



# Essential Content Framework

## A Beginning-of-Year Success Plan for Educators

*HMH Geometry*, copyright 2015, 2018

As schools enter the 2020–2021 academic year, educators will be challenged with meeting students’ needs for the current school year while addressing learning gaps produced as a result of COVID-19 related school closures from the previous school year.

Working with the International Center for Leadership in Education (ICLE), HMH has identified the highest-priority standards for you to focus on. These priority standards are built from hundreds of projects with thousands of educators around the country, which consistently show that prioritizing standards results in learning gains for ALL students, particularly students who are behind, and regardless of whether they have experienced disrupted learning.

Using these priority standards, HMH has developed this Essential Content Framework as a guidance document that supplements the planning resources and tools. The Framework allows educators to focus on those standards most critical to a student’s success in achieving grade-level proficiency and above and providing specific content from prior learning that can be used for scaffolding and reteaching.

Use this Essential Content Framework in conjunction with your school or district’s scope-and-sequence documentation to identify critical skills, on-level lessons, and expected prior learning that support the priority standards.

### Determine Student Needs


Get to know what skill strengths and challenges your students are bringing to the classroom at the beginning of the year.

- Consult data or feedback from the last academic year. Reach out to the previous grade’s teachers to find out whether they have any advice that you should consider as you start the year.

- The *Assessment Resources* ancillary for Geometry includes a Placement Test that is correlated to Grade 8 standards and allows you to create an Individual Student Profile showing what students know at the start of the school year.
- As you begin each module in Geometry, use the **Are You Ready?** quiz to diagnose students' preparedness for the module. The quiz focuses on prerequisite skills for the module, and students who need help with those skills can get it through the *Response to Intervention* ancillary, which includes Tier 1, Tier 2, and Tier 3 interventions.

## Response to Intervention



UNIT 1 TRANSFORMATIONS AND CONGRUENCE						
Student Edition Lessons	Tier 1 Skills	Pre-Tests	Tier 2 Skills Strategic Intervention	Post-Tests	Tier 3 Skills Intensive Intervention	
<b>Module 1 Tools of Geometry</b>						
1.1 Segment Length and Midpoints	Reteach 1-1	Module 1	1 Algebraic Representations of Transformations 2 Angle Relationships 9 Distance and Midpoint Formulas	Skill 1	 Building Block (Tier 3) worksheets are available online for students who need additional support on prerequisite skills. See the teacher page of each Tier 2 Skill lesson for a list of Building Block skills.	
1.2 Angle Measures and Angle Bisectors	Reteach 1-2			Skill 2		
1.3 Representing and Describing Transformations	Reteach 1-3			Skill 9		
1.4 Reasoning and Proof	Reteach 1-4					
<b>Module 2 Transformations and Symmetry</b>						
2.1 Translations	Reteach 2-1	Module 2	17 Properties of Reflections 18 Properties of Rotations 19 Properties of Translations	Skill 17		
2.2 Reflections	Reteach 2-2			Skill 18		
2.3 Rotations	Reteach 2-3			Skill 19		
2.4 Investigating Symmetry	Reteach 2-4					
<b>Module 3 Congruent Figures</b>						
3.1 Sequences of Transformations	Reteach 3-1	Module 3	7 Congruent Figures 17 Properties of Reflections 18 Properties of Rotations 19 Properties of Translations	Skill 7		
3.2 Proving Figures are Congruent Using Rigid Motions	Reteach 3-2			Skill 17		
3.3 Corresponding Parts of Congruent Figures Are Congruent	Reteach 3-3			Skill 18		

- You can use the Personal Math Trainer on my.hrw.com to administer the **Are You Ready?** quizzes and other assessments.

**Personal Math Trainer** **Mod 1 Tools of Geometry - Are You Ready?**

Navigation: 1 2 3 4 5 6 7 8 9 10

Question **Print All** **Standards**

Transform the equation.  
 Shift  $y = 5x - 8$  units up.  
 The transformed equation is  .

