This document shows where students and teachers should spend the large majority of their time to meet the expectations of the Standards. This work was based on triangulating major content from the publishers guide to CCSS HS mathematics with identified content within Smarter Balanced Claim 1 (Concepts and Procedures), and Claims 2, 3, & 4 (Problem Solving, Communication, and Modeling).

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 course.

Students should have opportunities to engage in the major work of the domain (■) within multiple high school courses at an appropriate level of difficulty. Important work of the domain (□) should be included in the first two years of a high school course sequence as much as possible, and where appropriate, supporting work (○) and additional work (○) can engage students in the major and important work of high school standards.

### Major, Important, Supporting, and Additional Clusters for High School Functions

Emphasis 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
- □ Important Clusters
- ○ Supporting Clusters
- ○ Additional Clusters
- (+) Advanced Content

<table>
<thead>
<tr>
<th>The Real Number System (N-RN)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N.RN.A</td>
<td>■ Extend the properties of exponents to rational exponents.</td>
</tr>
<tr>
<td>N.RN.B</td>
<td>□ Use properties of rational and irrational numbers.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quantities (N-Q)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N.Q.A</td>
<td>■ Reason quantitatively and use units to solve problems.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The Complex Number System (N-CN)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N.CN.A</td>
<td>○ Perform arithmetic operations with complex numbers.</td>
</tr>
<tr>
<td>N.CN.B</td>
<td>(+) Represent complex numbers and their operations on the complex plane.</td>
</tr>
<tr>
<td>N.CN.C</td>
<td>(+) Use complex numbers in polynomial identities and equations.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vector and Matrix Quantities (N-VM)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N.VM.A</td>
<td>(+) Represent and model with vector quantities.</td>
</tr>
<tr>
<td>N.VM.B</td>
<td>(+) Perform operations on vectors.</td>
</tr>
<tr>
<td>N.VM.C</td>
<td>(+) Perform operations on matrices and use matrices in applications</td>
</tr>
</tbody>
</table>

This document format is based on the K-8 version developed by Student Achievement Partners. High School major clusters were developed by analysis conducted by the Oregon Department of Education based on the High School Publisher’s Criteria for Mathematics and Smarter Balanced Content Specifications. Final results of this analysis does not necessarily indicate the endorsement of Student Achievement Partners.
This document shows where students and teachers should spend the large majority of their time to meet the expectations of the Standards. This work was based on triangulating major content from the publishers guide to CCSS HS mathematics with identified content within Smarter Balanced Claim 1 (Concepts and Procedures), and Claims 2, 3, & 4 (Problem Solving, Communication, and Modeling).

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 course.

Students should have opportunities to engage in the major work of the domain (■) within multiple high school courses at an appropriate level of difficulty. Important work of the domain (□) should be included in the first two years of a high school course sequence as much as possible, and where appropriate, supporting work (○) and additional work (●) can engage students in the major and important work of high school standards.

### MAJOR, IMPORTANT, SUPPORTING, AND ADDITIONAL CLUSTERS FOR HIGH SCHOOL ALGEBRA

Emphasis 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  □ Important Clusters  ○ Supporting Clusters  ● Additional Clusters

#### Seeing Structure in Equations (A-SSE)

A.SSE.A  ■ Interpret the structure of expressions.
A.SSE.B  ■ Write expressions in equivalent forms to solve problems.

#### Arithmetic with Polynomials and Rational Expressions (A-APR)

A.APR.A  ■ Perform arithmetic operations on polynomials.
A.APR.B  □ Understand the relationship between zeros and factors of polynomials.
A.APR.C  ○ Use polynomial identities to solve problems.
A.APR.D  ○ Rewrite rational expressions.

#### Creating Equations (A-CED)

A.CED.A  ■ Create equations that describe numbers or relationships.

#### Reasoning with Equations and Inequalities (A-REI)

A.REI.A  ■ Understand solving equations as a process of reasoning and explain the reasoning.
A.REI.B  ■ Solve equations and inequalities in one variable.
A.REI.C  □ Solve systems of equations.
A.REI.D  ○ Represent and solve equations and inequalities graphically.

