understanding and mental math strategies that were introduced in earlier modules. Students explore by using simple examples and the familiar units of 10 made out of linking cubes, bundles, and drawings. Students also count to 120 and represent any number within that range with a numeral.

EUREKA MATH™

A Story of Units: A Curriculum Overview for Grades P-5
Date: 7/7/13

Alignment Chart

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 1 Modules[20]
Module 1: **Sums and Differences to 10** [21] (45 days)	**Represent and solve problems involving addition and subtraction.**[22] **1.OA.1** Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart and comparing, with unknowns in all positions, e.g., by using objects, drawings and equations with a symbol for the unknown number to represent the problem. (See Glossary, Table 1.) **Understand and apply properties of operations and the relationship between addition and subtraction.** **1.OA.3** Apply properties of operations as strategies to add and subtract. (Students need not use formal terms for these properties.) *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)* **1.OA.4** Understand subtraction as an unknown-addend problem. *For example, subtract 10 − 8 by finding the number that makes 10 when added to 8.* **Add and subtract within 20.** **1.OA.5** Relate counting to addition and subtraction (e.g., by counting on 2 to add 2). **1.OA.6** Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 − 4 = 13 − 3 − 1 = 10 − 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 − 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13). **Work with addition and subtraction equations.**

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[20] When a cluster is referred to in this chart without a footnote, the cluster is taught in its entirety.
[21] In this module, work is limited to within 10.
[22] 1.OA.2 is addressed in Module 2.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 1 Modules[20]
	1.OA.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. *For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.*
	1.OA.8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = ? - 3, 6 + 6 = ?.*
Module 2: **Introduction to Place Value Through Addition and Subtraction Within 20** (35 days)	**Represent and solve problems involving addition and subtraction.** **1.OA.1** Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. (See Glossary, Table 1.) **1.OA.2** Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. **Understand and apply properties of operations and the relationship between addition and subtraction.** **1.OA.3** Apply properties of operations as strategies to add and subtract. (Students need not use formal terms for these properties.) *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)* **1.OA.4** Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.* **Add and subtract within 20.[27]** **1.OA.6** Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a

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[27] The balance of this cluster is addressed in Module 1.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 1 Modules[20]
	number leading to a ten (e.g., 13 − 4 = 13 − 3 − 1 = 10 − 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 − 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13). **Understand place value.[28]** **1.NBT.2** Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: a. 10 can be thought of as a bundle of ten ones – called a "ten." b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.
Module 3: **Ordering and Comparing Length Measurements as Numbers** (15 days)	**Represent and solve problems involving addition and subtraction.[29]** **1.OA.1** Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. (See Glossary, Table 1.) **Measure lengths indirectly and by iterating length units.** **1.MD.1** Order three objects by length; compare the lengths of two objects indirectly by using a third object. **1.MD.2** Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.*

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[28] Focus in this module is on numbers to 20. The balance of this cluster is addressed in Modules 4 and 6.
[29] The balance of this cluster is addressed in Module 2.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 1 Modules[20]
	Represent and interpret data.
	1.MD.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.
Module 4: **Place Value, Comparison, Addition and Subtraction to 40** (35 days)	**Represent and solve problems involving addition and subtraction.[30]**
	1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. (See Glossary, Table 1.)
	Extend the counting sequence.[31]
	1.NBT.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
	Understand place value.[32]
	1.NBT.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:
	a. 10 can be thought of as a bundle of ten ones – called a "ten."
	c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).
	1.NBT.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.
	Use place value understanding and properties of operations to add and subtract.[33]

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[30] The balance of this cluster is addressed in Module 2.
[31] Focus on numbers to 40.
[32] Focus on numbers to 40.
[33] Focus on numbers to 40.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 1 Modules[20]
	1.NBT.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.
	1.NBT.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
	1.NBT.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
Module 5: **Identifying, Composing, and Partitioning Shapes** (15 days)	**Tell and write time and money.**[34] **1.MD.3** Tell and write time in hours and half-hours using analog and digital clocks. Recognize and identify coins, their names, and their value. **Reason with shapes and their attributes.** **1.G.1** Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes. **1.G.2** Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. (Students do not need to learn formal names such as "right rectangular prism.) **1.G.3** Partition circles and rectangles into two and four equal shares, describe the shares using the

[34] Focus on time. Coins are addressed in Module 6.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 1 Modules[20]
	words *halves, fourths*, and *quarters*, and use the phrases *half of, fourth of*, and *quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.
Module 6: **Place Value, Comparison, Addition and Subtraction to 100** (35 days)	**Extend the counting sequence.** **1.NBT.1** Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral. **Understand place value.** **1.NBT.2** Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: a. 10 can be thought of as a bundle of ten ones – called a "ten." c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones). **1.NBT.3** Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <. **Use place value understanding and properties of operations to add and subtract.** **1.NBT.4** Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten. **1.NBT.5** Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count: explain the reasoning used. **1.NBT.6** Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value,

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 1 Modules[20]
	properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. **Tell and write time and money.**[35] **1.MD.3** Tell and write time in hours and half-hours using analog and digital clocks. Recognize and identify coins, their names, and their value.

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[35] Focus on money.

Sequence of Grade 2 Modules Aligned with the Standards

Module 1: Sums and Differences to 20

Module 2: Addition and Subtraction of Length Units

Module 3: Place Value, Counting, and Comparison of Numbers to 1000

Module 4: Addition and Subtraction Within 200 with Word Problems to 100

Module 5: Addition and Subtraction Within 1000 with Word Problems to 100

Module 6: Foundations of Multiplication and Division

Module 7: Problem Solving with Length, Money, and Data

Module 8: Time, Shapes, and Fractions as Equal Parts of Shapes

Summary of Year

Second Grade mathematics is about (1) extending understanding of base-ten notation; (2) building fluency with addition and subtraction; (3) using standard units of measure; and (4) describing and analyzing shapes.

Key Areas of Focus for K-2:   Addition and subtraction—concepts, skills, and problem solving

Required Fluency: 2.OA.2   Add and subtract within 20.
2.NBT.5   Add and subtract within 100.

| CCLS Major Emphasis Clusters |
|---|
| Operations and Algebraic Thinking |
| • Represent and solve problems involving addition and subtraction. |
| • Add and subtract within 20. |
| • Work with equal groups of objects to gain foundations for multiplication. |
| Number and Operations in Base Ten |
| • Understand place value. |
| • Use place value understanding and properties of operations to add and subtract. |
| Measurement and Data |
| • Measure and estimate lengths in standard units. |
| • Relate addition and subtraction to length. |

Rationale for Module Sequence in Grade 2

From Grade 1, students have fluency of addition and subtraction within 10 and extensive experience working with numbers to 100. Module 1 of Grade 2 establishes a motivating, differentiated fluency program in the first few weeks that will provide each student with enough practice to achieve mastery of the new required fluencies (i.e., adding and subtracting within 20 and within 100) by the end of the year. Students learn to represent and solve word problems using addition and subtraction: a practice that will also continue throughout the year.

In Module 2, students learn to measure and estimate using standard units for length and solve measurement word problems involving addition and subtraction of length. A major objective is for students to use measurement tools with the understanding that linear measure involves an iteration of units and that the smaller a unit, the more iterations are necessary to cover a given length. Students work exclusively with metric units, i.e. centimeters and meters, in this module to support upcoming work with place value concepts in Module 3. Units also play a central role in the addition and subtraction algorithms of Modules 4 and 5. An underlying goal for this module is for students to learn the meaning of a "unit" in a different context, that of length. This understanding serves as the foundation of arithmetic, measurement, and geometry in elementary school.

All arithmetic algorithms are manipulations of place value units: ones, tens, hundreds, etc. In Module 3, students extend their understanding of base-ten notation and apply their understanding of place value to count and compare numbers to 1000. In Grade 2 the place value units move from a proportional model to a non-proportional number disk model (see picture). The place value table with number disks can be used through Grade 5 for modeling very large numbers and decimals, thus providing students greater facility with and understanding of mental math and algorithms.
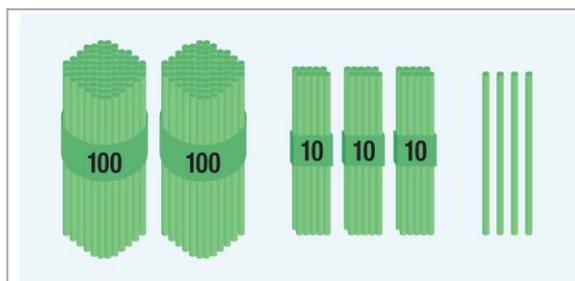
Proportional Model for Place Value
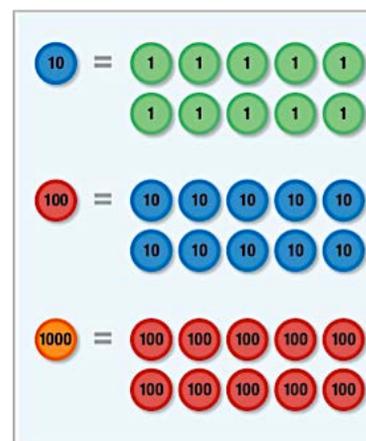
Non-Proportional Model for Place Value

In Module 4, students apply their work with place value units to add and subtract within 200 moving from concrete to pictorial to abstract. This work deepens their understanding of base-ten, place value, and the properties of operations. It also challenges them to apply their knowledge to one-step and two-step word problems. During this module, students also continue to develop one of the required fluencies of the grade: addition and subtraction within 100.

Module 5 builds upon the work of Module 4. Students again use place value strategies, manipulatives, and math drawings to extend their conceptual understanding of the addition and subtraction algorithms to numbers within 1000. They maintain addition and subtraction fluency within 100

through daily application work to solve one- and two-step word problems of all types. A key component of Modules 4 and 5 is that students use place value reasoning to explain why their addition and subtraction strategies work.

In Module 6, students extend their understanding of a unit to build the foundation for multiplication and division wherein any number, not just powers of ten, can be a unit. Making equal groups of "four apples each" establishes the unit "four apples" (or just four) that can then be counted: 1 four, 2 fours, 3 fours, etc. Relating the new unit to the one used to create it lays the foundation for multiplication: 3 groups of 4 apples equal 12 apples (or 3 fours is 12).

Module 7 provides another opportunity for students to practice their algorithms and problem-solving skills with perhaps the most well-known, interesting units of all: dollars, dimes, and pennies. Measuring and estimating length is revisited in this module in the context of units from both the customary system (e.g., inches and feet) and the metric system (e.g., centimeters and meters). As they study money and length, students represent data given by measurement and money data using picture graphs, bar graphs, and line plots.

Students finish Grade 2 by describing and analyzing shapes in terms of their sides and angles. In Module 8, students investigate, describe, and reason about the composition and decomposition of shapes to form other shapes. Through building, drawing, and analyzing two- and three-dimensional shapes, students develop a foundation for understanding area, volume, congruence, similarity, and symmetry in later grades.

Alignment Chart

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 2 Modules[36]
Module 1: **Sums and Differences to 20** (10 days)	**Represent and solve problems involving addition and subtraction.[37]** **2.OA.1** Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. (See Glossary, Table 1.) **Add and subtract within 20.[38]** **2.OA.2** Fluently add and subtract within 20 using mental strategies. (See standard 1.OA.6 for a list of mental strategies.) By end of grade 2, know from memory all sums of two one-digit numbers. **Use place value understanding and properties of operations to add and subtract.[39]** **2.NBT.5** Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
Module 2: **Addition and Subtraction of Length Units** (12 days)	**Measure and estimate lengths in standard units.[40]** **2.MD.1** Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes. **2.MD.2** Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen. **2.MD.3** Estimate lengths using units of inches, feet, centimeters, and meters. **2.MD.4** Measure to determine how much longer one object is than another, expressing the length

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[36] When a cluster is referred to in this chart without a footnote, the cluster is taught in its entirety.

[37] In this module, word problems focus primarily on result unknown and change unknown situations.

[38] From this point forward, fluency practice with addition and subtraction to 20 is part of the students' ongoing experience.

[39] The balance of this cluster is addressed in Modules 4 and 5.

