

# Focus and Coherence

Leadership I - Grades 6–8 - Day 1



# CCSS WHERE TO FOCUS KINDERGARTEN MATHEMATICS



This document shows where students and teachers should spend the large majority of their time in order to meet the expectations of the Standards.

Not all content in a given grade is emphasized equally in the Standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time that they take to master, and/or their importance to future mathematics or the demands of college and career readiness. More time in these areas is also necessary for students to meet the Standards for Mathematical Practice.

To say that some things have greater emphasis is not to say that anything in the Standards can safely be neglected in instruction. Neglecting material will leave gaps in student skill and understanding and may leave students unprepared for the challenges of a later grade.

Students should spend the large majority<sup>1</sup> of their time on the major work of the grade (■). Supporting work (□) and, where appropriate, additional work (○) can engage students in the major work of the grade.<sup>2,3</sup>

## MAJOR, SUPPORTING, AND ADDITIONAL CLUSTERS FOR KINDERGARTEN

Emphases are given at the cluster level. Refer to the Common Core State Standards for Mathematics for the specific standards that fall within each cluster.

Key: ■ Major Clusters    □ Supporting Clusters    ○ Additional Clusters

- K.CC.A ■ Know number names and the count sequence.
- K.CC.B ■ Count to tell the number of objects.
- K.CC.C ■ Compare numbers.
- K.OA.A ■ Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.
- K.NBT.A ■ Work with numbers 11–19 to gain foundations for place value.
- K.MD.A ○ Describe and compare measurable attributes.
- K.MD.B □ Classify objects and count the number of objects in categories.
- K.G.A ○ Identify and describe shapes.
- K.G.B □ Analyze, compare, create, and compose shapes.

## HIGHLIGHTS OF MAJOR WORK IN GRADES K–8

K–2	Addition and subtraction – concepts, skills, and problem solving; place value
3–5	Multiplication and division of whole numbers and fractions – concepts, skills, and problem solving
6	Ratios and proportional relationships; early expressions and equations
7	Ratios and proportional relationships; arithmetic of rational numbers
8	Linear algebra and linear functions

## REQUIRED FLUENCIES FOR KINDERGARTEN

K.OA.A.5	Add/subtract within 5
----------	-----------------------

<sup>1</sup> At least 65% and up to approximately 85% of class time, with Grades K–2 nearer the upper end of that range, should be devoted to the major work of the grade. For more information, see Criterion #1 of the K–8 Publishers' Criteria for the Common Core State Standards for Mathematics [www.achievethecore.org/publisherscriteria](http://www.achievethecore.org/publisherscriteria).

<sup>2</sup> Refer also to criterion #3 in the K–8 Publishers' Criteria for the Common Core State Standards for Mathematics [www.achievethecore.org/publisherscriteria](http://www.achievethecore.org/publisherscriteria).

<sup>3</sup> Note, the critical areas are a survey of what will be taught at each grade level; the major work is the subset of topics that deserve the large majority of instructional time during a given year to best prepare students for college and careers.

# CCSS WHERE TO FOCUS GRADE 1 MATHEMATICS



MATHEMATICS



GRADE 1



FOCUS

This document shows where students and teachers should spend the large majority of their time in order to meet the expectations of the Standards.

Not all content in a given grade is emphasized equally in the Standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time that they take to master, and/or their importance to future mathematics or the demands of college and career readiness. More time in these areas is also necessary for students to meet the Standards for Mathematical Practice.

To say that some things have greater emphasis is not to say that anything in the Standards can safely be neglected in instruction. Neglecting material will leave gaps in student skill and understanding and may leave students unprepared for the challenges of a later grade.

Students should spend the large majority<sup>1</sup> of their time on the major work of the grade (■). Supporting work (□) and, where appropriate, additional work (○) can engage students in the major work of the grade.<sup>2,3</sup>

## MAJOR, SUPPORTING, AND ADDITIONAL CLUSTERS FOR GRADE 1

Emphases are given at the cluster level. Refer to the Common Core State Standards for Mathematics for the specific standards that fall within each cluster.

Key: ■ Major Clusters    □ Supporting Clusters    ○ Additional Clusters

- 1.OA.A ■ Represent and solve problems involving addition and subtraction.
- 1.OA.B ■ Understand and apply properties of operations and the relationship between addition and subtraction.
- 1.OA.C ■ Add and subtract within 20.
- 1.OA.D ■ Work with addition and subtraction equations.
- 1.NBT.A ■ Extending the counting sequence.
- 1.NBT.B ■ Understand place value.
- 1.NBT.C ■ Use place value understanding and properties of operations to add and subtract.
- 1.MD.A ■ Measure lengths indirectly and by iterating length units.
- 1.MD.B ○ Tell and write time.
- 1.MD.C □ Represent and interpret data.
- 1.G.A ○ Reason with shapes and their attributes.