- Throughout the course, you can use the Personal Math Trainer to give homework assignments that include learning aids such as feedback, worked-out examples, step-by-step interactive solutions, access to a PDF of the textbook, and Math on the Spot videos.
- Special types of homework assignments available with the Personal Math Trainer provide personalized intervention that is delivered either before or after the assignments.

**Please choose an assignment type:**

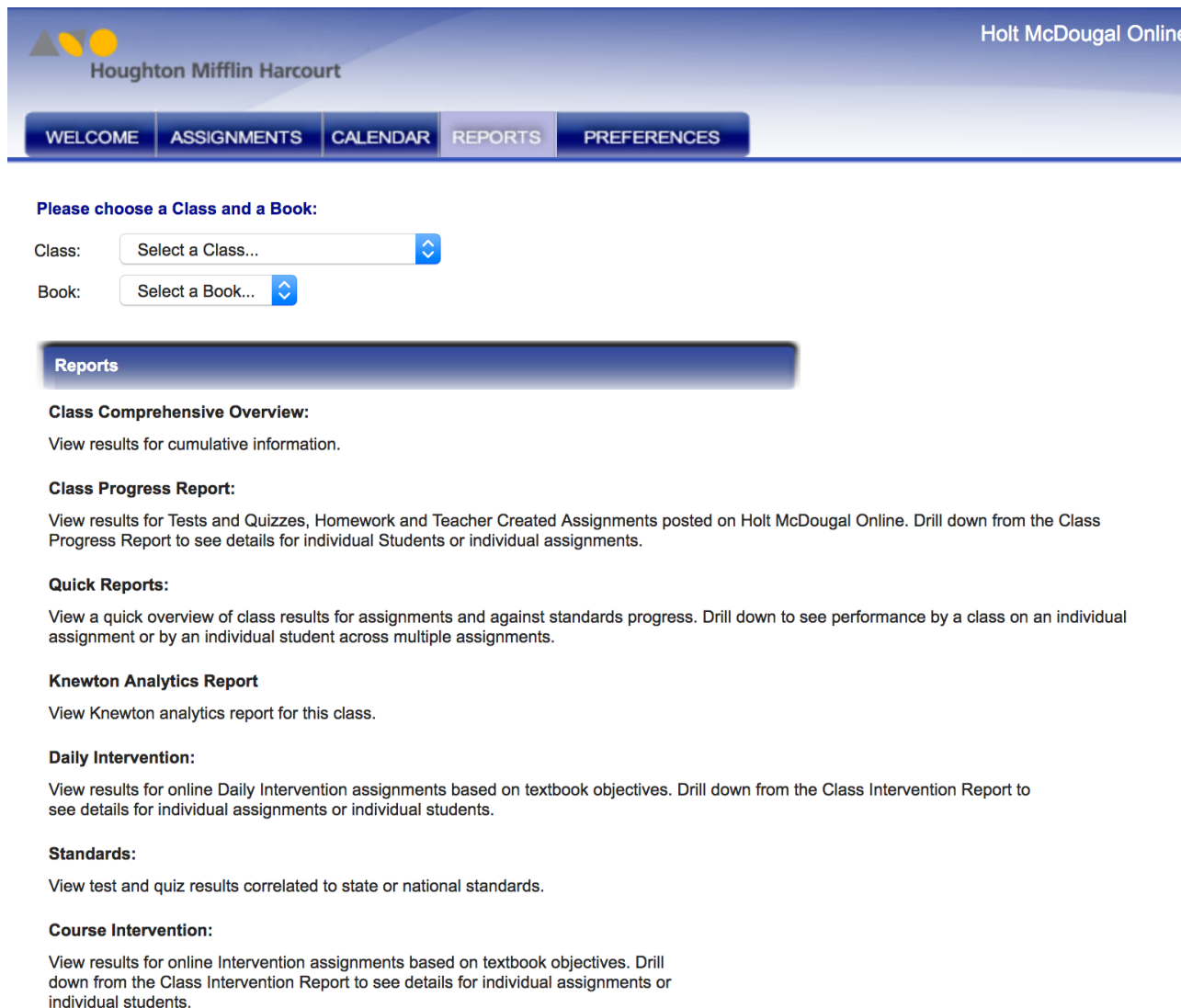
Category:  Daily Intervention  
 Standard-Based Intervention  
 Course Intervention  
 Tests and Quizzes  
 Homework

Grade:

Show details

**Submit**  
**Create**

- When students use the Personal Math Trainer, you can generate a variety of reports of student performance.