[40] Focus is on metric measurement in preparation for place value in Module 3. Customary measurement is addressed in Module 7.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 2 Modules[36]
	difference in terms of a standard length unit.
	Relate addition and subtraction to length.
	2.MD.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.
	2.MD.6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, …, and represent whole-number sums and differences within 100 on a number line diagram.

Module 3:
 	
 Place Value, Counting, and Comparison of Numbers to 1000
 	
 (25 days)
	Understand place value.
	
	 2.NBT.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
	
	    a. 100 can be thought of as a bundle of ten tens – called a "hundred."
	
	    b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
	
	 2.NBT.2 Count within 1000; skip-count by 5s[42], 10s, and 100s.
	
	 2.NBT.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
	
	 2.NBT.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.

Module 4: **Addition and Subtraction Within 200 with Word Problems to 100**	**Represent and solve problems involving addition and subtraction.** **2.OA.1** Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with

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[42] Use analog clock to provide a context for skip-counting by 5s.

EUREKA MATH™

A Story of Units: A Curriculum Overview for Grades P-5
Date: 7/7/13

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 2 Modules[36]
(35 days)	unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. (See Glossary, Table 1.) **Use place value understanding and properties of operations to add and subtract.[44]** **2.NBT.5** Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. **2.NBT.6** Add up to four two-digit numbers using strategies based on place value and properties of operations. **2.NBT.7** Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds. **2.NBT.8** Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900. **2.NBT.9** Explain why addition and subtraction strategies work, using place value and the properties of operations. (Explanations may be supported by drawings or objects.)
Module 5: **Addition and Subtraction Within 1000 with Word Problems to 100** (24 days)	**Use place value understanding and properties of operations to add and subtract.[45]** **2.NBT.7** Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds. **2.NBT.8** Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given

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[44] In this module, work is limited to within 200. This work is extended to numbers within 1000 in the next module.

[45] The balance of this cluster is addressed in Module 4.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 2 Modules[36]
	number 100-900.
	2.NBT.9 Explain why addition and subtraction strategies work, using place value and the properties of operations. (Explanations may be supported by drawings or objects.)
Module 6: **Foundations of Multiplication and Division** (24 days)	**Work with equal groups of objects to gain foundations for multiplication.**
	2.OA.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s: write an equation to express an even number as a sum of two equal addends.
	2.OA.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.
	Reason with shapes and their attributes.[47]
	2.G.2 Partition a rectangle into rows and columns of same size squares and count to find the total number of them.
Module 7: **Problem Solving with Length, Money, and Data** (30 days)	**Measure and estimate lengths in standard units.**
	2.MD.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
	2.MD.2 Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.
	2.MD.3 Estimate lengths using units of inches, feet, centimeters, and meters.
	2.MD.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
	Relate addition and subtraction to length.
	2.MD.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given

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[47] 2.G.2 is taught before G.1 and G.3 because the array model is so important to the foundation for multiplication.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 2 Modules[36]
	in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problems.
	2.MD.6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, …, and represent whole-number sums and differences within 100 on a number line diagram.
	Work with time and money.[49]
	2.MD.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. *Example: If you have 2 dimes and 3 pennies, how many cents do you have?*
	Represent and interpret data.
	2.MD.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.
	2.MD.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems (See Glossary, Table 1.) using information presented in a bar graph.
Module 8: **Time, Shapes, and Fractions as Equal Parts of Shapes** (20 days)	**Work with time and money.[50]**
	2.MD.7 Tell time and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
	Reason with shapes and their attributes.
	2.G.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. (Sizes are compared directly or visually, not compared by measuring.) Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

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[49] Focus on money. Time is addressed in Module 8.
[50] Focus on time. Money is addressed in Module 7.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 2 Modules[36]
	2.G.3 Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words *halves*, *thirds*, *half of*, *a third of*, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.

Sequence of Grade 3 Modules Aligned with the Standards

Module 1: Properties of Multiplication and Division and Solving Problems with Units of 2–5 and 10

Module 2: Place Value and Problem Solving with Units of Measure

Module 3: Multiplication and Division with Units of 0, 1, 6–9, and Multiples of 10

Module 4: Multiplication and Area

Module 5: Fractions as Numbers on the Number Line

Module 6: Collecting and Displaying Data

Module 7: Geometry and Measurement Word Problems

Summary of Year

Third Grade mathematics is about (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes.

Key Areas of Focus for 3-5:	Multiplication and division of whole numbers and fractions—concepts, skills, and problem solving
Required Fluency:	3.OA.7 Multiply and divide within 100.
	3.NBT.2 Add and subtract within 1000.

| CCLS Major Emphasis Clusters |
|---|
| Operations and Algebraic Thinking |
| • Represent and solve problems involving multiplication and division. |
| • Understand the properties of multiplication and the relationship between multiplication and division. |
| • Multiply and divide within 100. |
| • Solve problems involving the four operations and identify and explain patterns in arithmetic. |
| Number and Operations – Fractions |
| • Develop understanding of fractions as numbers. |
| Measurement and Data |
| • Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. |
| • Geometric measurement: understand concepts of area and relate area to multiplication and to addition. |

Rationale for Module Sequence in Grade 3

The first module builds upon the foundation of multiplicative thinking with units started in Grade 2. First, students concentrate on the meaning of multiplication and division and begin developing fluency for learning products involving factors of 2, 3, 4, 5, and 10 (see key areas of focus and

required fluency above). The restricted set of facts keeps learning manageable, and also provides enough examples to do one- and two-step word problems and to start measurement problems involving weight, capacity and time in the second module.

Module 2 focuses on measurement of time and metric weight and capacity. In exploratory lessons, students decompose a kilogram into 100 gram, 10 gram and 1 gram weights and decompose a liter into analogous amounts of milliliters. Metric measurement thereby develops the concept of mixed units, e.g. 3 kilograms 400 grams is clearly related to 3 thousands, 4 hundreds. Students then apply their new understanding of number to place value, comparison and rounding, composing larger units when adding, decomposing into smaller units when subtracting.   Students also draw proportional tape diagrams to solve word problems (e.g., "If this tape represents 62 kg, then a tape representing 35 kg needs to be slightly longer than half the 62 kg bar…"). Drawing the relative sizes of the lengths involved in the model prepares students to locate fractions on a number line in Module 5 (where they learn to locate points on the number line relative to each other and relative to the whole unit). Module 2 also provides students with internalization time for learning the 2, 3, 4, 5, and 10 facts as part of their fluency activities.

Students learn the remaining multiplication and division facts in Module 3 as they continue to develop their understanding of multiplication and division strategies within 100 and use those strategies to solve two-step word problems. The "2, 3, 4, 5 and 10 facts" module (Module 1) and the "0, 1, 6, 7, 8, 9 and multiples of 10 facts" module (Module 3) both provide important, sustained time for work in understanding the structure of rectangular arrays to prepare students for area in Module 4. This work is necessary because students initially find it difficult to distinguish the different units in a grid (the third array in the picture below), count them and recognize that the count is related to multiplication. Tiling also supports a correct interpretation of the grid. Modules 1 and 3 slowly build up to the area model (the fourth model in the picture below) using rectangular arrays in the context of learning multiplication and division:

Module 1 and Module 3   Module 4

Progression from Rectangular Array to Area Model
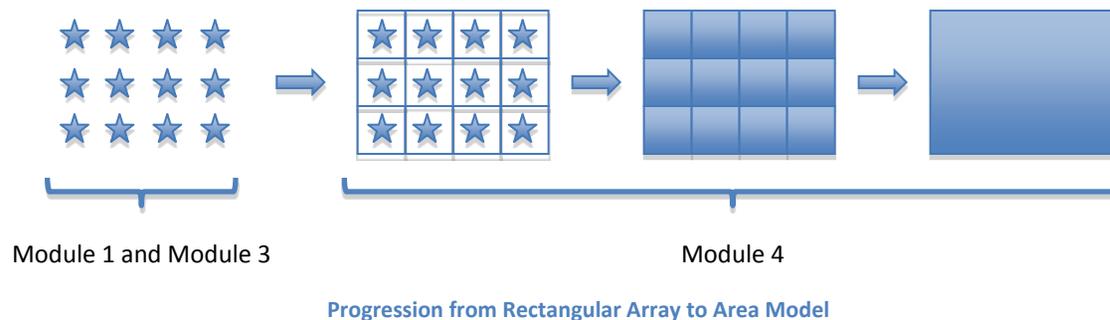
By Module 4, students are ready to investigate area. They measure the area of a shape by finding the total number of same-size units of area, e.g. tiles, required to cover the shape without gaps or overlaps. When that shape is a rectangle with whole number side lengths, it is easy to partition the rectangle into squares with equal areas (as in the third stage of the illustration above).

One goal of Module 5 is for students to transition from thinking of fractions as area or parts of a figure to points on a number line. To make that jump, students think of fractions as being constructed out of unit fractions: "1 fourth" is the length of a segment on the number line such that the length of four concatenated fourth segments on the line equals 1 (the whole). Once the unit "1 fourth" has been established, counting them is as easy as counting whole numbers: 1 fourth, 2 fourths, 3 fourths, 4 fourths, 5 fourths, etc. Students also compare fractions, find equivalent fractions in special cases, and solve problems that involve fractions.

In Module 6, students leave the world of exact measurements behind. By applying their knowledge of fractions from Module 5, they estimate lengths to the nearest halves and fourths of an inch and record that information in bar graphs and line plots. This module also prepares students for the multiplicative comparison problems of Grade 4 by asking students "how many more" and "how many less" questions about scaled bar graphs.

The year rounds out with plenty of time to solve two-step word problems involving the four operations, and to improve fluency for concepts and skills initiated earlier in the year. In Module 7, students also describe, analyze, and compare properties of two-dimensional shapes. By now, students have done enough work with both linear and area measurement models to understand that there is no relationship in general between the area of a figure and perimeter, which is one of the concepts taught in the last module.

Alignment Chart

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 3 Modules[52]
Module 1: **Properties of Multiplication and Division and Solving Problems with Units of 2–5 and 10** (25 days)	**Represent and solve problems involving multiplication and division.[53]** **3.OA.1** Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 x 7.* **3.OA.2** Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of

[52] When a cluster is referred to in this chart without a footnote, the cluster is taught in its entirety.
[53] In this module, work is limited to factors of 2–5 and 10 and the corresponding dividends.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 3 Modules[52]
	objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.* **3.OA.3** Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. (See Glossary, Table 2.) **3.OA.4** Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 x ? = 48, 5 = _ ÷ 3, 6 x 6 = ?* **Understand properties of multiplication and the relationship between multiplication and division.**[54] **3.OA.5** Apply properties of operations as strategies to multiply and divide. (Students need not use formal terms for these properties.) *Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)*[55] **3.OA.6** Understand division as an unknown-factor problem. *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.* **Multiply and divide within 100.**[56] **3.OA.7** Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. **Solve problems involving the four operations, and identify and explain patterns in arithmetic.**[57]

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[54] In this module, work is limited to factors of 2–5 and 10 and the corresponding dividends.

[55] The Associative property is addressed in Module 3.

[56] In this module, work is limited to factors of 2–5 and 10 and the corresponding dividends.

[57] In this module, problem solving is limited to multiplication and division, and limited to factors of 2–5 and 10 and the corresponding dividends. 3.OA.9 is addressed in Module 3.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 3 Modules[52]
	3.OA.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order, i.e., Order of Operations.)
Module 2: **Place Value and Problem Solving with Units of Measure** (25 days)	**Use place value understanding and properties of operations to perform multi-digit arithmetic. (A range of algorithms may be used.)[58]** **3.NBT.1** Use place value understanding to round whole numbers to the nearest 10 or 100. **3.NBT.2** Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. **Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.** **3.MD.1** Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram. **3.MD.2** Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). (Excludes compound units such as cm^3 and finding the geometric volume of a container.) Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (Excludes multiplicative comparison problems, i.e., problems involving notions of "times as much"; see Glossary, Table 2.)