## HIGHLIGHTS OF MAJOR WORK IN GRADES K–8

K–2	Addition and subtraction – concepts, skills, and problem solving; place value
3–5	Multiplication and division of whole numbers and fractions – concepts, skills, and problem solving
6	Ratios and proportional relationships; early expressions and equations
7	Ratios and proportional relationships; arithmetic of rational numbers
8	Linear algebra and linear functions

## REQUIRED FLUENCIES FOR GRADE 1

1.OA.C.6	Add/subtract within 10
----------	------------------------

<sup>1</sup> At least 65% and up to approximately 85% of class time, with Grades K–2 nearer the upper end of that range, should be devoted to the major work of the grade. For more information, see Criterion #1 of the K–8 Publishers' Criteria for the Common Core State Standards for Mathematics [www.achievethecore.org/publisherscriteria](http://www.achievethecore.org/publisherscriteria).

<sup>2</sup> Refer also to criterion #3 in the K–8 Publishers' Criteria for the Common Core State Standards for Mathematics [www.achievethecore.org/publisherscriteria](http://www.achievethecore.org/publisherscriteria).

<sup>3</sup> Note, the critical areas are a survey of what will be taught at each grade level; the major work is the subset of topics that deserve the large majority of instructional time during a given year to best prepare students for college and careers.

# CCSS WHERE TO FOCUS GRADE 2 MATHEMATICS



MATHEMATICS



GRADE 2



FOCUS

This document shows where students and teachers should spend the large majority of their time in order to meet the expectations of the Standards.

Not all content in a given grade is emphasized equally in the Standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time that they take to master, and/or their importance to future mathematics or the demands of college and career readiness. More time in these areas is also necessary for students to meet the Standards for Mathematical Practice.

To say that some things have greater emphasis is not to say that anything in the Standards can safely be neglected in instruction. Neglecting material will leave gaps in student skill and understanding and may leave students unprepared for the challenges of a later grade.

Students should spend the large majority<sup>1</sup> of their time on the major work of the grade (■). Supporting work (□) and, where appropriate, additional work (○) can engage students in the major work of the grade.<sup>2,3</sup>

## MAJOR, SUPPORTING, AND ADDITIONAL CLUSTERS FOR GRADE 2

Emphases are given at the cluster level. Refer to the Common Core State Standards for Mathematics for the specific standards that fall within each cluster.

Key: ■ Major Clusters   □ Supporting Clusters   ○ Additional Clusters

- 2.OA.A ■ Represent and solve problems involving addition and subtraction.
- 2.OA.B ■ Add and subtract within 20.
- 2.OA.C □ Work with equal groups of objects to gain foundations for multiplication.
- 2.NBT.A ■ Understand place value.
- 2.NBT.B ■ Use place value understanding and properties of operations to add and subtract.
- 2.MD.A ■ Measure and estimate lengths in standard units.
- 2.MD.B ■ Relate addition and subtraction to length.
- 2.MD.C □ Work with time and money.
- 2.MD.D □ Represent and interpret data.
- 2.G.A ○ Reason with shapes and their attributes.

## HIGHLIGHTS OF MAJOR WORK IN GRADES K–8

K–2	Addition and subtraction – concepts, skills, and problem solving; place value
3–5	Multiplication and division of whole numbers and fractions – concepts, skills, and problem solving
6	Ratios and proportional relationships; early expressions and equations
7	Ratios and proportional relationships; arithmetic of rational numbers
8	Linear algebra and linear functions

## REQUIRED FLUENCIES FOR GRADE 2

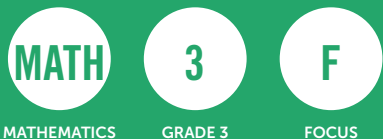
2.OA.B.2	Single-digit sums and differences (sums from memory by end of Grade 2)
2.NBT.B.5	Add/subtract within 100

<sup>1</sup> At least 65% and up to approximately 85% of class time, with Grades K–2 nearer the upper end of that range, should be devoted to the major work of the grade. For more information, see Criterion #1 of the K–8 Publishers' Criteria for the Common Core State Standards for Mathematics [www.achievethecore.org/publisherscriteria](http://www.achievethecore.org/publisherscriteria).

<sup>2</sup> Refer also to criterion #3 in the K–8 Publishers' Criteria for the Common Core State Standards for Mathematics [www.achievethecore.org/publisherscriteria](http://www.achievethecore.org/publisherscriteria).

<sup>3</sup> Note, the critical areas are a survey of what will be taught at each grade level; the major work is the subset of topics that deserve the large majority of instructional time during a given year to best prepare students for college and careers.

# CCSS WHERE TO FOCUS GRADE 3 MATHEMATICS



This document shows where students and teachers should spend the large majority of their time in order to meet the expectations of the Standards.

Not all content in a given grade is emphasized equally in the Standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time that they take to master, and/or their importance to future mathematics or the demands of college and career readiness. More time in these areas is also necessary for students to meet the Standards for Mathematical Practice.

To say that some things have greater emphasis is not to say that anything in the Standards can safely be neglected in instruction. Neglecting material will leave gaps in student skill and understanding and may leave students unprepared for the challenges of a later grade.

Students should spend the large majority<sup>1</sup> of their time on the major work of the grade (■). Supporting work (□) and, where appropriate, additional work (●) can engage students in the major work of the grade.<sup>2,3</sup>

## MAJOR, SUPPORTING, AND ADDITIONAL CLUSTERS FOR GRADE 3

Emphases are given at the cluster level. Refer to the Common Core State Standards for Mathematics for the specific standards that fall within each cluster.