**Houghton Mifflin Harcourt** Holt McDougal Online

WELCOME ASSIGNMENTS CALENDAR **REPORTS** PREFERENCES

Please choose a Class and a Book:

Class: Select a Class...

Book: Select a Book...

**Reports**

**Class Comprehensive Overview:**  
View results for cumulative information.

**Class Progress Report:**  
View results for Tests and Quizzes, Homework and Teacher Created Assignments posted on Holt McDougal Online. Drill down from the Class Progress Report to see details for individual Students or individual assignments.

**Quick Reports:**  
View a quick overview of class results for assignments and against standards progress. Drill down to see performance by a class on an individual assignment or by an individual student across multiple assignments.

**Knewton Analytics Report**  
View Knewton analytics report for this class.

**Daily Intervention:**  
View results for online Daily Intervention assignments based on textbook objectives. Drill down from the Class Intervention Report to see details for individual assignments or individual students.

**Standards:**  
View test and quiz results correlated to state or national standards.

**Course Intervention:**  
View results for online Intervention assignments based on textbook objectives. Drill down from the Class Intervention Report to see details for individual assignments or individual students.

## Focus on the Priority Standards

Organized in a way to supplement the Pacing Guides found at the beginning of each unit in the Geometry Teacher Edition, this Essential Content Framework is intended to provide instructional plans and access to interventions that will allow for students' learning gaps to be addressed throughout the school year.

- Starting on the next page is a list of the HMH Priority Standards for Geometry. The lessons in *HMH Geometry* that address each standard are also listed. Note that Module 14 does not address any HMH Priority Standards. You should consider your own school's or district's scope and sequence for a Geometry course to decide whether and when to teach that module.
- When you teach a lesson, you can use the formative assessment built into the lesson to gauge student understanding of the lesson's concepts and skills. The formative assessment includes Reflect questions and Your Turn problems after each Explore and Explain section in the lesson as well as the Elaborate questions after the last Explain section.
- The *Differentiated Instruction* ancillary provides leveled practice that allows you to tailor homework to the needs of your students. Each lesson ends with a Lesson Performance Task that takes students beyond routine practice and provides an opportunity for them to work collaboratively.
- If students encounter difficulties mastering the Priority Standards, it may be due to inadequate prior learning of prerequisite concepts and skills. The list of Priority Standards starting on the next page identifies one or more prerequisite standards for each Priority Standard as well as earlier lessons within the *Go Math!* series that address the prerequisite standards. You may want to revisit those earlier lessons to help students succeed with the current lesson. One way to do this is to use the Reteach worksheets for the lessons that address prerequisite standards.
  - For high school lessons, the Reteach worksheets can be found in the *Response to Intervention* ancillaries.
  - For middle school lessons, the Reteach worksheets can be found in the *Differentiated Instruction* ancillaries.

## Geometry Priority Standards and Prerequisite Standards

Priority Standards for Geometry (An asterisk denotes a modeling standard.)	Geometry Lessons that Address the Priority Standards	Prerequisite Middle School or High School Standards for the Geometry Priority Standards	Go Math Lessons or Modules that Address the Prerequisite Standards
<p>Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.</p>	<p>1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 11.2, 11.3</p>	<p>Verify experimentally the properties of rotations, reflections, and translations:</p> <ul style="list-style-type: none"> <li>• Lines are taken to lines, and line segments to line segments of the same length.</li> <li>• Angles are taken to angles of the same measure.</li> <li>• Parallel lines are taken to parallel lines.</li> </ul>	<p><b>Go Math, Grade 8:</b>            Lesson 9.1: Properties of Translations            Lesson 9.2: Properties of Reflections            Lesson 9.3: Properties of Rotations</p>
<p>Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.</p>	<p>1.3, 2.1, 2.2, 2.3, 3.1, 3.2</p>	<p>Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.</p>	<p><b>Go Math, Grade 8:</b>            Lesson 9.5: Congruent Figures</p>