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[58] 3.NBT.3 is taught in Module 3.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 3 Modules[52]
Module 3: **Multiplication and Division with Units of 0, 1, 6–9, and Multiples of 10** (25 days)	**Represent and solve problems involving multiplication and division.[59]** **3.OA.3** Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. (See Glossary, Table 2.) **3.OA.4** Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 x ? = 48, 5 =___ ÷ 3, 6 x 6 = ?* **Understand properties of multiplication and the relationship between multiplication and division.** **3.OA.5** Apply properties of operations as strategies to multiply and divide. (Students need not use formal terms for these properties.) *Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)* **Multiply and divide within 100.[60]** **3.OA.7** Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. **Solve problems involving the four operations, and identify and explain patterns in arithmetic.[61]** **3.OA.8** Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no

[59] The balance of this cluster is addressed in Module 1.

[60] From this point forward, fluency practice with multiplication and division facts is part of the students' on-going experience.

[61] After being fully taught in Module 3, this standard (as well as 3.OA.3) continues being practiced throughout the remainder of the school year.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 3 Modules[52]
	parentheses to specify a particular order, i.e., Order of Operations.)
	3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*
	Use place value understanding and properties of operations to perform multi-digit arithmetic. (A range of algorithms may be used.)[62]
	3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.

Module 4:
 	
 Multiplication and Area
 	
 (20 days)
	Geometric measurement: understand concepts of area and relate area to multiplication and to addition.
	
	 3.MD.5 Recognize area as an attribute of plane figures and understand concepts of area measurement.
	
	    a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.
	
	    b. A plane figure which can be covered without gaps or overlaps by *n* unit squares is said to have an area of *n* square units.
	
	 3.MD.6 Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).
	
	 3.MD.7 Relate area to the operations of multiplication and addition.
	
	    a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
	
	    b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
	
	    c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side

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[62] The balance of this cluster is addressed in Module 2.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 3 Modules[52]
	lengths *a* and *b* + *c* is the sum of *a* × *b* and *a* × *c*. Use area models to represent the distributive property in mathematical reasoning.
	d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.
Module 5: **Fractions as Numbers on the Number Line** (35 days)	**Develop understanding of fractions as numbers. (Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.)**
	3.NF.1 Understand a fraction 1/*b* as the quantity formed by 1 part when a whole is partitioned into *b* equal parts; understand a fraction *a/b* as the quantity formed by *a* parts of size 1/*b*.
	3.NF.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram.
	a. Represent a fraction 1/*b* on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size 1/*b* and that the endpoint of the part based at 0 locates the number 1/*b* on the number line.
	b. Represent a fraction *a/b* on a number line diagram by marking off *a* lengths 1/*b* from 0. Recognize that the resulting interval has size *a/b* and that its endpoint locates the number *a/b* on the number line.
	3.NF.3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.
	a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
	b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., by using a visual fraction model.
	c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at*

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 3 Modules[52]
	the same point of a number line diagram. d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model. **Reason with shapes and their attributes.[63]** **3.G.2** Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area and describe the area of each part as ¼ of the area of the shape.
Module 6: **Collecting and Displaying Data** (10 days)	**Represent and interpret data.** **3.MD.3** Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two- step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.* **3.MD.4** Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units – whole numbers, halves, or quarters.
Module 7: **Geometry and Measurement Word Problems[64]** (40 days)	**Represent and interpret data.[65]** **3.MD.4** Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units – whole numbers, halves, or quarters. **Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear**

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[63] 3.G.1 is taught in Module 7.

[64] The seemingly eclectic set of standards in Module 7 allows for a new level of word problems, including perimeter and measurement word problems.

[65] 3.MD.3 is taught in Module 6.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 3 Modules[52]
	and area measures.
	3.MD.8 Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.
	Reason with shapes and their attributes.
	3.G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Sequence of Grade 4 Modules Aligned with the Standards

Module 1: Place Value, Rounding, and Algorithms for Addition and Subtraction

Module 2: Unit Conversions and Problem Solving with Metric Measurement

Module 3: Multi-Digit Multiplication and Division

Module 4: Angle Measure and Plane Figures

Module 5: Fraction Equivalence, Ordering, and Operations

Module 6: Decimal Fractions

Module 7: Exploring Multiplication

Summary of Year

Fourth grade mathematics is about (1) developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends; (2) developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; and (3) understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

Key Areas of Focus for 3-5:	Multiplication and division of whole numbers and fractions—concepts, skills, and problem solving
Required Fluency:	4.NBT.4 Add and subtract within 1,000,000.

CCLS Major Emphasis Clusters
Operations and Algebraic Thinking
• Use the four operations with whole numbers to solve problems.
Number and Operations in Base Ten
• Generalize place value understanding for multi-digit whole numbers.
• Use place value understanding and properties of operations to perform multi-digit arithmetic.
Number and Operations – Fractions
• Extend understanding of fraction equivalence and ordering.
• Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
• Understand decimal notation for fractions, and compare decimal fractions.

Rationale for Module Sequence in Grade 4

In Grade 4, students extend their work with whole numbers. They begin with large numbers using familiar units (tens and hundreds) and develop their understanding of thousands by building knowledge of the pattern of *times ten* in the base ten system on the place value chart (**4.NBT.1**). In

Grades 2 and 3 students focused on developing the concept of composing and decomposing place value units within the addition and subtraction algorithms. Now, in Grade 4, those (de)compositions and are seen through the lens of multiplicative comparison, e.g. 1 thousand is 10 times as much as 1 hundred. They next apply their broadened understanding of patterns on the place value chart to compare, round, add and subtract.   The module culminates with solving multi-step word problems involving addition and subtraction modeled with tape diagrams that focus on numerical relationships.

The algorithms continue to play a part in Module 2 as students relate place value to metric units. This module helps students draw similarities between:

1 ten	= 10 ones
1 hundred	= 10 tens
1 hundred	= 100 ones
1 meter	= 100 centimeters
1 thousand	= 1,000 ones
1 kilometer	= 1,000 meters
1 kilogram	= 1,000 grams
1 liter	= 1,000 milliliters

Students work with metric measurement in the context of the addition and subtraction algorithms, mental math, place value, and word problems. Customary units are used as a context for fractions in Module 5.

In Module 3, measurements provide the concrete foundation behind the distributive property in the multiplication algorithm: 4 × (1 m 2 cm) can be made physical using ribbon, where it is easy to see the 4 copies of 1 m and the 4 copies of 2 cm. Likewise, 4 × (1 ten 2 ones) = 4 tens 8 ones. Students then turn to the place value table with number disks to develop efficient procedures for multiplying and dividing one-digit whole numbers and use the table with number disks to understand and explain why the procedures work. Students also solve word problems throughout the module where they select and accurately apply appropriate methods to estimate, mentally calculate, or use the procedures they are learning to compute products and quotients.

Module 4 focuses as much on solving unknown angle problems using letters and equations as it does on building, drawing, and analyzing two-dimensional shapes in geometry. Students have already used letters and equations to solve word problems in earlier grades. They continue to do so in Grade 4, and now they also learn to solve unknown angle problems: work that challenges students to build and solve equations to find unknown

angle measures. First, students learn the definition of degree and learn how to measure angles in degrees using a circular protractor. From the definition of degree and the fact that angle measures are additive, the following rudimentary facts about angles naturally follow:

1. The sum of angle measurements around a point is 360 degrees.
2. The sum of angle measurements on a line is 180 degrees.
3. Hence, from 1 and 2, students see that vertical angles are equal.
4.

Armed only with these facts, students are able to generate and solve equations as in the following proble:

Find the unknown angle x.
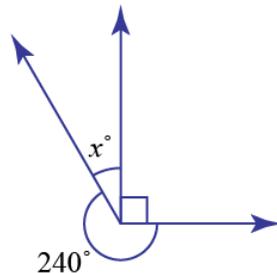
$$X + 240 + 90 = 360$$
$$X + 330 = 360$$
$$X = 30$$

Unknown angle problems help to unlock algebraic concepts for students *because such problems are visual.* The *x* clearly stands for a specific number: If a student wished, he could place a protractor down on that angle and measure it to find *x*. But doing so destroys the joy of deducing the answer and solving the puzzle on his own.

Module 5 centers on equivalent fractions and operations with fractions. We use fractions when there is a given unit, the *whole unit*, but we want to measure using a smaller unit, called the *fractional unit*. To prepare students to explore the relationship between a fractional unit and its whole unit, examples of such relationships in different contexts were already carefully established earlier in the year:

360 degrees in	1 complete turn
100 centimeters in	1 meter
1000 grams in	1 kilogram
1000 milliliters in	1 liter

The beauty of fractional units, once defined and understood, is that they behave just as all other units do:

- "3 fourths + 5 fourths = 8 fourths" just as "3 meters + 5 meters = 8 meters"
- "4 x 3 fourths = 12 fourths" just as "4 x 3 meters = 12 meters"

Students add and subtract fractions with like units using the area model and the number line. They multiply a fraction by a whole number where the interpretation is as repeated addition e.g. 3 fourths + 3 fourths = 2 x 3 fourths. Through this introduction to fraction arithmetic they gradually come to understand fractions as units they can manipulate, just like whole numbers. Throughout the module, customary units of measurement provide a relevant context for the arithmetic.

Module 6, on decimal fractions, starts with the realization that decimal place value units are simply special fractional units: 1 tenth = 1/10, 1 hundredth = 1/100, etc. Fluency plays an important role in this topic as students learn to relate 3/10 = 0.3 = 3 tenths. They also recognize that 3 tenths is equal to 30 hundredths and subsequently have their first experience adding and subtracting fractions with unlike units e.g., 3 tenths + 4 hundredths = 30 hundredths + 4 hundredths.

The year ends with a module focused on multiplication and measurement as they solve multi-step word problems. Exploratory lessons support conceptual understanding of the relative sizes of measurement units. Students explore conversion in hands-on settings and subsequently apply those conversions to solve multi-step word problems involving all operations and multiplicative comparison.

Alignment Chart

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 4 Modules[66]
Module 1: **Place Value, Rounding, and Algorithms for Addition and Subtraction** (25 days)	**Use the four operations with whole numbers to solve problems.[67]** **4.OA.3** Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

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[66] When a cluster is referred to in this chart without a footnote, the cluster is taught in its entirety.

[67] 4.OA.1 and 4.OA.2 are addressed in Modules 3 and 7.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 4 Modules[66]
	Generalize place value understanding for multi-digit whole numbers. (Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.)
	4.NBT.1 Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.*
	4.NBT.2 Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
	4.NBT.3 Use place value understanding to round multi-digit whole numbers to any place.
	Use place value understanding and properties of operations to perform multi-digit arithmetic.[68]
	4.NBT.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.
Module 2: **Unit Conversions and Problem Solving with Metric Measurement** (7 days)	**Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.[69]**
	4.MD.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), …*
	4.MD.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

[68] 4.NBT.5 is addressed in Modules 3 and 7; 4.NBT.6 is addressed in Module 3.

[69] The focus of this module is on the metric system to reinforce place value, mixed units, and word problems with unit conversions. Decimal and fraction word problems wait until Modules 5 and 6. 4.MD.3 is taught in Module 3.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 4 Modules[66]	
Module 3: **Multi-Digit Multiplication and Division** (43 days)	**Use the four operations with whole numbers to solve problems.**	
	4.OA.1	Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 x 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
	4.OA.2	Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison. (See Glossary, Table 2.)
	4.OA.3	Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
	Gain familiarity with factors and multiplies.	
	4.OA.4	Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.
	Use place value understanding and properties of operations to perform multi-digit arithmetic. (Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.)[70]	
	4.NBT.5	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.[71]
	4.NBT.6	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using

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[70] 4.NBT.4 is addressed in Module 1 and is then reinforced throughout the year.