Key: ■ Major Clusters    □ Supporting Clusters    ● Additional Clusters

- 3.OA.A ■ Represent and solve problems involving multiplication and division.
- 3.OA.B ■ Understand properties of multiplication and the relationship between multiplication and division.
- 3.OA.C ■ Multiply and divide within 100.
- 3.OA.D ■ Solve problems involving the four operations, and identify and explain patterns in arithmetic.
- 3.NBT.A ● Use place value understanding and properties of operations to perform multi-digit arithmetic.
- 3.NF.A ■ Develop understanding of fractions as numbers.
- 3.MD.A ■ Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.
- 3.MD.B □ Represent and interpret data.
- 3.MD.C ■ Geometric measurement: understand concepts of area and relate area to multiplication and to addition.
- 3.MD.D ● Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.
- 3.G.A □ Reason with shapes and their attributes.

## HIGHLIGHTS OF MAJOR WORK IN GRADES K–8

K–2	Addition and subtraction – concepts, skills, and problem solving; place value
3–5	Multiplication and division of whole numbers and fractions – concepts, skills, and problem solving
6	Ratios and proportional relationships; early expressions and equations
7	Ratios and proportional relationships; arithmetic of rational numbers
8	Linear algebra and linear functions

## REQUIRED FLUENCIES FOR GRADE 3

3.OA.C.7	Single-digit products and quotients (Products from memory by end of Grade 3)
3.NBT.A.2	Add/subtract within 1000

<sup>1</sup> At least 65% and up to approximately 85% of class time, with Grades K–2 nearer the upper end of that range, should be devoted to the major work of the grade. For more information, see Criterion #1 of the K–8 Publishers' Criteria for the Common Core State Standards for Mathematics [www.achievethecore.org/publisherscriteria](http://www.achievethecore.org/publisherscriteria).

<sup>2</sup> Refer also to criterion #3 in the K–8 Publishers' Criteria for the Common Core State Standards for Mathematics [www.achievethecore.org/publisherscriteria](http://www.achievethecore.org/publisherscriteria).

<sup>3</sup> Note, the critical areas are a survey of what will be taught at each grade level; the major work is the subset of topics that deserve the large majority of instructional time during a given year to best prepare students for college and careers.

# CCSS WHERE TO FOCUS GRADE 4 MATHEMATICS



MATHEMATICS



GRADE 4



FOCUS

This document shows where students and teachers should spend the large majority of their time in order to meet the expectations of the Standards.

Not all content in a given grade is emphasized equally in the Standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time that they take to master, and/or their importance to future mathematics or the demands of college and career readiness. More time in these areas is also necessary for students to meet the Standards for Mathematical Practice.

To say that some things have greater emphasis is not to say that anything in the Standards can safely be neglected in instruction. Neglecting material will leave gaps in student skill and understanding and may leave students unprepared for the challenges of a later grade.

Students should spend the large majority<sup>1</sup> of their time on the major work of the grade (■). Supporting work (□) and, where appropriate, additional work (○) can engage students in the major work of the grade.<sup>2,3</sup>

## MAJOR, SUPPORTING, AND ADDITIONAL CLUSTERS FOR GRADE 4

Emphases are given at the cluster level. Refer to the Common Core State Standards for Mathematics for the specific standards that fall within each cluster.

Key: ■ Major Clusters    □ Supporting Clusters    ○ Additional Clusters

- 4.OA.A ■ Use the four operations with whole numbers to solve problems.
- 4.OA.B □ Gain familiarity with factors and multiples.
- 4.OA.C ○ Generate and analyze patterns.
- 4.NBT.A ■ Generalize place value understanding for multi-digit whole numbers.
- 4.NBT.B ■ Use place value understanding and properties of operations to perform multi-digit arithmetic.
- 4.NF.A ■ Extend understanding of fraction equivalence and ordering.
- 4.NF.B ■ Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
- 4.NF.C ■ Understand decimal notation for fractions, and compare decimal fractions.
- 4.MD.A □ Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
- 4.MD.B □ Represent and interpret data.
- 4.MD.C ○ Geometric measurement: understand concepts of angle and measure angles.
- 4.G.A ○ Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

## HIGHLIGHTS OF MAJOR WORK IN GRADES K–8

K–2	Addition and subtraction – concepts, skills, and problem solving; place value
3–5	Multiplication and division of whole numbers and fractions – concepts, skills, and problem solving
6	Ratios and proportional relationships; early expressions and equations
7	Ratios and proportional relationships; arithmetic of rational numbers
8	Linear algebra and linear functions

## REQUIRED FLUENCIES FOR GRADE 4

4.NBT.B.4	Add/subtract within 1,000,000
-----------	-------------------------------

<sup>1</sup> At least 65% and up to approximately 85% of class time, with Grades K–2 nearer the upper end of that range, should be devoted to the major work of the grade. For more information, see Criterion #1 of the K–8 Publishers' Criteria for the Common Core State Standards for Mathematics [www.achievethecore.org/publisherscriteria](http://www.achievethecore.org/publisherscriteria).

<sup>2</sup> Refer also to criterion #3 in the K–8 Publishers' Criteria for the Common Core State Standards for Mathematics [www.achievethecore.org/publisherscriteria](http://www.achievethecore.org/publisherscriteria).