---

**Applying Key Takeaways from Grades 6–8**

Solving problems at a level of sophistication appropriate to high school by:

- Applying ratios and proportional relationships.
- Applying percentages and unit conversions, e.g., in the context of complicated measurement problems involving quantities with derived or compound units (such as mg/mL, kg/m³, acre-feet, etc.).
- Applying basic function concepts, e.g., by interpreting the features of a graph in the context of an applied problem.
- Applying concepts and skills of geometric measurement e.g., when analyzing a diagram or schematic.
- Applying concepts and skills of basic statistics and probability (see 6-8.SP)
- Performing rational number arithmetic fluently

---

This document format is based on the K-8 version developed by Student Achievement Partners. High School major clusters were developed by analysis conducted by the Oregon Department of Education based on the High School Publisher’s Criteria for Mathematics and Smarter Balanced Content Specifications. Final results of this analysis do not necessarily indicate the endorsement of Student Achievement Partners.
This document shows where students and teachers should spend the large majority of their time to meet the expectations of the Standards. This work was based on triangulating major content from the publishers guide to CCSS HS mathematics with identified content within Smarter Balanced Claim 1 (Concepts and Procedures), and Claims 2, 3, & 4 (Problem Solving, Communication, and Modeling).

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 course.

Students should have opportunities to engage in the major work of the domain (●) within multiple high school courses at an appropriate level of difficulty. Important work of the domain (□) should be included in the first two years of a high school course sequence as much as possible, and where appropriate, supporting work (○) and additional work (●) can engage students in the major and important work of high school standards.

**MAJOR, IMPORTANT, SUPPORTING, AND ADDITIONAL CLUSTERS FOR HIGH SCHOOL FUNCTIONS**

Emphasis 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  □ Important Clusters  ● Supporting Clusters  ○ Additional Clusters

### Interpreting Functions (F-IF)

- **F.IF.A**  □ Understand the concept of a function and use function notation.
- **F.IF.B**  □ Interpret functions that arise in applications in terms of the context.
- **F.IF.C**  ● Analyze functions using different representations.

### Building Functions (F-BF)

- **F.BF.A**  □ Perform arithmetic operations on polynomials.
- **F.BF.B**  ● Understand the relationship between zeros and factors of polynomials.

### Linear, Quadratic, and Exponential Models (F-LE)

- **F.LE.A**  □ Construct and compare linear, quadratic, and exponential models and solve problems.
- **F.LE.B**  ● Interpret expressions for functions in terms of the situation they model.

### Trigonometric Functions (F-TF)

- **F.TF.A**  ● Extend the domain of trigonometric functions using the unit circle.
- **F.TF.B**  ● Model periodic phenomena with trigonometric functions.
- **F.TF.C**  ● Prove and apply trigonometric identities.

**Applying Key Takeaways from Grades 6–8**

Solving problems at a level of sophistication appropriate to high school by:

- Applying ratios and proportional relationships.
- Applying percentages and unit conversions, e.g., in the context of complicated measurement problems involving quantities with derived or compound units (such as mg/mL, kg/m³, acre-feet, etc.).
- Applying basic function concepts, e.g., by interpreting the features of a graph in the context of an applied problem.
- Applying concepts and skills of geometric measurement e.g., when analyzing a diagram or schematic.
- Applying concepts and skills of basic statistics and probability (see 6-8.SP)
- Performing rational number arithmetic fluently

This document format is based on the K-8 version developed by Student Achievement Partners. High School major clusters were developed by analysis conducted by the Oregon Department of Education based on the High School Publisher’s Criteria for Mathematics and Smarter Balanced Content Specifications. Final results of this analysis does not necessarily indicate the endorsement of Student Achievement Partners.
This document shows where students and teachers should spend the large majority of their time to meet the expectations of the Standards. This work was based on triangulating major content from the publishers guide to CCSS HS mathematics with identified content within Smarter Balanced Claim 1 (Concepts and Procedures), and Claims 2, 3, & 4 (Problem Solving, Communication, and Modeling).

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 course.

Students should have opportunities to engage in the major work of the domain (■) within multiple high school courses at an appropriate level of difficulty. Important work of the domain (□) should be included in the first two years of a high school course sequence as much as possible, and where appropriate, supporting work (○) and additional work (●) can engage students in the major and important work of high school standards.

### MAJOR, IMPORTANT, SUPPORTING, AND ADDITIONAL CLUSTERS FOR HIGH SCHOOL GEOMETRY

Emphasis are given at the cluster level. Refer to the Common Core State Standards for Mathematics for the specific standards within a cluster.