[71] Multiplying two two-digit numbers is addressed in Module 7.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 4 Modules[66]
	equations, rectangular arrays, and/or area models. **Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.[72]** **4.MD.3** Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.*
Module 4: **Angle Measure and Plane Figures** (20 days)	**Geometric measurement: understand concepts of angle and measure angles.** **4.MD.5** Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles. b. An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees. **4.MD.6** Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. **4.MD.7** Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure. **Draw and identify lines and angles, and classify shapes by properties of their lines and angles.** **4.G.1** Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and

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[72] 4.MD.1 is taught in Modules 2 and 7; 4.MD.2 is taught in Modules 2, 5, 6, and 7.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 4 Modules[66]
	parallel lines. Identify these in two-dimensional figures.
	4.G.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.
	4.G.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.
Module 5: **Fraction Equivalence, Ordering, and Operations**[73] (45 days)	**Generate and analyze patterns.** **4.OA.5** Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.* **Extend understanding of fraction equivalence and ordering. (Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.)** **4.NF.1** Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. **4.NF.2** Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model. **Build fractions from unit fractions by applying and extending previous understanding of operations on whole**

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[73] Tenths and hundredths are important fractions in this module, represented in decimal form in Module 6.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 4 Modules[66]
	numbers.
	4.NF.3 Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.
	a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
	b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.*
	c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
	d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.
	4.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.
	a. Understand a fraction a/b as a multiple of $1/b$. For example, use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$.
	b. Understand a multiple of a/b as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as $6/5$. (In general, $n \times (a/b) = (n \times a)/b$.)
	c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat $3/8$ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 4 Modules[66]
	answer lie?
	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.[74]
	4.MD.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
	Represent and interpret data.
	4.MD.4 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.*
Module 6: **Decimal Fractions** (20 days)	**Understand decimal notations for fractions, and compare decimal fractions. (Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.)[75]**
	4.NF.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. (Students who can generate equivalent fractions can develop strategies for adding fractions wit unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade.) *For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.*
	4.NF.6 Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.*
	4.NF.7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons

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[74] 4.MD.1 is taught in Modules 2 and 7. 4.MD.3 is taught in Module 3.

[75] In this module we continue to work with fractions, now including decimal form.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 4 Modules[66]
	are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.
	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.[76]
	4.MD.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
Module 7: **Exploring Multiplication** (20 days)	**Use the four operations with whole numbers to solve problems.**
	4.OA.1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 x 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
	4.OA.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison. (See Glossary, Table 2.)
	4.OA.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
	Use place value understanding and properties of operations to perform multi-digit arithmetic.[77]
	4.NBT.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate

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[76] 4.MD.1 is taught in Modules 2 and 7. 4.MD.3 is taught in Module 3.

[77] In Module 7, the focus is on multiplying two 2-digit numbers.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 4 Modules[66]
	and explain the calculation by using equations, rectangular arrays, and/or area models.
	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.[78]
	4.MD.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), …*
	4.MD.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

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[78] The focus now is on customary units in word problems for application of fraction concepts. 4.MD.3 is taught in Module 3.

Sequence of Grade 5 Modules Aligned with the Standards

Module 1: Place Value and Decimal Fractions

Module 2: Multi-Digit Whole Number and Decimal Fraction Operations

Module 3: Addition and Subtraction of Fractions

Module 4: Multiplication and Division of Fractions and Decimal Fractions

Module 5: Addition and Multiplication with Volume and Area

Module 6: Problem Solving with the Coordinate Plane

Summary of Year

Fifth grade mathematics is about (1) developing fluency with addition and subtraction of fractions, and developing understanding of the multiplication of fractions and of division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions); (2) extending division to two-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations; and (3) developing understanding of volume.

Key Areas of Focus for 3-5: Multiplication and division of whole numbers and fractions—concepts, skills, and problem solving

Required Fluency: 5.NBT.5   Multi-digit multiplication.

CCLS Major Emphasis Clusters
Number and Operations in Base Ten
• Understand the place value system.
• Perform operations with multi-digit whole numbers and with decimals to hundredths.
Number and Operations – Fractions
• Use equivalent fractions as a strategy to add and subtract fractions.
• Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Measurement and Data
• Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

Rationale for Module Sequence in Grade 5

Students' experiences with the algorithms as ways to manipulate place value units in Grades 2-4 really begin to pay dividends in Grade 5. In Module 1, whole number patterns with number disks on the place value table are easily generalized to decimal numbers. As students work word problems with measurements in the metric system, where the same patterns occur, they begin to appreciate the value and the meaning of decimals. Students apply their work with place value to adding, subtracting, multiplying and dividing decimal numbers with tenths and hundredths.
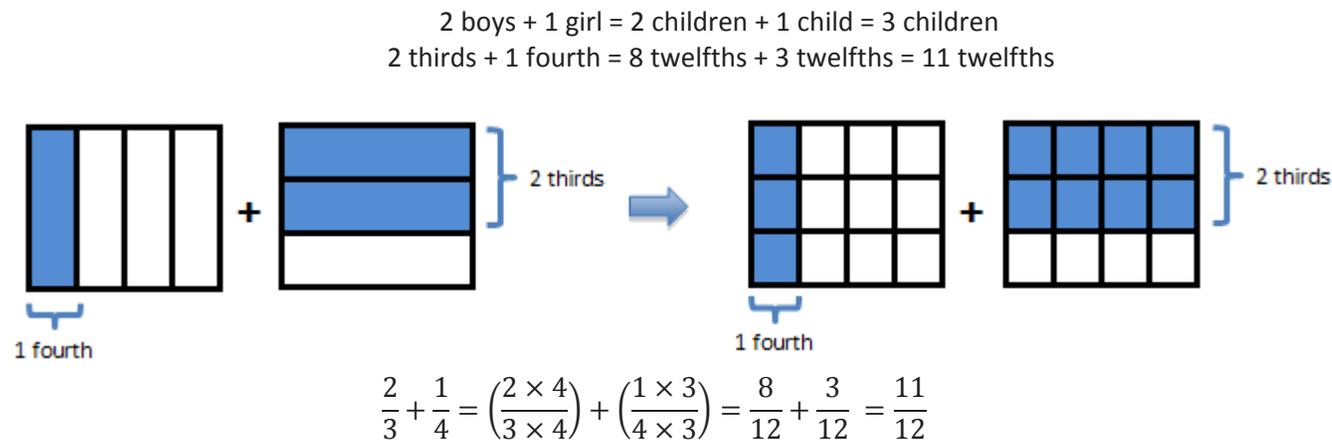
Module 2 begins by using place value patterns and the distributive and associative properties to multiply multi-digit numbers by multiples of 10 and leads to fluency with multi-digit whole number multiplication.[79] For multiplication, students must grapple with and fully understand the distributive property (one of the key reasons for teaching the multi-digit algorithm). While the multi-digit multiplication algorithm is a straightforward generalization of the one-digit multiplication algorithm, the division algorithm with two-digit divisors requires far more care to teach because students have to also learn estimation strategies, error correction strategies, and the idea of successive approximation (all of which are central concepts in math, science, and engineering).

Work with place value units paves the path toward fraction arithmetic in Module 3 as elementary math's place value emphasis shifts to the larger set of fractional units for algebra. Like units are added to and subtracted from like units:

$$1.5 + 0.8 = 1\frac{5}{10} + \frac{8}{10} = 15 \text{ tenths} + 8 \text{ tenths} = 23 \text{ tenths} = 2 \text{ and } 3 \text{ tenths} = 2\frac{3}{10} = 2.3$$

$$1\frac{5}{9} + \frac{8}{9} = 14 \text{ ninths} + 8 \text{ ninths} = 22 \text{ ninths} = 2 \text{ and } 4 \text{ ninths} = 2\frac{4}{9}$$

The new complexity is that when units are not equivalent, they must be changed for smaller equal units so that they can be added or subtracted. Probably the best model for showing this is the rectangular fraction model pictured below. The equivalence is then represented symbolically as students engage in active meaning-making rather than obeying the perhaps mysterious command to "multiply the top and bottom by the same number."

2 boys + 1 girl = 2 children + 1 child = 3 children
2 thirds + 1 fourth = 8 twelfths + 3 twelfths = 11 twelfths

$$\frac{2}{3} + \frac{1}{4} = \left(\frac{2 \times 4}{3 \times 4}\right) + \left(\frac{1 \times 3}{4 \times 3}\right) = \frac{8}{12} + \frac{3}{12} = \frac{11}{12}$$

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[79] Multi-digit decimal multiplication such as 4.1 × 3.4 and division such as 4.5 ÷ 1.5 are studied in Module 4.

Relating different fractional units to one another requires extensive work with area and number line diagrams. Tape diagrams are used often in word problems. Tape diagrams, which students began using in the early grades and which become increasingly useful as students applied them to a greater variety of word problems, hit their full strength as a model when applied to fraction word problems. At the heart of a tape diagram is the now-familiar idea of forming units. In fact, forming units to solve word problems is one of the most powerful examples of the unit theme and is particularly helpful for understanding fraction arithmetic, as in the following example:

Jill had $32. She gave $\frac{1}{4}$ of her money to charity and $\frac{3}{8}$ of her money to her brother. How much did she give altogether?

$32
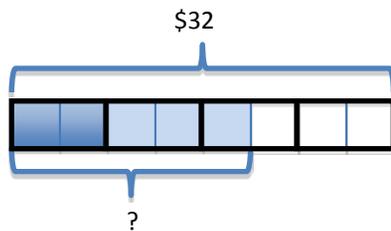
Solution with units:

8 units = $32
1 unit = $4
5 units = $20

Solution with arithmetic:

$$\frac{1}{4} + \frac{3}{8} = \frac{2}{8} + \frac{3}{8} = \frac{5}{8}$$

$$\frac{5}{8} \times 32 = 20$$

Jill gave $20 altogether.

Near the end of Module 4 students know enough about fractions and whole number operations to begin to explore multi-digit decimal multiplication and division. In multiplying 2.1 × 3.8, for example, students now have multiple skills and strategies that they can use to locate the decimal point in the final answer, including:

- Unit awareness: 2.1 × 3.8 = 21 tenths × 38 tenths = 798 hundredths
- Estimation (through rounding): 2.1 × 3.8 ≈ 2 × 4 = 8, so 2.1 × 3.8 = 7.98
- Fraction multiplication: 21/10 × 38/10 = (21 × 38)/(10 × 10)

Similar strategies enrich students' understanding of division and help them to see multi-digit decimal division as whole number division in a different unit. For example, we divide to find, "How many groups of 3 apples are there in 45 apples?" and write 45 apples ÷ 3 apples = 15. Similarly, 4.5 ÷ 0.3 can be written as "45 tenths ÷ 3 tenths" with the same answer: There are 15 groups of 0.3 in 4.5. This idea was used to introduce fraction division earlier in the module, thus gluing division to whole numbers, fractions and decimals together through an understanding of units.

Frequent use of the area model in Modules 3 and 4 prepares students for an in-depth discussion of area and volume in Module 5. But the module on area and volume also reinforces work done in the fraction module: Now, questions about how the area changes when a rectangle is scaled by a whole or fractional scale factor may be asked and missing fractional sides may be found. Measuring volume once again highlights the unit theme, as a unit cube is chosen to represent a volume unit and used to measure the volume of simple shapes composed out of rectangular prisms.

Scaling is revisited in the last module on the coordinate plane. Since Kindergarten where growth and shrinking patterns were first introduced, students have been using bar graphs to display data and patterns. Extensive bar-graph work has set the stage for line plots, which are both the natural extension of bar graphs and the precursor to linear functions. It is in this final module of K-5 that a simple line plot of a straight line is presented on a coordinate plane and students are asked about the scaling relationship between the increase in the units of the vertical axis for 1 unit of increase in the horizontal axis. This is the first hint of slope and marks the beginning of the major theme of middle school: ratios and proportions.

Alignment Chart

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 5 Modules[80]

Module 1:
 	
Place Value and Decimal Fractions
 	
(20 days)
	Understand the place value system.
	
	5.NBT.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
	
	5.NBT.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
	
	5.NBT.3 Read, write, and compare decimals to thousandths.
	
	    a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.
	
	    b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
	
	5.NBT.4 Use place value understanding to round decimals to any place.
	
	Perform operations with multi-digit whole numbers and with decimals to hundredths.[82]
	
	5.NBT.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between

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[80] When a cluster is referred to in this chart without a footnote, the cluster is taught in its entirety.

[82] The balance of this cluster is addressed in Module X.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 5 Modules[80]
	addition and subtraction; relate the strategy to a written method and explain the reasoning used.
	Convert like measurement units within a given measurement system.[83]
	5.MD.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.
Module 2: **Multi-Digit Whole Number and Decimal Fraction Operations** (35 days)	**Write and interpret numerical expressions.[84]** **5.OA.1** Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. **5.OA.2** Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.* **Understand the place value system.[85]** **5.NBT.1** Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. **5.NBT.2** Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. **Perform operations with multi-digit whole numbers and with decimals to hundredths.** **5.NBT.5** Fluently multiply multi-digit whole numbers using the standard algorithm. **5.NBT.6** Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit

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[83] The focus of this module is on the metric system to reinforce place value and writing measurements using mixed units.