<sup>3</sup> Note, the critical areas are a survey of what will be taught at each grade level; the major work is the subset of topics that deserve the large majority of instructional time during a given year to best prepare students for college and careers.

# CCSS WHERE TO FOCUS GRADE 5 MATHEMATICS



MATHEMATICS



GRADE 5



FOCUS

This document shows where students and teachers should spend the large majority of their time in order to meet the expectations of the Standards.

Not all content in a given grade is emphasized equally in the Standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time that they take to master, and/or their importance to future mathematics or the demands of college and career readiness. More time in these areas is also necessary for students to meet the Standards for Mathematical Practice.

To say that some things have greater emphasis is not to say that anything in the Standards can safely be neglected in instruction. Neglecting material will leave gaps in student skill and understanding and may leave students unprepared for the challenges of a later grade.

Students should spend the large majority<sup>1</sup> of their time on the major work of the grade (■). Supporting work (□) and, where appropriate, additional work (○) can engage students in the major work of the grade.<sup>2,3</sup>

## MAJOR, SUPPORTING, AND ADDITIONAL CLUSTERS FOR GRADE 5

Emphases are given at the cluster level. Refer to the Common Core State Standards for Mathematics for the specific standards that fall within each cluster.

Key: ■ Major Clusters    □ Supporting Clusters    ○ Additional Clusters

- 5.OA.A ○ Write and interpret numerical expressions.
- 5.OA.B ○ Analyze patterns and relationships.
- 5.NBT.A ■ Understand the place value system.
- 5.NBT.B ■ Perform operations with multi-digit whole numbers and with decimals to hundredths.
- 5.NF.A ■ Use equivalent fractions as a strategy to add and subtract fractions.
- 5.NF.B ■ Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
- 5.MD.A □ Convert like measurement units within a given measurement system.
- 5.MD.B □ Represent and interpret data.
- 5.MD.C ■ Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.
- 5.G.A ○ Graph points on the coordinate plane to solve real-world and mathematical problems.
- 5.G.B ○ Classify two-dimensional figures into categories based on their properties.

## HIGHLIGHTS OF MAJOR WORK IN GRADES K–8

K–2	Addition and subtraction – concepts, skills, and problem solving; place value
3–5	Multiplication and division of whole numbers and fractions – concepts, skills, and problem solving
6	Ratios and proportional relationships; early expressions and equations
7	Ratios and proportional relationships; arithmetic of rational numbers
8	Linear algebra and linear functions

## REQUIRED FLUENCIES FOR GRADE 5

5.NBT.B.5	Multi-digit multiplication
-----------	----------------------------

<sup>1</sup> At least 65% and up to approximately 85% of class time, with Grades K–2 nearer the upper end of that range, should be devoted to the major work of the grade. For more information, see Criterion #1 of the K–8 Publishers' Criteria for the Common Core State Standards for Mathematics [www.achievethecore.org/publisherscriteria](http://www.achievethecore.org/publisherscriteria).

<sup>2</sup> Refer also to criterion #3 in the K–8 Publishers' Criteria for the Common Core State Standards for Mathematics [www.achievethecore.org/publisherscriteria](http://www.achievethecore.org/publisherscriteria).

<sup>3</sup> Note, the critical areas are a survey of what will be taught at each grade level; the major work is the subset of topics that deserve the large majority of instructional time during a given year to best prepare students for college and careers.



# CCSS WHERE TO FOCUS GRADE 6 MATHEMATICS



MATHEMATICS



GRADE 6



FOCUS

This document shows where students and teachers should spend the large majority of their time in order to meet the expectations of the Standards.

Not all content in a given grade is emphasized equally in the Standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time that they take to master, and/or their importance to future mathematics or the demands of college and career readiness. More time in these areas is also necessary for students to meet the Standards for Mathematical Practice.

To say that some things have greater emphasis is not to say that anything in the Standards can safely be neglected in instruction. Neglecting material will leave gaps in student skill and understanding and may leave students unprepared for the challenges of a later grade.

Students should spend the large majority<sup>1</sup> of their time on the major work of the grade (■). Supporting work (□) and, where appropriate, additional work (○) can engage students in the major work of the grade.<sup>2,3</sup>

## MAJOR, SUPPORTING, AND ADDITIONAL CLUSTERS FOR GRADE 6

Emphases are given at the cluster level. Refer to the Common Core State Standards for Mathematics for the specific standards that fall within each cluster.

Key: ■ Major Clusters   □ Supporting Clusters   ○ Additional Clusters

- 6.RP.A | ■ Understand ratio concepts and use ratio reasoning to solve problems.
- 6.NS.A | ■ Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
- 6.NS.B | ○ Compute fluently with multi-digit numbers and find common factors and multiples.
- 6.NS.C | ■ Apply and extend previous understandings of numbers to the system of rational numbers.
- 6.EE.A | ■ Apply and extend previous understandings of arithmetic to algebraic expressions.
- 6.EE.B | ■ Reason about and solve one-variable equations and inequalities.
- 6.EE.C | ■ Represent and analyze quantitative relationships between dependent and independent variables.
- 6.G.A | □ Solve real-world and mathematical problems involving area, surface area, and volume.
- 6.SP.A | ○ Develop understanding of statistical variability.
- 6.SP.B | ○ Summarize and describe distributions.