**Key:** ■Major Clusters  □ Important Clusters  ○ Supporting Clusters  ● Additional Clusters (+)Advanced Content

#### Congruence (G-CO)
- **G.CO.A**  □ Experiment with transformation in the plane.
- **G.CO.B**  □ Understand congruence in terms of rigid motions.
- **G.CO.C**  □ Prove geometric theorems.
- **G.CO.D**  ○ Make geometric constructions.

#### Similarity, Right Triangles, and Trigonometry (G-SRT)
- **G.SRT.A**  □ Understand similarity in terms of similarity transformations.
- **G.SRT.B**  □ Prove theorems involving similarity.
- **G.SRT.C**  □ Define trigonometric ratios and solve problems involving right triangles.
- **G.SRT.D**  ○ (+) Apply trigonometry to general triangles.

#### Circles (G-C)
- **G.C.A**  ○ Understand and apply theorems about circles
- **G.C.B**  ○ Find arc lengths and areas of sectors of circles.

#### Expressing Geometric Properties with Equations (G-GPE)
- **G.GPE.A**  ○ Translate between the geometric description and the equation for a conic section.
- **G.GPE.B**  ○ Use coordinates to prove simple geometric theorems algebraically.

#### Geometric Measurement and Dimension (G-GMD)
- **G.GMD.A**  ○ Explain volume formulas and use them to solve problems.
- **G.GMD.B**  ○ Visualize relationships between two-dimensional and three-dimensional objects.

#### Modeling with Geometry (G-MG)
- **G.MG.A**  ○ Apply geometric concepts in modeling situations.

---

Applying Key Takeaways from Grades 6–8

Solving problems at a level of sophistication appropriate to high school by:

- Applying ratios and proportional relationships.
- Applying percentages and unit conversions, e.g., in the context of complicated measurement problems involving quantities with derived or compound units (such as mg/mL, kg/m3, acre-feet, etc.).
- Applying basic function concepts, e.g., by interpreting the features of a graph in the context of an applied problem.
- Applying concepts and skills of geometric measurement, e.g., when analyzing a diagram or schematic.
- Applying concepts and skills of basic statistics and probability (see 6-8.SP)
- Performing rational number arithmetic fluently
This document shows where students and teachers should spend the large majority of their time to meet the expectations of the Standards. This work was based on triangulating major content from the publishers guide to CCSS HS mathematics with identified content within Smarter Balanced Claim 1 (Concepts and Procedures), and Claims 2, 3, & 4 (Problem Solving, Communication, and Modeling).

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 course.

Students should have opportunities to engage in the major work of the domain (●) within multiple high school courses at an appropriate level of difficulty. Important work of the domain (□) should be included in the first two years of a high school course sequence as much as possible, and where appropriate, supporting work (●) and additional work (○) can engage students in the major and important work of high school standards.

### Major, Important, Supporting, and Additional Clusters for High School Functions

Emphasis 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 □ Important Clusters ○ Supporting Clusters ★ Additional Clusters (+) Advanced Content

#### Interpreting Categorical and Quantitative Data (S-ID)

- **S.ID.A** Summarize, represent, and interpret data on a single count or measurement variable.
- **S.ID.B** Summarize represent and interpret data on two categorical and quantitative variables.
- **S.ID.C** Interpret linear models.

#### Making Inferences and Justifying Conclusions (S-IC)

- **S.IC.A** Understand and evaluate random processes underlying statistical experiments.
- **S.IC.B** Make inferences and justify conclusions from sample surveys, experiments and observational studies.

#### Conditional Probability and the Rules of Probability (S-CP)

- **S.CP.A** Understand independence and conditional probability and use them to interpret data.
- **S.CP.B** Use the rules of probability to compute probabilities of compound events in a uniform probability model.

#### Using Probability to Make Decisions (S-MD)

- **S.MD.A** (+) Calculate expected values and use them to solve problems.
- **S.MD.B** (+) Use probability to evaluate outcomes of decisions.

---

This document format is based on the K-8 version developed by Student Achievement Partners. High School major clusters were developed by analysis conducted by the Oregon Department of Education based on the High School Publisher’s Criteria for Mathematics and Smarter Balanced Content Specifications. Final results of this analysis does not necessarily indicate the endorsement of Student Achievement Partners.