[84] These skills are also applied to fractions in this module.

[85] 5.NBT.3 and 5.NBT.4 are taught in Module 1.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 5 Modules[80]	
		divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
	5.NBT.7	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. [86]
	Convert like measurement units within a given measurement system.	
	5.MD.1	Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.
Module 3: **Addition and Subtraction of Fractions** (22 days)	**Use equivalent fractions as a strategy to add and subtract fractions.[87]**	
	5.NF.1	Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*
	5.NF.2	Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*
Module 4: **Multiplication and Division of**	**Write and interpret numerical expressions.**	
	5.OA.1	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with

[86] Focus on decimal multiplication of a single-digit, whole number factor times a multi-digit number with up to 2 decimal places (e.g., 3 x 64.98). Restrict decimal division to a single digit whole number divisor with a multi-digit dividend with up to 2 decimal places (e.g., 64.98 ÷ 3). The balance of the standard is taught in Module 4.

[87] Examples in this module also include tenths and hundredths in fraction and decimal form.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 5 Modules[80]
Fractions and Decimal Fractions (38 days)	these symbols. **5.OA.2** Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.* **Perform operations with multi-digit whole numbers and with decimals to hundredths.[88]** **5.NBT.7** Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. **Apply and extend previous understandings of multiplication and division to multiply and divide fractions.[89]** **5.NF.3** Interpret a fraction as division of the numerator by the denominator ($a/b = a ÷ b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?* **5.NF.4** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product (a/b) × q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a × q ÷ b$. *For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)*

[88] 5.NBT.5 and 5.NBT.6 are taught in Module 2. Teach problems such as 2.7 x 2.1 and 4.5 ÷ 1.5. See "Progressions" pgs. 17 – 18 (http://commoncoretools.files.wordpress.com/2011/04/ccss_progression_nbt_2011_04_073.pdf).
[89] The focus of 5.NF.4 in this module is only on part a; 5.NF.4b is taught in Module 5. Include problems involving decimal fractions throughout the cluster.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 5 Modules[80]
	5.NF.5 Interpret multiplication as scaling (resizing), by: a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1. **5.NF.6** Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem. **5.NF.7** Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. (Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement at this grade.) a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$. b. Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$. c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of*

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 5 Modules[80]
	raisins?
	Convert like measurement units within a given measurement system.[90]
	5.MD.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.
	Represent and interpret data.
	5.MD.2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*
Module 5: **Addition and Multiplication with Volume and Area** (25 days)	**Apply and extend previous understandings of multiplication and division to multiply and divide fractions.[91]**
	5.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
	b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.
	5.MD.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

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[90] The focus of 5.MD.1 in this module is on the customary system of units as a means of introducing fractions (e.g., 1 inch is 1/12 foot, 1 foot is 1/3 yard, etc.).

[91] 5.NF.3 is taught in Module 3; 5.NF.4a, 5.NF.5, 5.NF.6, and 5.NF.7 are taught in Module 4. In this module 5.NF.4b is applied to multiplying to find volume and area. 5.NF.4b certainly includes decimal fraction side lengths of sides of a rectangle (in both fraction and decimal form).

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 5 Modules[80]
	a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.
	b. A solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of *n* cubic units.
	5.MD.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.
	5.MD.5 Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.
	a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
	b. Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.
	c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.
	Classify two-dimensional figures into categories based on their properties.
	5.G.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.
	5.G.4 Classify two-dimensional figures in a hierarchy based on properties.

Module and Approximate Number of Instructional Days	Common Core Learning Standards Addressed in Grade 5 Modules[80]
Module 6: **Problem Solving with the Coordinate Plane** (40 days)	**Write and interpret numerical expressions.**[92] **5.OA.2** Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.* **Analyze patterns and relationships.** **5.OA.3** Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.* **Graph points on the coordinate plane to solve real-world and mathematical problems.** **5.G.1** Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate). **5.G.2** Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

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[92] 5.OA.1 is taught in Modules 2 and 4.

	Pre-Kindergarten	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5		2015-16*
1st TRIMESTER	M1: Counting to 5 (45 days)	M1: Numbers to 10 (43 days)	M1: Sums and Differences to 10 (45 days)	M1: Sums and Differences to 100 (10 days)	M1: Properties of Multiplication and Division and Solving Problems with Units of 2-5 and 10 (25 days)	M1: Place Value, Rounding, and Algorithms for Addition and Subtraction (25 days)	M1: Place Value and Decimal Fractions (20 days)	**1st QUARTER**	
				M2: Addition and Subtraction of Length Units (12 days)					
		**M2: 2D and 3D Shapes (12 days)		M3: Place Value, Counting, and Comparison of Numbers to 1,000 (25 days)	M2: Place Value and Problem Solving with Units of Measure (25 days)	**M2: Unit Conversions (7 days)	M2: Multi-Digit Whole Number and Decimal Fraction Operations (35 days)	**2nd QUARTER**	
	M2: Shapes (15 days)		M2: Introduction to Place Value Through Addition and Subtraction Within 20 (35 days)			M3: Multi-Digit Multiplication and Division (43 days)			
2nd TRIMESTER	M3: Counting to 10 (50 days)	M3: Comparison of Length, Weight, Capacity, and Numbers to 10 (38 days)		M4: Addition and Subtraction Within 200 with Word Problems to 100 (35 days)	M3: Multiplication and Division with Units of 0, 1, 6-9, and Multiples of 10 (25 days)		M3: Addition and Subtraction of Fractions (22 days)		
			M3: Ordering and Comparing Length Measurements as Numbers (15 days)						
				M5: Addition and Subtraction Within 1,000 with Word Problems to 100 (24 days)	M4: Multiplication and Area (20 days)	M4: Angle Measure and Plane Figures (20 days)	M4: Multiplication and Division of Fractions and Decimal Fractions (38 days)	**3rd QUARTER**	
		M4: Number Pairs, Addition and Subtraction to 10 (47 days)	M4: Place Value, Comparison, Addition and Subtraction to 40 (35 days)						
3rd TRIMESTER	M4: Comparison of Length, Weight, Capacity, and Numbers to 5 (35 days)			M6: Foundations of Multiplication and Division (24 days)	M5: Fractions as Numbers on the Number Line (35 days)	M5: Fraction Equivalence, Ordering, and Operations (45 days)			
			M5: Identifying, Composing, and Partitioning Shapes (15 days)				M5: Addition and Multiplication with Volume and Area (25 days)		
		M5: Numbers 10-20 and Counting to 100 (30 days)		M7: Problem Solving with Length, Money, and Data (30 days)	M6: Collecting and Displaying Data (10 days)			**4th QUARTER**	
	M5: Addition and Subtraction Stories and Counting to 20 (35 days)		M6: Place Value, Comparison, Addition and Subtraction to 100 (35 days)		M7: Geometry and Measurement Word Problems (40 days)	M6: Decimal Fractions (20 days)	M6: Problem Solving with the Coordinate Plane (40 days)		
		M6: Analyzing, Comparing, and Composing Shapes (10 days)		M8: Time, Shapes, and Fractions as Equal Parts of Shapes (20 days)		M7: Exploring Measurement with Multiplication (20 days)			
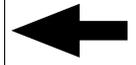
Approx. test date for grades 3-5

Key:			
Number	Geometry	Number and Geometry, Measurement	Fractions

*The columns indicating trimesters and quarters are provided to give you a rough guideline. Please use this additional column for your own pacing considerations based on the specific dates of your academic calendar.

**Please refer to the modules themselves to identify partially labeled titles as well as the standards corresponding to all modules.

EUREKA MATH™

A Story of Units: Curriculum Map for Grades PK-5
Date: 7/26/15

Achieving Excellence Academy of Charlotte Charter School Calendar
2020 - 2021

<u>Dates</u>	<u>Descriptions</u>
August 10 & August 11	New Student orientation (K-4)
August 12-14	New Teacher Induction (NTI)
August 17 -21	Returning Teacher Orientation (RTO)
August 24	First day of school
September 7	Labor Day Holiday – School closed
September 24	Progress Reports
September 28	Parent Conferences – School closed
October 12-16	National Custodian Appreciation week
October 25	End Quarter 1 (Fall School Picture day)
October 26	Teacher Workday – School closed
October 30	Report Cards
November 11	Veterans Day Observed – School closed
November 20	Parent appreciation day-early dismissal
November 25-30	Thanksgiving Holiday – School closed
December 6	Progress Reports
December 22	Early dismissal
December 23– January 1	Winter Break – School closed
January 2	Professional Development-School closed
January 4	Students return to school
January 17	End Quarter 2
January 18	Teacher Workday No school for Students
January 20	MLK Jr. Holiday – School closed
January 24	Report Cards
February 3- 7	School Counselors Appreciation week
February 12	Parent Conference -School closed
February 17	Presidents Day – School closed
February 27	Progress Reports
March 21	End Quarter 3
March 22	Teacher Workday – No school for Students
March 28	Report Cards
March 29- 4/15	Spring Break- School closed
April 19-23	Administrative Professionals Week
April 29	Progress Reports
May 4- May 8	Teacher Appreciation week
May 17 – 31	Benchmark Testing Exams
May 27	Memorial Day – School closed
May 31	End Quarter 4 (Spring Pictures Day)
June 3-11	End of Year assessments
June 14- 16	End of year field trips
June 17	Student appreciation Day
June 19	Promotion Ceremony -Early dismissal/Last day of school
June 9- 13th	Teacher workdays
June 21	Summer Enrichment program begins
July 2- July 10	Fourth of July celebration-School closed
August 7	Summer Enrichment program ends

Achieving Excellence Academy of Charlotte Charter School Calendar

2020 - 2021

N.C. GEN. STAT. § 115C84.2(a)(1),(d)]: 180 student instructional days per year
  **Schedule might need to be adjusted due to testing requirement

(331 student instructional days per year at Achieving Excellence Academy of Charlotte Charter School)
August 31 days
September 28 days
October 29 days
November 24 days
December 34 days
January 28 days
February 24 days
March 26 days
April 27 days
April 27 days
May 14 days
June 30 days
July 21 days
August 25 days