## HIGHLIGHTS OF MAJOR WORK IN GRADES K–8

K–2	Addition and subtraction – concepts, skills, and problem solving; place value
3–5	Multiplication and division of whole numbers and fractions – concepts, skills, and problem solving
6	Ratios and proportional relationships; early expressions and equations
7	Ratios and proportional relationships; arithmetic of rational numbers
8	Linear algebra and linear functions

## REQUIRED FLUENCIES FOR GRADE 6

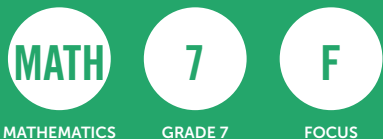
6.NS.B.2	Multi-digit division
6.NS.B.3	Multi-digit decimal operations

<sup>1</sup> At least 65% and up to approximately 85% of class time, with Grades K–2 nearer the upper end of that range, should be devoted to the major work of the grade. For more information, see Criterion #1 of the K–8 Publishers' Criteria for the Common Core State Standards for Mathematics [www.achievethecore.org/publisherscriteria](http://www.achievethecore.org/publisherscriteria).

<sup>2</sup> Refer also to criterion #3 in the K–8 Publishers' Criteria for the Common Core State Standards for Mathematics [www.achievethecore.org/publisherscriteria](http://www.achievethecore.org/publisherscriteria).

<sup>3</sup> Note, the critical areas are a survey of what will be taught at each grade level; the major work is the subset of topics that deserve the large majority of instructional time during a given year to best prepare students for college and careers.

# CCSS WHERE TO FOCUS GRADE 7 MATHEMATICS



This document shows where students and teachers should spend the large majority of their time in order to meet the expectations of the Standards.

Not all content in a given grade is emphasized equally in the Standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time that they take to master, and/or their importance to future mathematics or the demands of college and career readiness. More time in these areas is also necessary for students to meet the Standards for Mathematical Practice.

To say that some things have greater emphasis is not to say that anything in the Standards can safely be neglected in instruction. Neglecting material will leave gaps in student skill and understanding and may leave students unprepared for the challenges of a later grade.

Students should spend the large majority<sup>1</sup> of their time on the major work of the grade (■). Supporting work (□) and, where appropriate, additional work (○) can engage students in the major work of the grade.<sup>2,3</sup>

## MAJOR, SUPPORTING, AND ADDITIONAL CLUSTERS FOR GRADE 7

Emphases are given at the cluster level. Refer to the Common Core State Standards for Mathematics for the specific standards that fall within each cluster.

Key: ■ Major Clusters    □ Supporting Clusters    ○ Additional Clusters

- 7.RP.A | ■ Analyze proportional relationships and use them to solve real-world and mathematical problems.
- 7.NS.A | ■ Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
- 7.EE.A | ■ Use properties of operations to generate equivalent expressions.
- 7.EE.B | ■ Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
- 7.G.A | ○ Draw, construct and describe geometrical figures and describe the relationships between them.
- 7.G.B | ○ Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.
- 7.SP.A | □ Use random sampling to draw inferences about a population.
- 7.SP.B | ○ Draw informal comparative inferences about two populations.
- 7.SP.C | □ Investigate chance processes and develop, use, and evaluate probability models.

## HIGHLIGHTS OF MAJOR WORK IN GRADES K–8

K–2	Addition and subtraction – concepts, skills, and problem solving; place value
3–5	Multiplication and division of whole numbers and fractions – concepts, skills, and problem solving
6	Ratios and proportional relationships; early expressions and equations
7	Ratios and proportional relationships; arithmetic of rational numbers
8	Linear algebra and linear functions

<sup>1</sup> At least 65% and up to approximately 85% of class time, with Grades K–2 nearer the upper end of that range, should be devoted to the major work of the grade. For more information, see Criterion #1 of the K–8 Publishers' Criteria for the Common Core State Standards for Mathematics [www.achievethecore.org/publisherscriteria](http://www.achievethecore.org/publisherscriteria).

<sup>2</sup> Refer also to criterion #3 in the K–8 Publishers' Criteria for the Common Core State Standards for Mathematics [www.achievethecore.org/publisherscriteria](http://www.achievethecore.org/publisherscriteria).

<sup>3</sup> Note, the critical areas are a survey of what will be taught at each grade level; the major work is the subset of topics that deserve the large majority of instructional time during a given year to best prepare students for college and careers.

# CCSS WHERE TO FOCUS GRADE 8 MATHEMATICS



MATHEMATICS



GRADE 8



FOCUS

This document shows where students and teachers should spend the large majority of their time in order to meet the expectations of the Standards.

Not all content in a given grade is emphasized equally in the Standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time that they take to master, and/or their importance to future mathematics or the demands of college and career readiness. More time in these areas is also necessary for students to meet the Standards for Mathematical Practice.

To say that some things have greater emphasis is not to say that anything in the Standards can safely be neglected in instruction. Neglecting material will leave gaps in student skill and understanding and may leave students unprepared for the challenges of a later grade.