Priority Standards for Geometry (An asterisk denotes a modeling standard.)	Geometry Lessons that Address the Priority Standards	Prerequisite Middle School or High School Standards for the Geometry Priority Standards	Go Math Lessons or Modules that Address the Prerequisite Standards
<p><b>G.CO.11</b> Prove theorems about parallelograms. <i>Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.</i></p>	<p>9.1, 9.2, 9.3, 9.4, 10.4</p>	<p>Prove theorems about triangles. <i>Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.</i></p> <p>Prove theorems about lines and angles. <i>Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.</i></p>	<p><b>Geometry:</b></p> <p>Lesson 2.2: Use Inductive and Deductive Reasoning</p> <p>Lesson 2.3: Write Proofs about Segments</p> <p>Lesson 2.4: Write Proofs about Angles</p> <p>Module 3: Lines and Transversals</p> <p>Module 9: Properties of Triangles</p> <p>Module 10: Triangle Inequalities</p>

Priority Standards for Geometry (An asterisk denotes a modeling standard.)	Geometry Lessons that Address the Priority Standards	Prerequisite Middle School or High School Standards for the Geometry Priority Standards	Go Math Lessons or Modules that Address the Prerequisite Standards
<p>Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).  <i>Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.</i></p>	<p>1.1, 1.2, 2.2, 4.3, 4.4, 5.2, 5.3, 6.1, 6.2, 6.3, 7.2, 8.1, 8.2, 8.3, 8.4, 9.1, 9.5, 11.4, 12.1, 12.2, 13.2, 15.2, 15.3, 15.4, 15.5, 17.2</p>	<p>Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.</p>	<p><b>Go Math, Grade 7:</b>          Lesson 8.2: Geometric Drawings</p>
<p>Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.</p>	<p>11.2, 11.3</p>	<p>Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.</p>	<p><b>Go Math, Grade 8:</b>          Lesson 10.3: Similar Figures</p>



Priority Standards for Geometry (An asterisk denotes a modeling standard.)	Geometry Lessons that Address the Course Priority Standards	Prerequisite Middle School or High School Standards for the Geometry Priority Standards	Go Math Lessons or Modules that Address the Prerequisite Standards
<p>Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.</p>	<p>5.2, 5.3, 5.4, 6.1, 6.2, 6.3, 7.3, 8.2, 9.1, 9.2, 9.3, 9.4, 9.5, 11.4, 12.1, 12.3, 12.4, 13.2, 13.3, 15.4</p>	<p>Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. <i>For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.</i></p> <p>Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.</p>	<p><b>Go Math, Grade 8:</b>        Module 11: Angle Relationships in Parallel Lines and Triangles</p> <p><b>Go Math, Grade 7:</b>        Lesson 8.1: Similar Shapes and Scale Drawings</p>

Priority Standards for Geometry (An asterisk denotes a modeling standard.)	Geometry Lessons that Address the Priority Standards	Prerequisite Middle School or High School Standards for the Geometry Priority Standards	Go Math Lessons or Modules that Address the Prerequisite Standards
Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.*	13.1, 13.2, 13.3, 13.4	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	<b>Go Math, Grade 8:</b> Lesson 12.1: The Pythagorean Theorem
Identify and describe relationships among inscribed angles, radii, and chords. <i>Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.</i>	15.1, 15.3, 15.4, 15.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	<b>Geometry:</b> Module 5: Triangle Congruence Criteria Module 6: Applications of Triangle Congruence Module 11: Similarity and Transformations Module 12: Using Similar Triangles
Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.	16.2, 16.3	Prove that all circles are similar.  Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	<b>Geometry:</b> Lesson 11.2: Proving Figures are Similar Using Transformations <b>Go Math, Grade 7:</b> Lesson 9.1: Circumference Lesson 9.2: Area of Circles