Achieving Excellence Academy of Charlotte
Organizational Chart

Board of Directors

Subcommittees & task force

Executive Director/ School Leader

Parent Teacher Advisory Committe /PTA

Asst. Principal

Director of Student Support Services

Faculty & staff, counselors

Director of Facilities

EC, ELL, Speciality teachers.EF Coaches

Custodians/ security
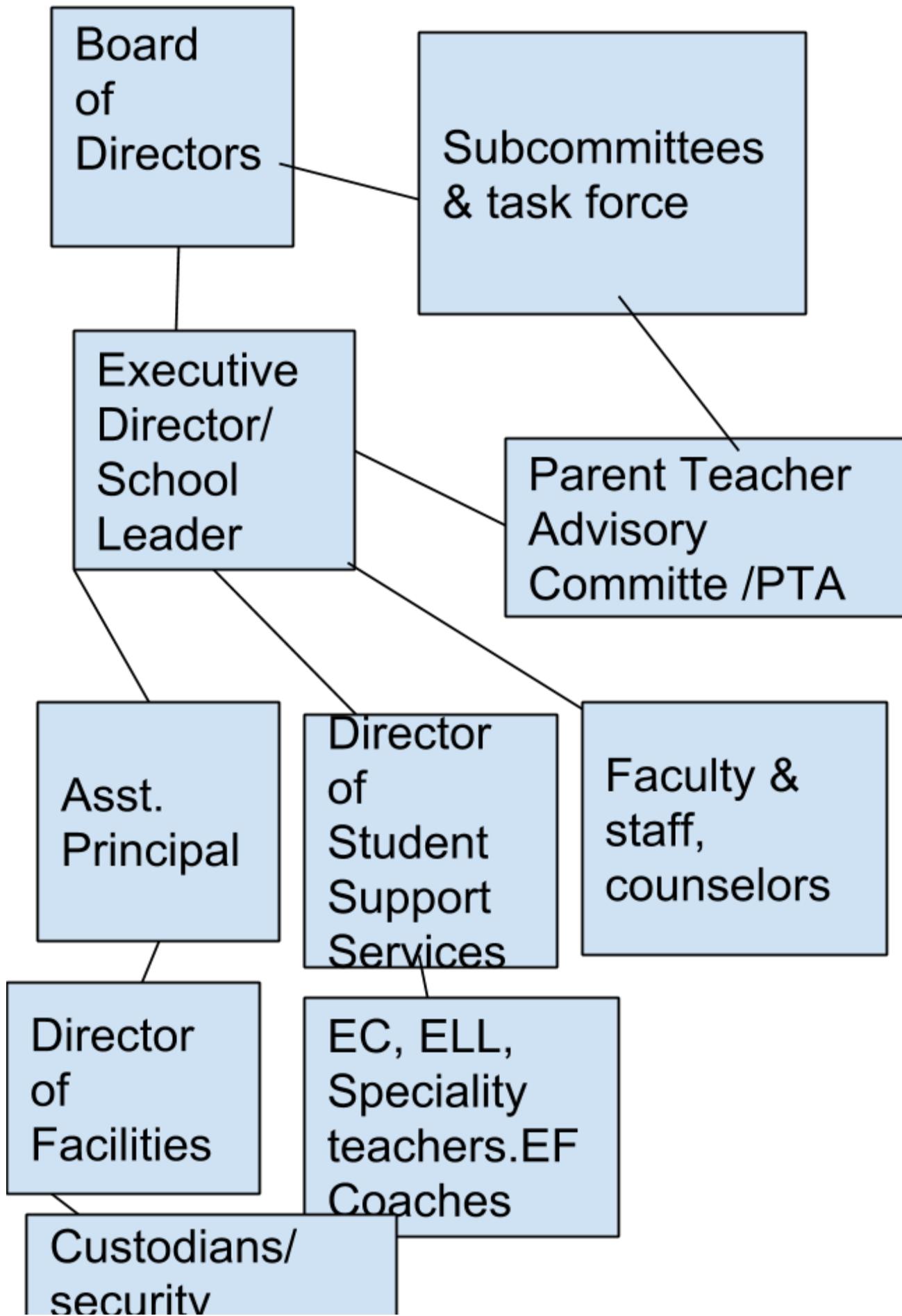
BYLAWS OF THE BOARD OF DIRECTORS OF RESILIENCE CHARTER SCHOOL, INC.

ARTICLE I: General Section

Section 1. NAME. The name of the corporation is Achieving Excellence Academy of Charlotte Charter School, Inc. (the "Corporation").

Section 2. INITIAL REGISTERED OFFICE AND INITIAL REGISTERED AGENT: United States Corp Agents inc. 6135 Park South Drive, Suite 50, Charlotte, NC, 28210.

Section 3. PURPOSE. The corporation has been organized exclusively for charitable, educational, literary and scientific purposes within the meaning of section 501 (c) (3) of the Internal Revenue Code of 1986 or the corresponding provision of any future United States Internal Revenue Code. The Corporation has been created to provide the governance for Achieving Excellence Academy of Charlotte Charter School ("the school"). The school is designed to improve student learning and academic achievement with the use of innovative learning methods in compliance with North Carolina State Statutes. The school shall be nonsectarian in its programs, admission policies, employment practices and operations and will admit students without regard to sex, race, color, creed, religion, or ethnic or national origin in the same manner as other public schools.The Corporation shall have no members. The Board of Directors shall have all powers and duties to conduct the activities of the Corporation. The Board of Directors shall be devoted to the mission and purpose of the school and shall represent the best interests of the community in accordance of NC Open Meetings law and the articles of incorporation.

Section 4. MISSION. It is the mission of Achieving Excellence Academy of Charlotte Charter School to motivate, inspire, support, mentor and educate our students through a rigorous interdisciplinary, technology enhanced,specialized STEAM curriculum, to prepare our students for the 21 century and to unlock each students full potential to achieve excellence in school,college and in life. It is the school's mission to attain highly skilled educators to provide explicit,specialized instruction in the areas of Science, Technology, Engineering,Math, English, History,Foreign Language,Fine Arts & leadership development to support economically disadvantaged students with learning difficulties,limited English proficiency & intellectual disabilities to matriculate through the North Carolina Common Core curriculum at a pace that supports student growth and enhances student performance.

Section 5. LIMITATIONS. The following are limitations on the activities, purposes and organization of the Corporation: The Corporation is not organized for and is not to be operated for gain or profit. b. No part of the property of the Corporation and no part of its income or earnings are to accrue to the benefit of any Director or other private individual, except for reasonable compensation for performance of duties. c. The Corporation is prohibited from engaging in any activity contrary to the purposes for which the Corporation is organized.

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Section 6. FISCAL YEAR. The fiscal year of the Corporation shall begin on the first day of July and end on the last day of June.

Section 7. ADOPTION OF RULES. The Board of Directors shall act under the Simplified Robert's Rules of Order.

ARTICLE II: Board of Directors

Section 8. FUNCTIONS. The affairs of the Corporation shall be managed and conducted by, and under the supervision of, the Board of Directors, subject to the provisions of the Articles of Incorporation (the "Articles") and these Bylaws.

Section 9. NUMBER AND QUALIFICATION. The Board of Directors shall have the number of members, not less than four or more than eighteen, as designated by resolution of the Board of Directors. Each member of the board should have the credibility and respect of the community and the Board should reflect the community's diversity. The Board is designed to bring expertise to the governance of the school. Specifically, at least one of the voting board members shall have education, training and experience in the field of business, preferably non profit management;at least one of the voting board members shall have education, training and experience in the field of education;at least one of the voting board members shall have education, training and experience in the field of finance and at least one board member shall be a parent of a current student at the school. These skills help ensure the success of the organization having individuals with experiences that can guide the board as a group. The primary board function is to establish operating policies and procedures for the nonprofit corporation, approve the hiring of school faculty, and provide oversight of the schools operations, budget, and curriculum.

Section 10. CHAIR. The Chair shall be the principal officer(Board President) of the corporation. Subject to the direction and control of the board of directors, he or she shall, when present, preside at all meetings of the board of directors and, with the assistance of the board of directors, establish the agenda for all meetings. The Chair shall appoint and be an exofficio member of all committees and other boards. The Chair shall, with the Secretary or any other officer of the corporation authorized by the board of directors, execute any deed, mortgage, lease, bond or other instrument which the board of directors has authorized to be executed, except in cases where the signing and execution thereof shall be expressly delegated by the board of directors or by these Bylaws to some other officer or agent of the corporation, or shall be required by law to be otherwise signed or executed. The Chair shall perform all duties incident to the office of Chair and such other duties as may be prescribed by the board of directors of the corporation.

Section 11. VICE CHAIR. The Vice Chair shall perform such duties which may be specified by the board of directors of the corporation and/or by the Chair. The Vice chair shall preside at all

meetings of the board of directors and, with the assistance of the board of directors, establish the agenda for all meetings.

Section 12. SECRETARY. The Secretary shall (a) record the minutes, or provide for the recording, of the minutes of all meetings of the board of directors of the corporation in one or more books provided for that purpose; (b) see that all notices are duly given in accordance with the provisions of these Bylaws or as required by law; (c) be a custodian of the corporate records and of the seal of the corporation; (d) chair the Nominating and Governance Committee; and (e) perform all the duties incident to the office of Secretary and such other duties as from time to time may be assigned to him or her by the Chair or by the board of directors of the corporation.

Section 13. TREASURER. The Treasurer shall (a) shall oversee and supervise the corporation's accounting practices and financial operations employees; (b) shall be responsible for the maintenance of adequate books of account for the BYLAWS of Achieving Excellence Academy of Charlotte Charter school corporation; (c) have charge over all funds and securities of the corporation, and be responsible therefore, and for the receipt and disbursement thereof; (d) chair the Finance Committee; (e) present reports of the corporation's financial information to the board of directors on a regular and timely basis; and (f) perform all the duties incident to the office of Treasurer and such other duties as from time to time may be assigned to him or her by the Chair or by the board of directors of the corporation.

Section 14. SCHOOL DIRECTOR AND EXECUTIVE DIRECTOR. The School Director shall be the principal professional employee of the corporation, and instructional leader of the school. The School Director shall have plenary oversight and authority over all employees of the corporation, including, but not limited to, the authority to employ and discharge any and all of the employees of the corporation,ensuring that all staff receive an orientation to the organization, that appropriate training is provided to staff,implementation of a performance management process for all staff,provide staff with coaching and mentoring as appropriate to improve performance,create a climate hospitable to education, improve instruction and manage staff and student performance data, handle staff and or student discipline when necessary using appropriate techniques and other duties assigned by the Board & or Executive Director/Founder. The Executive DIrector/Founder is responsible for overseeing the administration, programs and strategic plan of the organization. Other key duties include fundraising, marketing, and community outreach. The Executive Director performs some or all of the following: *Leadership:*Participates with the Board of Directors in developing a vision and strategic plan to guide the organization,identify, assess, and inform the Board of Directors of internal and external issues that affect the organization; act as a spokesperson for the organization,conduct official correspondence on behalf of the Board as appropriate and jointly with the Board when appropriate,represent the organization at community activities to enhance the organization's community profile,development og an operational plan which incorporates goals and objectives that work towards the strategic direction of the organization,oversee the efficient and effective day-to-day operation of the organization,draft policies for the approval of the Board and prepare procedures to implement the organizational policies; ensure that the

programs and services offered by the organization contribute to the organization's mission and reflect the priorities of the Board.work with staff and the Board (Finance Committee) to prepare a comprehensive budget, secure adequate funding for the operation of the organization, write funding proposals to increase the funds of the organization,communicate with stakeholders to keep them informed of the work of the organization and to identify changes in the community served by the organization,establish good working relationships and collaborative arrangements with community groups, funders, politicians, and other organizations to help achieve the goals of the organization and identify and evaluate the risks to the organization's people,property, finances, goodwill, and image and implement measures to control risks and other duties as deemed necessary in accordance with school policies,bylaws and articles of incorporation.

Section 14. COMMITTEES: EXECUTIVE COMMITTEE. The Executive Committee shall be a standing committee of the corporation. The Executive Committee shall consist of the officers of the corporation, and such members-at-large as selected by the Chair. The number of members of the Executive Committee shall not, in any event, exceed seven (7) in number. The Executive Committee shall manage the affairs of the corporation between meetings of the board of directors. It shall do so in accordance with the policies of the corporation as established by the board of directors. The Executive Committee shall have and exercise the authority of the board of directors of the corporation in the management of the corporation; provided, however, the board of directors may by resolution limit the authority of the Executive Committee and all actions of the Executive Committee shall be reported to the board of directors of the corporation. The Chair or, in his or her absence, the Vice Chair or any other appointed Executive Committee member shall preside at the meetings of the Executive Committee.

Section 15. NOMINATING AND GOVERNANCE COMMITTEE. The Nominating and Governance Committee shall be a standing committee of the corporation. This Committee shall be chaired by the Secretary of the board, consist of not less than two (2), nor more than five (5), members of the board of directors of the corporation and/or such other persons as the Chair may designate, as appointed by the Chair. The Nominating and Governance Committee shall have the responsibility and authority to nominate members of the board of directors, recommend to the board of directors of the corporation a slate of officers of the corporation and the responsibility and authority to propose changes to the bylaws, policies and practices to ensure compliance with current North Carolina statutes and regulations.

Section 16. FINANCE COMMITTEE. The Finance Committee shall be a standing committee of the corporation. It shall be chaired by the Treasurer of the board, consist of not less than two (2), nor more than five (5), members of the board of directors of the corporation and/or such other persons as the Chair may designate, as appointed by the Chair. The Finance Committee shall assist in the preparation of the annual budget of the corporation and shall have such other responsibilities with respect to the financial affairs of the corporation as are conferred upon it from time to time by the board of directors of the corporation.