Students should spend the large majority<sup>1</sup> of their time on the major work of the grade (■). Supporting work (□) and, where appropriate, additional work (○) can engage students in the major work of the grade.<sup>2,3</sup>

## MAJOR, SUPPORTING, AND ADDITIONAL CLUSTERS FOR GRADE 8

Emphases are given at the cluster level. Refer to the Common Core State Standards for Mathematics for the specific standards that fall within each cluster.

Key: ■ Major Clusters   □ Supporting Clusters   ○ Additional Clusters

- 8.NS.A | □ Know that there are numbers that are not rational, and approximate them by rational numbers.
- 8.EE.A | ■ Work with radicals and integer exponents.
- 8.EE.B | ■ Understand the connections between proportional relationships, lines, and linear equations.
- 8.EE.C | ■ Analyze and solve linear equations and pairs of simultaneous linear equations.
- 8.F.A | ■ Define, evaluate, and compare functions.
- 8.F.B | ■ Use functions to model relationships between quantities.
- 8.G.A | ■ Understand congruence and similarity using physical models, transparencies, or geometry software.
- 8.G.B | ■ Understand and apply the Pythagorean Theorem.
- 8.G.C | ○ Solve real-world and mathematical problems involving volume of cylinders, cones and spheres.
- 8.SPA | □ Investigate patterns of association in bivariate data.

## HIGHLIGHTS OF MAJOR WORK IN GRADES K–8

K–2	Addition and subtraction – concepts, skills, and problem solving; place value
3–5	Multiplication and division of whole numbers and fractions – concepts, skills, and problem solving
6	Ratios and proportional relationships; early expressions and equations
7	Ratios and proportional relationships; arithmetic of rational numbers
8	Linear algebra and linear functions

<sup>1</sup> At least 65% and up to approximately 85% of class time, with Grades K–2 nearer the upper end of that range, should be devoted to the major work of the grade. For more information, see Criterion #1 of the K–8 Publishers' Criteria for the Common Core State Standards for Mathematics [www.achievethecore.org/publisherscriteria](http://www.achievethecore.org/publisherscriteria).

<sup>2</sup> Refer also to criterion #3 in the K–8 Publishers' Criteria for the Common Core State Standards for Mathematics [www.achievethecore.org/publisherscriteria](http://www.achievethecore.org/publisherscriteria).

<sup>3</sup> Note, the critical areas are a survey of what will be taught at each grade level; the major work is the subset of topics that deserve the large majority of instructional time during a given year to best prepare students for college and careers.

# CCSS WHERE TO FOCUS GRADES K–8 MATHEMATICS

An important subset of the major work in grades K–8 is the progression that leads toward middle school algebra.

K	1	2	3	4	5	6	7	8
Know number names and the count sequence	Represent and solve problems involving addition and subtraction	Represent and solve problems involving addition and subtraction	Represent & solve problems involving multiplication and division	Use the four operations with whole numbers to solve problems	Understand the place value system	Apply and extend previous understandings of multiplication and division to divide fractions by fractions	Apply and extend previous understanding of operations with fractions to add, subtract, multiply, and divide rational numbers	Work with radical and integer exponents
Count to tell the number of objects	Understand and apply properties of operations and the relationship between addition and subtraction	Add and subtract within 20	Understand properties of multiplication and the relationship between multiplication and division	Generalize place value understanding for multi-digit whole numbers	Perform operations with multi-digit whole numbers and decimals to hundredths	Apply and extend previous understandings of numbers to the system of rational numbers	Analyze proportional relationships and use them to solve real-world and mathematical problems	Understand the connections between proportional relationships, lines, and linear equations**
Compare numbers	Add and subtract within 20	Understand place value	Multiply & divide within 100	Use place value understanding and properties of operations to perform multidigit arithmetic	Use equivalent fractions as a strategy to add and subtract fractions	Understand ratio concepts and use ratio reasoning to solve problems	Use properties of operations to generate equivalent expressions	Analyze and solve linear equations and pairs of simultaneous linear equations
Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from	Work with addition and subtraction equations	Measure and estimate lengths in standard units	Solve problems involving the four operations, and identify & explain patterns in arithmetic	Extend understanding of fraction equivalence and ordering	Apply and extend previous understandings of multiplication and division to multiply and divide fractions	Apply and extend previous understandings of arithmetic to algebraic expressions	Solve real-life and mathematical problems using numerical and algebraic expressions and equations	Define, evaluate, and compare functions
Work with numbers 11–19 to gain foundations for place value	Extend the counting sequence	Relate addition and subtraction to length	Develop understanding of fractions as numbers	Build fractions from unit fractions by applying and extending previous understandings of operations	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition	Reason about and solve one-variable equations and inequalities		Use functions to model relationships between quantities
	Understand place value		Solve problems involving measurement and estimation of intervals of time, liquid volumes, & masses of objects	Understand decimal notation for fractions, and compare decimal fractions	Graph points in the coordinate plane to solve real-world and mathematical problems*	Represent and analyze quantitative relationships between dependent and independent variables		
	Use place value understanding and properties of operations to add and subtract		Geometric measurement: understand concepts of area and relate area to multiplication and to addition					
	Measure lengths indirectly and by iterating length units							

\* Indicates a cluster that is well thought of as a part of a student's progress to algebra, but that is currently not designated as major by the assessment consortia in their draft materials. Apart from the one asterisked exception, the clusters listed here are a subset of those designated as major in the assessment consortia's draft documents.