Priority Standards for Geometry (An asterisk denotes a modeling standard.)	Geometry Lessons that Address the Priority Standards	Prerequisite Middle School or High School Standards for the Geometry Priority Standards	Go Math Lessons or Modules that Address the Prerequisite Standards
<p>Use coordinates to prove simple geometric theorems algebraically. <i>For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point <math>(1, \sqrt{3})</math> lies on the circle centered at the origin and containing the point <math>(0, 2)</math>.</i></p>	<p>1.1, 8.1, 8.3, 8.4, 10.1, 10.2, 10.3, 10.4, 17.1</p>	<p>Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.</p> <p>Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.</p>	<p><b>Go Math, Grade 8:</b>          Lesson 12.3: Distance Between Two Points</p> <p><b>Go Math, Grade 6:</b>          Module 14: Distance and Area in the Coordinate Plane</p>
<p>Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.*</p>	<p>10.3, 10.5, 11.1, 13.4, 20.1</p>	<p>Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.</p> <p>Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.</p>	<p><b>Go Math, Grade 8:</b>          Lesson 12.3: Distance Between Two Points</p> <p><b>Go Math, Grade 6:</b>          Module 13: Area of Polygons</p>

Priority Standards for Geometry (An asterisk denotes a modeling standard.)	Geometry Lessons that Address the Priority Standards	Prerequisite Middle School or High School Standards for the Geometry Priority Standards	Go Math Lessons or Modules that Address the Prerequisite Standards
Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*	18.1, 18.2, 18.3, 18.4, 20.1, 20.2, 20.3	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	<b>Go Math, Grade 8:</b> Module 13: Volume
Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).*	16.1, 16.2, 16.3, 17.1, 17.2, 18.1, 18.2, 18.3, 18.4, 19.2, 19.3, 19.4, 20.2, 20.3	Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.  Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.	<b>Go Math, Grade 7:</b> Lesson 9.3: Area of Composite Figures Lesson 9.4: Solving Surface Area Problems Lesson 9.5: Solving Volume Problems  <b>Go Math, Grade 6:</b> Lesson 15.1: Nets and Surface Area

<b>Priority Standards for Geometry            (An asterisk denotes a modeling standard.)</b>	<b>Geometry Lessons that Address the Priority Standards</b>	<b>Prerequisite Middle School or High School Standards for the Geometry Priority Standards</b>	<b>Go Math Lessons or Modules that Address the Prerequisite Standards</b>
<p>Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).*</p>	<p>2.2, 20.3</p>	<p>Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.</p> <p>Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.</p>	<p><b>Go Math, Grade 7:</b>            Lesson 9.3: Area of Composite Figures            Lesson 9.4: Solving Surface Area Problems            Lesson 9.5: Solving Volume Problems</p> <p><b>Go Math, Grade 6:</b>            Lesson 15.1: Nets and Surface Area</p>

<b>Priority Standards for Geometry            (An asterisk denotes a modeling standard.)</b>	<b>Geometry Lessons that Address the Priority Standards</b>	<b>Prerequisite Middle School or High School Standards for the Geometry Priority Standards</b>	<b>Go Math Lessons or Modules that Address the Prerequisite Standards</b>
<p>Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. <i>For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.*</i></p>	<p>21.4, 22.1, 22.2, 22.3, 23.2</p>	<p>Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.*</p>	<p><b>Go Math, Algebra 1:</b>            Module 8: Multi-Variable Categorical Data</p>

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<p>Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. <i>For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.*</i></p>	<p>22.1, 22.2, 22.3, 23.2</p>	<p>Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.</p> <ul style="list-style-type: none"> <li>• Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.</li> <li>• Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.</li> </ul>	<p><b>Go Math, Grade 7:</b>          Lesson 12.3: Experimental Probability of Compound Events          Lesson 13.2: Theoretical Probability of Compound Events</p>