Section 17. OTHER COMMITTEES. In addition to the Executive Committee, the Nominating and Governance Committee and the Finance Committee shall be standing committees, the board of directors of the corporation, by resolution adopted by a majority of the directors of the corporation then in office, may designate one or more special committees, each of which will consist of one (1) or more directors of the corporation and/or such other persons as the Chair designates. All such committee members shall be appointed by the Chair and shall serve at the pleasure of the board of directors of the corporation

ARTICLE III: Meetings

Section 18. ANNUAL MEETINGS. The board of directors shall meet quarterly in the months of September, November,January, April, July, via video web conferencing and in person when applicable on specific dates to be selected by the board. The board shall hold an annual meeting during April of each year for the election of directors and for the transaction of any other business properly presented at the meeting. Notice of the annual meeting shall be given in writing to each trustee at least 14 days before the meeting. Non-voting members include the students under the age of 18, teachers, and school personnel will not have any voting rights. Each member of the Board of Directors,shall serve for a term of two years with the opportunity to be re-elected to their positions every two years. Board member positions will expire on June 30th and elections will be held during the April quarterly Board of Directors meeting.

Section 19. OTHER REGULAR MEETINGS. The board of directors shall hold at least two regular meetings (other than the annual meeting) during each fiscal year, and may hold other regular meetings from time to time, as determined by resolutions of the board. Notice of regular meetings shall be given in writing to each trustee at least seven days before the meeting.

Section 20. SPECIAL MEETINGS. The chairman of the board may call a special meeting of the board of directors at any time, and shall call a special meeting at the request of the Executive Committee or subcommittees. Notice of special meetings shall be given in writing to each member at least seven days before the meeting.

Section 21. QUORUM AND APPROVAL OF ACTIONS. A majority of the directors in office immediately before a meeting begins shall constitute a quorum for the transaction of any business properly to come before the Board of Directors. Members can attend board meetings in person, through online web conferencing and via phone conferencing means where their voice can be heard. Members attending online or by telephone will be counted to constitute a quorum.

Section 22. VACANCIES. Any vacancy occurring in the board of directors of the corporation to be filled by reason of an increase in the number of directors or because of a vacancy on the board shall be filled by the board of directors of the corporation at any regular or special meeting of the board of directors upon recommendation of the Nominating and Governance Committee

or upon nomination by any director, unless the Articles of Incorporation, a statute, or these Bylaws provide that a vacancy or a directorship so created shall be filled in some other manner, in which case such provision shall control. A director elected or appointed, as the case may be, to fill a vacancy shall be elected for the unexpired term of his or her predecessor in office.

Section 23. RESIGNATION AND REMOVAL OF DIRECTORS. A director may resign at any time or may be removed with or without cause by the affirmative vote of the majority of the directors of the corporation then in office. A director who is absent from three (3) consecutive regular meetings of the board of directors without having been excused by the Chair MAY lose his or her membership on the board of directors, provided that such director shall first have been notified in writing by the Secretary that he or she has been absent from two (2) consecutive regular meetings of the board of directors.

ARTICLE IV: Conflict of Interest

Section 24. CONFLICT OF INTEREST. It is the policy of the Corporation and its Board of Directors that the Corporation's directors, officers, and employees carry out their respective duties in a fashion that avoids actual, potential, or perceived conflicts of interest. The Corporation's directors, officers, and employees shall have the continuing, affirmative duty to report any personal ownership, interest, or other relationship that might affect their ability to exercise impartial, ethical, and business-based judgments in fulfilling their responsibilities to the Corporation. This policy shall be further subject to the following principles:

a. Directors, officers, and employees of the Corporation shall conduct their duties with respect to potential and actual grantees, contractors, suppliers, agencies, and other persons transacting or seeking to transact business with the Corporation in a completely impartial manner, without favor or preference based upon any consideration other than the best interests of the Corporation.

b. Directors, officers, and employees of the Corporation shall not seek or accept for themselves or any of their relatives (including spouses, ancestors, and descendants), from any person or business entity that transacts or seeks to transact business with the Corporation, any gifts, entertainment, or other favors relating to their positions with the Corporation that exceed common courtesies consistent with ethical and accepted business practices.

c. If a director, or a director's relative, directly or indirectly owns a significant financial interest in, or is employed by, any business entity that transacts or seeks to transact business with the Corporation, the director shall disclose that interest or position and shall refrain from voting on any issue pertaining to the transaction.

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d. Officers and employees of the Corporation shall not conduct business on behalf of the Corporation with a relative or a business entity in which the officer, employee, or his or her relative owns a significant financial interest or by which such officer, employee, or relative is employed, except where such dealings have been disclosed to, and specifically approved and authorized by, the Board of Directors of the Corporation.

e. The Board of Directors may require the Corporation's directors, officers, or employees to complete a disclosure statement at any relevant point regarding any actual or potential conflict of interest described in these Bylaws. The disclosure statement shall be in such form as may be prescribed by the Board and may include information regarding a person's participation as a director, trustee, officer, or employee of any other nonprofit organization. The Board of Directors shall be responsible for oversight of all disclosures or failures to disclose and for taking appropriate action in the case of any actual or potential conflict of interest transaction.

F. Effect of Conflict Provisions. The failure of the Corporation, its Board of Directors, or any or all of its directors, officers, or employees to comply with the conflict of interest provisions of these Bylaws shall not invalidate, cancel, void, or make voidable any contract, relationship, action, transaction, debt, commitment, or obligation of the Corporation that otherwise is valid and enforceable under applicable law.

ARTICLE V: Grievances and Confidentiality

Section 25. GRIEVANCES. Individual Board members shall be free to receive complaints and grievances,they will remain neutral while the dispute is pending. The grievant may file a grievance regarding any issue the individual believes adversely impacts them, including decisions of the school administrator, conflicts between employees, conflicts between parents and employees, and conflicts between students and employees. Where the concern or complaint directly pertains to the Boards own actions or policy, the person making the complaint may request Board Members to place it on the Board agenda. The School Leader or Executive Director, will also periodically inform the Board of all complaints and grievances which were referred to this individual designee to be added to the agenda. The full Board of Directors may conduct a full hearing on any appeal or direct grievance. The grievant shall have the right to legal counsel, paid by themselves, at any hearing. The parties in a grievance shall have the right to present evidence, witnesses, including documents and other information. The board of directors decision is final and the person who initiated the complaint or grievance will be advised of the decision in a timely manner in written form. The Board cannot discuss any confidential matter publicly, such as a personnel. parent or student grievances or any confidential information about a student. Any appeals and grievances shall be subject to N.C. Open Meetings Laws and the N.C. Public Records Act.

Section 26. CONFIDENTIALITY. Directors shall not discuss or disclose information about the Corporation or its activities to any person or entity unless such information is already a matter of public knowledge, such person or entity has a need to know, or the disclosure of such information is in furtherance of the Corporations' purposes, or can reasonably be expected to benefit the Corporation. Directors shall use discretion and good business judgment in discussing the affairs of the Corporation with third parties. Without limiting the foregoing, Directors may discuss upcoming fundraisers and the purposes and functions of the Corporation, including but not limited to accounts on deposit in financial institutions. Each Director shall execute a confidentiality agreement consistent herewith upon being voted onto and accepting appointment to the Board of Directors.

Section 27. INDEMNIFICATION BY THE CORPORATION. To the extent not inconsistent with applicable law, every person (and the heirs and personal representatives of such person) who is or was a director, officer, employee, or agent of the Corporation shall be indemnified by the Corporation against all liability and reasonable expense that may be incurred by him or her in connection with or resulting from any claim, action, suit, or proceeding (a) if such person is wholly successful with respect thereto or (b) if not wholly successful, then if such person is determined to have acted in good faith, in what he or she reasonably believed to be the best interests of the Corporation (or, in any case not involving the person's official capacity with the Corporation, in what he or she reasonably believed to be not opposed to the best interests of the Corporation), and, with respect to any criminal action or proceeding, is determined to have had reasonable cause to believe that his or her conduct was lawful (or no reasonable cause to believe that the conduct was unlawful).

Section 28. Purchase of Insurance. The Board of Directors authorizes and empowers the School Leader to purchase insurance covering the Corporation's liabilities and obligations under this Article VI and insurance protecting the Corporation's directors, officers, employees, agents, or other persons.

Section 29. Contracts, Checks, Loans, Deposits and Gifts. The Board of Directors may authorize one (1) or more officers, agents, or employees of the Corporation to enter into any contract or execute any instrument on its behalf. Such authorization may be general or confined to specific instances. Unless so authorized by the Board of Directors, no officer, agent, or employee shall have any power to bind the Corporation or to render it liable for any purpose or amount. All checks, drafts, or other orders for payment of money by the Corporation shall be signed by such person or persons as the Board of Directors may designate by resolution. Such designation may be general or confined to specific instances. Loans. Unless authorized by the Board of Directors, no loan shall be made by or contracted for on behalf of the Corporation and no evidence of indebtedness shall be issued in its name. Such authorization may be general or confined to specific instances. Deposits. All funds of the Corporation shall be deposited to its credit in such bank, banks, or depositories as the Board of Directors may designate. Such designation may be general or confined to specific instances. Gifts.

The Board of Directors may accept on behalf of the Corporation any gift, grant, bequest, devise, or other contribution for the purposes of the Corporation on such terms and conditions as the Board of Directors shall determine.

ARTICLE VI: Dissolution and amendments

Section 30. DISSOLUTION. Upon dissolution of the Corporation, the Board of Directors shall, after paying or making provision for payment of all liabilities of the Corporation, including the costs and expenses of such dissolution, dispose of all the assets of the Corporation exclusively for the exempt purposes of the Corporation or distributed to an organization described in Section 501 (c)(3) or 170 (c)(2) of the Internal Revenue Code, or the corresponding provisions of any future federal tax code, or shall be distributed to the federal government, or to a state or local government, for a public purpose,such assets not disposed of shall be disposed of by a court of competent jurisdiction in the county in which the principal office of the corporation is then located, exclusively for such purposes or to such organization or organizations, as said Court shall determine, which are organized and operated exclusively for such purposes. None of the assets will be distributed to any officer or director of the Corporation. If a charter is not renewed or is terminated, the Executive Director/Founder will work with the Board to determine all options including, but not limited to, converting to a private school,alternative education setting, virtual school and or dissolution. In the event of a voluntary or involuntary dissolution of the charter school, the funds reserved for closure proceedings shall be used to pay wages owed to charter school employees and funds owed to the employees health plan. Other expenses shall be paid from the remaining balance in the funds reserved for closure proceedings.

Section 31. AMENDMENTS: These Bylaws may be amended upon reasonable prior notice at any regular or special meeting of the Board by affirmative vote of at least 2/3 members present.

Scan to verify online.

NORTH CAROLINA
Department of the Secretary of State

To all whom these presents shall come, Greetings:

I, Elaine F. Marshall, Secretary of the State of North Carolina, do hereby certify the following and hereto attached to be a true copy of

ARTICLES OF INCORPORATION

OF

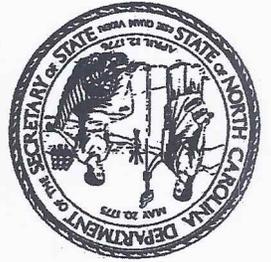**ACHIEVING EXCELLENCE ACADEMY OF CHARLOTTE SCHOOL INCORPORATED**

the original of which was filed in this office on the 9th day of July, 2018.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal at the City of Raleigh, this 9th day of July, 2018.

Elaine F. Marshall

Secretary of State

Date of this notice: 06-28-2018

Employer Identification Number:
83-1053821

Form: SS-4

Number of this notice: CP 575 E

ACHIEVING EXCELLENCE ACADEMY OF
CHARLOTTE CHARTER SCHOOL INC
% JEANNINE L CARRINGTON
2230 E FRANKLIN BLVD NUM 238
GASTONIA, NC 28054

For assistance you may call us at:
1-800-829-4933

IF YOU WRITE, ATTACH THE
STUB AT THE END OF THIS NOTICE.

WE ASSIGNED YOU AN EMPLOYER IDENTIFICATION NUMBER

Thank you for applying for an Employer Identification Number (EIN). We assigned
you EIN 83-1053821. This EIN will identify you, your business accounts, tax returns,
and documents, even if you have no employees. Please keep this notice in your
permanent records.

When filing tax documents, payments, and related correspondence, it is very
important that you use your EIN and complete name and address exactly as shown above.
Any variation may cause a delay in processing, result in incorrect information in your
account, or even cause you to be assigned more than one EIN. If the information
is not correct as shown above, please make the correction using the attached tear-off
stub and return it to us.