\*\* Depends on similarity ideas from geometry to show that slope can be defined and then used to show that a linear equation has a graph which is a straight line and conversely.

---

# Observing for Standards and Shifts

## An Observation Protocol for Instructional Video

### Step One Before Viewing the Lesson

Team calibrates understanding of intended standards and match to instruction by answering the questions, “What should we see if teacher was addressing the standard correctly?”

### Step Two – While Viewing the Lesson

Observe and capture evidence about what the teacher is saying and doing—script teacher directions and explanations; notice anchor charts, whiteboard/chalkboard lesson descriptions and directions, etc.

Observe and capture evidence about what the students are saying and doing. Make note of points of struggle or developing misconceptions. Pay close attention to the students who are not actively participating.

### Step Three – Post Observation Debrief

Begin with the standard(s). As a team, calibrate about what standard(s) were observed. Use the Mastery Connect app to look them up and confirm.

Recreate the student learning experience. Begin with what observers saw first, second, third, etc. Make sure all comments are evidenced-based.

*First video only:  
Spend the first couple of minutes discussing general impressions, pedagogy, and classroom management. While important aspects of teacher effectiveness, these observations are not the purpose of the observation. This activity is necessary though: it helps create space for the next phase of the debrief.*

### Step Three – Drawing Conclusions

Begin to draw conclusions from the observation by discussing the following:

- What standard(s) were being attempted? Were those the intended standard(s)? If not, to what grade and standard is the task aligned?
- What are the knowledge and skills required to be successful on this task?
- Were the following a good match to the intended standard(s):
  - Instruction given by the teacher?
  - Standards knowledge of the teacher?
  - Content knowledge of the teacher?
  - Student materials and tasks?

### Step Four – Make a Plan for Providing Feedback



# Content Coaching: Unbound

## A Tool to Deepen Understanding of Standards, Shifts and Content

So what do you do when you see that students aren't "getting it"? These content-specific questions are intended to be used by teachers, leaders and coaches for job-embedded development of Math and ELA content knowledge, post-lesson debriefing, coaching and lesson planning. The questions should be used to probe and push the thinking behind instructional practices, and to guide informed and actionable decisions on the changes needed for students to engage in grade-level, standards-aligned learning.

This tool is to be used in conjunction with the Instructional Practice Guide suite of tools from Student Achievement Partners. The [Instructional Practice Guides](#) are an important first step for diagnosing where and when Common Core instruction is taking place. Because every Core Action and every Shift cannot be observable in every lesson, [Beyond the Lesson Discussion Guides](#) offer questions for teachers and coaches to consider in order to ensure effective CCSS implementation over the course of the year. *Content Coaching: UnboundEd* provides an even more granular layer of instructional analysis and recommended next steps focused on application of content related to standards in the classroom.

## MATH

Shift	Questions that Develop Understanding of Math Standards, Shifts and Content	
<b>Leading the Conversation:</b>		
<ul style="list-style-type: none"> <li>• What are the knowledge and skills required to be successful on this task?</li> <li>• To what grade and standard is the task aligned?</li> </ul>		
<b>Focus</b>	<p><b>If not grade-level standards:</b></p> <ul style="list-style-type: none"> <li>• Why was instruction not addressing grade-level standards?</li> <li>• What data or other work supports the decision to teach non-grade-level standards?</li> <li>• Is this part of the major work of that grade?</li> </ul> <p><b>If not major work of the grade:</b></p> <ul style="list-style-type: none"> <li>• How will this chosen standard authentically lead students back to working with math content that is emphasized in this grade?</li> <li>• How does this task connect to the major work in the grades above and below?</li> </ul>	
<b>Coherence</b>	<p><b>Across Grade Coherence</b></p> <ul style="list-style-type: none"> <li>• Does the instruction carefully connect learning across grades so that students can build new understanding onto foundations</li> </ul>	<p><b>Within Grade Coherence</b></p> <ul style="list-style-type: none"> <li>• Is the instruction leveraging how the standards within a grade were built to reinforce a major topic by utilizing supporting,</li> </ul>