When you submitted your application for an EIN, you checked the box indicating
you are a non-profit organization. Assigning an EIN does not grant tax-exempt status
to non-profit organizations. Publication 557, Tax-Exempt Status for Your
Organization, has details on the application process, as well as information on
returns you may need to file. To apply for recognition of tax-exempt status under
Internal Revenue Code Section 501(c)(3), organizations must complete a Form
1023-series application for recognition. All other entities should file Form 1024 if
they want to request recognition under Section 501(a).

Nearly all organizations claiming tax-exempt status must file a Form 990-series
annual information return (Form 990, 990-EZ, or 990-PF) or notice (Form 990-N)
beginning with the year they legally form, even if they have not yet applied for or
received recognition of tax-exempt status.

Unless a filing exception applies to you (search www.irs.gov for Annual Exempt
Organization Return: Who Must File), you will lose your tax-exempt status if you fail
to file a required return or notice for three consecutive years. We start calculating
this three-year period from the tax year we assigned the EIN to you. If that first
tax year isn't a full twelve months, you're still responsible for submitting a return
for that year. If you didn't legally form in the same tax year in which you obtained
your EIN, contact us at the phone number or address listed at the top of this letter.

For the most current information on your filing requirements and other important
information, visit www.irs.gov/charities.

Achieving Excellence Academy of Charlotte Charter school is in the process of determining whether our school should consider contracting with the EMO(Charter School USA). Presently,our school does not have a contract with this EMO at this time.

Achieving Excellence Academy of Charlotte proposes to contract will the EMO()Charter School USA due to their wealth of expertise developing and managing successful charter schools. Charter School USA supports charter schools with feasibility studies,securing community support,facility acquisition,charter applications,curriculum development

lesson and learning plan implementation,classroom management,performance monitoring,customized improvement plans,human resource management,professional development,employee payroll and benefits personnel policies and procedures,government compliance and reporting,financial management,accounting systems,budget development , governmental reporting and analyses,risk management,Fundraising,marketing,student enrollment & tracking, financing and much more. There are no fees associated with contracting with Charter School USA. No other EMO's were contacted because Charter School USA is highly regarded as the top EMO in this region due to their high success rates. However to be clear, Achieving Excellence Academy of Charlotte Charter school has not signed any agreements with any EMO or CMO's.

CSUSA Network Fund Balances

State	School Name	2016 Year End Unassigned Fund Balance	2015 Year End Unassigned Fund Balance	2014 Year End Unassigned Fund Balance
Florida	Aventura City of Excellence School	Do Not Manage Finances	Do Not Manage Finances	Do Not Manage Finances
Florida	Bonita Springs Charter School	391,642	190,601	153,172
Florida	Canoe Creek Charter Academy	349,314	35,481	134,544
Florida	Cape Coral Charter School	292,697	20,778	84,548
Florida	Clay Charter Academy	12,071	Not Yet Opened	Not Yet Opened
Florida	Coral Springs Charter School	4,983,533	4,525,505	683,034
Florida	Downtown Miami Charter School	649,031	537,367	312,784
Florida	Duval Charter Scholars Academy	78,053	177,750	0
Florida	Duval Charter School at Baymeadows	1,752,963	1,632,218	1,485,912
Florida	Duval Charter High School at Baymeadows	0	55,149	85,691
Florida	Duval Charter School at Flagler Center	0	Not Yet Opened	Not Yet Opened
Florida	Duval Charter School at Mandarin	271,437	819,619	Not Yet Opened
Florida	Duval Charter School at Southside	63,217	387,817	Not Yet Opened
Florida	Duval Charter School at Westside	256,648	161,600	458,075
Florida	Four Corners Charter School	1,797,560	712,379	785,870
Florida	Four Corners Charter Middle School	487,122	Not Yet Opened	Not Yet Opened
Florida	Four Corners Charter High School	487,122	Not Yet Opened	Not Yet Opened
Florida	Gateway Charter School (K-5)	1,995,969	1,547,811	1,620,777
Florida	Gateway Intermediate Charter School (6-8)	1,126,332	1,475,225	1,493,332
Florida	Gateway Charter High School (9-12)	34,851	43,909	5,169
Florida	Governors Charter Academy	33,500	139,752	329,686
Florida	Henderson Hammock Charter School	1,547,304	1,304,093	623,613
Florida	Hollywood Academy of Arts & Science	2,123,521	1,283,390	907,710
Florida	Hollywood Academy of Arts & Science Middle	19,391	419,501	208,398
Florida	Keys Gate Charter School	8,062,568	7,390,900	6,934,432
Florida	Keys Gate Charter High School	558,957	1,007,128	745,008
Florida	Manatee Charter School	0	103,483	0
Florida	North Broward Academy of Excellence	14,148	37,795	0
Florida	North Broward Academy of Excellence Middle	1,038,988	914,278	774,885
Florida	PM Wells Charter Academy	1,892,332	1,358,339	954,282
Florida	Renaissance Charter School at Central Palm	151	93,367	Not Yet Opened
Florida	Renaissance Charter School at Chickasaw Trail	1,321,168	1,190,918	621,485
Florida	Renaissance Charter School at Cooper City	797,011	386,036	269,937
Florida	Renaissance Charter School at Coral Springs	1,811,557	1,451,058	1,311,529
Florida	Renaissance Charter School at Crown Point	Not Yet Opened	Not Yet Opened	Not Yet Opened
Florida	Renaissance Charter School at Hunter's Creek	1,134,338	653,289	0
Florida	Renaissance Charter School at Cypress	9,317	954,569	Not Yet Opened
Florida	Renaissance Charter School at Goldenrod	625,789	Not Yet Opened	Not Yet Opened
Florida	Renaissance Charter School at Palms West	25,278	113,544	0
Florida	Renaissance Charter Schools at Pines	11,701	137,842	Not Yet Opened
Florida	Renaissance Charter School at Plantation	786,779	683,692	507,514
Florida	Renaissance Charter School at Poinciana	1,552,693	843,367	590,589
Florida	Renaissance Charter School at Summit	144,230	263,662	453,053
Florida	Renaissance Charter School at Tapestry	572,093	Not Yet Opened	Not Yet Opened
Florida	Renaissance Charter School at Tradition	0	126,580	68,866
Florida	Renaissance Charter School at University	1,790,655	1,648,239	724,225
Florida	Renaissance Charter School at Wellington	78	100,877	Not Yet Opened
Florida	Renaissance Charter School at West Palm Beach	653,830	421,582	164,427
Florida	Renaissance Charter School at St. Lucie	1,755,269	1,516,061	1,427,596
Florida	Renaissance Elementary Charter School at Doral	2,163,261	1,955,508	1,779,684
Florida	Renaissance Middle Charter School at Doral	222,350	373,151	269,340
Florida	Six Mile Charter Academy	404,284	442,528	671,507

CSUSA Network Fund Balances

State	School			
Florida	SouthShore Charter Academy	Not Yet Opened	Not Yet Opened	Not Yet Opened
Florida	Winthrop Charter School	2,063,946	2,755,737	2,414,665
Florida	Woodmont Charter School	0	188,064	164,079
Georgia	Cherokee Charter Academy	1,419,808	1,616,225	372,882
Georgia	Coweta Charter Academy	875,808	2,252,090	6,438
Illinois	Lloyd Bond Charter School[1]	See Note 1	See Note 1	See Note 1
Illinois	Longwood Charter School[1]	See Note 1	See Note 1	See Note 1
Illinois	Loomis Primary Charter School[1]	See Note 1	See Note 1	See Note 1
Indiana	Emma Donnan Elementary School	(1,411)	Not Yet Opened	Not Yet Opened
Indiana	Emma Donnan Middle School	(5,418)	0	0
Indiana	Emmerich Manual High School	(20,276)	0	0
Indiana	Thomas Carr Howe Community High School	(13,448)	0	0
Louisiana	Acadiana Renaissance Charter Academy	677,230	1,023,443	Not Yet Opened
Louisiana	Iberville Charter Academy	228,317	26,963	Not Yet Opened
Louisiana	Lafayette Renaissance Charter Academy	237,239	242,022	Not Yet Opened
Louisiana	Lake Charles Charter Academy	2,485,429	3,361,310	1,596,407
Louisiana	Lake Charles College Prep	(889,377)	0	Not Yet Opened
Louisiana	Magnolia School of Excellence	1,099,422	830,614	354,043
Louisiana	South Baton Rouge Charter Academy	58,978	51,792	Not Yet Opened
Louisiana	Southwest Louisiana Charter Academy	901,973	4,784,505	34,009
Cabarrus	Cabarrus Charter Academy	344,379	248,801	0
Cabarrus	Cabarrus Charter Academy Upper School	Not Yet Opened	Not Yet Opened	Not Yet Opened
North Carolina	Cardinal Charter Academy	314,915	160,944	Not Yet Opened
North Carolina	Iredell Charter Academy	Not Yet Opened	Not Yet Opened	Not Yet Opened
North Carolina	Kannapolis Charter Academy	Not Yet Opened	Not Yet Opened	Not Yet Opened
North Carolina	Langtree Charter Academy	568,059	336,893	0
North Carolina	Langtree Charter Academy Upper School	Not Yet Opened	Not Yet Opened	Not Yet Opened
North Carolina	Union Preparatory Academy at Indian Trail	Not Yet Opened	Not Yet Opened	Not Yet Opened

Notes:

[1] These schools are not individual charter schools with individual fund balances. These four schools are part of a group of 18 schools that exist under one singe charter contract. The audited fund balance is reported as one consolidated fund balance for the group of 18 schools. A financial audit is not performed for each individual school; the audit is performed on the group of 18 schools.

Wise Insurance Agency
103 W Pennsylvania Ave
Bessemer City, NC 28016

September 22, 2018

Re: Achieving Excellence Academy of Charlotte Charter School

To Whom it May Concern:

We have prepared an insurance estimate for Achieving Excellence Academy of Charlotte Charter School.

Educators Legal Liability / Management Liability which includes Directors & Officers Liability Educators Legal Liability of $1,000,000 per claim.

Commercial General Liability: Liability insurance limits of $1,000,000 each occurrence / $2,000,000 aggregate as requested. Medical Payment $15,000 per person

Employee Dishonesty: (Fidelity Bond) Employee Dishonesty coverage - $250,000

Estimated Premium Automobile Liability: Automobile liability for a limit $1,000,000 per occurrence

Estimated Premium Workers Compensation: Workers Compensation and Employers Liability as specified by Chapter 97 of the General Status for North Carolina. Premium is based on Total Remuneration using code for School Professional Employees of $1,140,000 (subject to annual audit) $12,000 Estimated Premium. These are non-binding estimates of insurance which have been based on hypothetical exposures based on information available at this time.

All of the premiums listed above are an estimate; the insurance carriers will require a full underwriting submission to calculate the accurate premiums.

Should you have any questions or comments, please do not hesitate to give me a call.
Thank you,

Virginia Donaldson

Re: 990 Form

Attach as appendix N the IRS Form 990 if you are replicating an existing charter, converting from an existing private, or contracting with an EMO.

Presently,Achieving Excellence Academy of Charlotte Charter School is not replicating an existing charter school,converting from an existing private school or contracting with an EMO.
We are considering all options and are in talks with NC Charter SchoolUSA to learn more about their services to decide if we want to contract with them in the near future but at this time we are not in contract with any EMO's including NC charterSchoolUSA.

Achieving Excellence Academy of Charlotte Charter School is not currently in an agreement with any EMO or CMO's. We are currently only entertaining discussions with Charter School USA but have not committed to going into contract with the EMO.

SIGNATURE AND NOTARIZATION PAGE FOR THE SCHOOL

Achieving Excellence Academy of Charlotte Charter School. This 17th day of August

2018, _Dawn Tassute_ (Board Chair/ President) _Dawn Tassute_ (Signature of

Board Chair/President) Sworn to and subscribed before me this day of _August 17,_ 2018.

Notary Public My commission expires , 2020

E. Warren

_____
Official Signature of Notary Public

EMILY R. WARREN
NOTARY
PUBLIC
NC
My Commission Expires
August 5, 2020
CUMBERLAND COUNTY,