	<p>built in previous years?</p> <ul style="list-style-type: none"> <li>• Are the students who get it making connections to previous learning?</li> <li>• For students who are not getting it, is the teacher leading students to make connections to previous learning?</li> <li>• What prerequisite knowledge is a student lacking to be able to make those connections?</li> </ul> <p><b>If students are still not making connections:</b></p> <ul style="list-style-type: none"> <li>• Ask: What prerequisite knowledge is a student lacking to be able to make those connections?</li> <li>• Consider: share time studying the wiring diagram, studying linking standards, with next steps being digging into curriculum for additional lessons on knowledge gaps.</li> </ul>	<p>complementary topics?</p> <ul style="list-style-type: none"> <li>• Are the non-major work standards being taught supporting priority content?</li> <li>• If supporting standards are not linking to major work of the grade: What do the standards say?</li> <li>• How can this chosen standard authentically lead students back to working with math content that is to be emphasized in this grade?</li> </ul> <p><b>If supporting standards are not linking to major work of the grade:</b></p> <ul style="list-style-type: none"> <li>• What do the standards say?</li> <li>• Same question as before: How can this chosen standard authentically lead students back to working with math content that is to be emphasized in this grade?</li> </ul>	
<p><b>Rigor</b></p>	<p><b>Procedural Skill and Fluency</b></p> <p><b>If fluency opportunities are not present:</b></p> <ul style="list-style-type: none"> <li>• Where is/will fluency practice be built in upcoming lessons?</li> </ul> <p><b>If students show fluency as a limiter in their math work:</b></p> <ul style="list-style-type: none"> <li>• How will students' lack of fluency be addressed?</li> <li>• Consider curriculum: fluency activities from high-quality lessons for the area that is limiting students</li> </ul>	<p><b>Conceptual Understanding</b></p> <p><b>If conceptual understanding opportunities are not present:</b></p> <ul style="list-style-type: none"> <li>• How can more opportunities be worked into what the students are thinking when working with math concepts?</li> </ul> <p><b>If students show conceptual understanding as a limiter in their math work:</b></p> <ul style="list-style-type: none"> <li>• Consider gaps: re-ask questions in Coherence activities</li> <li>• Consider curriculum: study</li> </ul>	<p><b>Modeling/Application</b></p> <p><b>If application opportunities are not present:</b></p> <ul style="list-style-type: none"> <li>• How can more application opportunities be folded into the student math experience?</li> </ul> <p><b>If students are provided external prompts to complete application problems:</b></p> <ul style="list-style-type: none"> <li>• How can the teacher adapt opportunities so that students can apply math they know without the prompting?</li> <li>• Consider</li> </ul>



		high-quality lessons aligned to the standard of Focus	curriculum: study high-quality tasks aligned to the standard of Focus
Want more from UnboundEd? Check out our <a href="#">Math Content Guides: Unbound</a> and other resources to help enhance instruction.			

## ELA

Shift	Questions that Develop Understanding of ELA Standards, Shifts and Content
	<p><b>Leading the Conversation:</b></p> <ul style="list-style-type: none"> <li>• What are the knowledge and skills required to be successful on this task?</li> <li>• To what grade and standard is the task aligned?</li> <li>• How are texts selected for units/lessons? How are texts selected for a sequence across the school year? How are texts selected for independent/guided reading?</li> <li>• (FOR P-3 ONLY) Is there a systematic phonics program as part of the literacy block?</li> <li>• (FOR SECONDARY ONLY) Is there collaboration between ELA and other content-area teachers around coherently building knowledge and sharing responsibility for students' literacy development and improvement?</li> </ul>
<b>Regular practice with complex text and its academic language</b>	<ul style="list-style-type: none"> <li>• Is a grade-level complex text at the center of instruction?</li> <li>• IF NOT – is the focus of the lesson to build knowledge and vocabulary related to a high-leverage topic?</li> <li>• IF NOT – are there opportunities for students to engage in rich evidence-based conversations about complex texts and topics that were experienced in previous lessons or via independent/group work?</li> <li>• IF NOT – is the focus of the instructional time to build fluency, a volume of reading and/or stamina? Or is the focus on small-group instruction with homogenous groups by reading level?</li> </ul> <p style="text-align: center;">**If the above is true, WHEN and HOW OFTEN do students experience complex text at the center of instruction?</p> <ul style="list-style-type: none"> <li>• Are students engaging in regular practice with complex texts and academic language?</li> <li>• Does instruction focus on students reading grade-level complex texts closely, discerning deep meaning?</li> <li>• Do questions and tasks address the text and help build knowledge by attending to its particular structures, concepts, ideas, and details?</li> <li>• Does instruction focus on building students' academic vocabulary in context throughout instruction?</li> </ul>

	<ul style="list-style-type: none"> <li>Do questions and tasks attend to the words, phrases, and sentences within the text?</li> </ul>
<p><b>Reading, writing, and speaking grounded in evidence from text, both literary and informational</b></p>	<ul style="list-style-type: none"> <li>Are students' reading, writing, and/or speaking grounded in evidence from text?</li> <li>Are text-dependent questions sending students back into the text to answer them? Are they connected to the intended standard(s) of the lesson?</li> <li>If NOT – In cases where the teacher is asking questions that can be answered from students' personal experience, is this happening AFTER and IN ADDITION TO text-based analysis?</li> <li>Are lessons and tasks designed so that students cite specific evidence from text(s) to support analysis, inferences, and claims, both orally and in writing?</li> <li>Are students using evidence to build on each other's observations or insights during discussion or collaboration?</li> <li>Does the teacher expect evidence and precision from students and probe responses accordingly?</li> </ul>
<p><b>Intentionally building knowledge through content-rich nonfiction</b></p>	<ul style="list-style-type: none"> <li>Do questions and tasks address the text and help build knowledge by attending to its particular concepts, ideas, and details?</li> <li>Do students read a significant amount of nonfiction?</li> <li>When the anchor text of a unit is fiction, is nonfiction used to supplement the text and help build understanding and knowledge about historical periods, topics and issues explored in the fiction text?</li> <li>Is instruction designed so that nonfiction is systematically used to build domain-specific knowledge and vocabulary on topics?</li> </ul>
<p>Want more from UnboundEd? Check out our <a href="#">ELA Content Guides: Unbound</a> and other resources to help enhance instruction.</p>	