

# INTRODUCTION

## MATHEMATICAL PRACTICES

Student Mathematical Practices	NCTM Teaching Mathematical Practices
<ol style="list-style-type: none"> <li>1. Make sense of problems and persevere in solving them.</li> <li>2. Reason abstractly and quantitatively.</li> <li>3. Construct viable arguments and critique the reasoning of others.</li> <li>4. Model with mathematics.</li> <li>5. Use appropriate tools strategically.</li> <li>6. Attend to precision.</li> <li>7. Look for and make use of structure.</li> <li>8. Look for and express regularity in repeated reasoning.</li> </ol>	<ol style="list-style-type: none"> <li>1. Establish mathematics goals to focus learning.</li> <li>2. Implement tasks that promote reasoning and problem solving.</li> <li>3. Use and connect mathematical representations.</li> <li>4. Facilitate meaningful mathematical discourse.</li> <li>5. Pose purposeful questions.</li> <li>6. Build procedural fluency from conceptual understanding.</li> <li>7. Support productive struggle in learning mathematics.</li> <li>8. Elicit and use evidence of student thinking.</li> </ol>

## LITERACY SKILLS FOR MATHEMATICAL PROFICIENCY

Communication in mathematics employs literacy skills in reading, vocabulary, speaking and listening, and writing. Mathematically proficient students communicate using precise terminology and multiple representations including graphs, tables, charts, and diagrams. By describing and contextualizing mathematics, students create arguments and support conclusions. They evaluate and critique the reasoning of others and analyze and reflect on their own thought processes. Mathematically proficient students have the capacity to engage fully with mathematics in context by posing questions, choosing appropriate problem-solving approaches, and justifying solutions.

1. Use multiple reading strategies.
2. Understand and use correct mathematical vocabulary.
3. Discuss and articulate mathematical ideas.
4. Write mathematical arguments.

## GENERAL RESOURCES

### INSTRUCTIONAL FOCUS DOCUMENTS (IFDs)

Each unit within this guide includes detailed information from the Instructional Focus Documents (IFDs) for all standards within that unit. The IFDs are state documents that include grade-level expectations and instructional guidance for each content standard within this math course.

For the complete list of IFDs for 7th grade standards, click [HERE](#)

### TEXTBOOK RESOURCES

McGraw Hill is our textbook resource

Advanced 7th Grade Pacing by Module	
Fall USC Window Aug 17-28	
Module 1: PROPORTIONAL RELATIONSHIPS	Aug 5 - Aug 28
Module 2 : SOLVE PERCENT PROBLEMS	Aug 31 - Sept 15
Modules 3 & 4: OPERATIONS WITH RATIONAL NUMBERS	Sept 16 - Oct 9
Advanced Module A: SCIENTIFIC NOTATION	Oct 19-23
Module 5: SIMPLIFY ALGEBRAIC EXPRESSIONS	Oct 26 - Nov 13
Module 6 & 7: WRITE AND SOLVE EQUATIONS & INEQUALITIES	Nov 16 - Dec 17
Benchmark 1 Nov 18-19 Modules 1-4	
Winter Usc Dec 7-17	
Module 10: PROBABILITY	Jan 6 - Jan 22
Module 11: STATISTICS	Jan 25 - Feb 15
Module 8: GEOMETRIC FIGURES	Feb 16 - March 9
Benchmark 2 March 3-4 Modules 1-7 & 10-11	
Module 9: MEASURE FIGURES	March 10 - April 9
TCAP Takeoff	April 12 - 16
TCAP April 19 - May 6	
Spring USC April 12-23	
Prep for Algebra	After TCAP - May 26

# SCOPE AND SEQUENCE

7.RPA.1	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
7.RPA.2	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
7.RPA.2a	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
7.RPA.2b	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
7.RPA.2c	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
7.RPA.2d	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
7.RPA.3	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
7.NS.A.1	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
7.NS.A.1. a	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
7.NS.A.1. b	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
7.NS.A.1. c	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
7.NS.A.2	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post

													TCAP
<b>7.NS.A.2.</b> <b>a</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>7.NS.A.2</b> <b>b</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>7.NS.A.2.</b> <b>c</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>7.NS.A.2.</b> <b>d</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>7.NS.A.3</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>7.EE.A.1</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>7.EE.A.2</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>7.EE.B.3</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>7.EE.B.3.</b> <b>a</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>7.EE.B.3.</b> <b>b</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>7.EE.B.4</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>7.EE.B.4.</b> <b>a</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>7.EE.B.4.</b> <b>b</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>7.G.A.1</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP

<b>7.G.A.2</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	<b>MOD.8</b>	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>7.G.B.3</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	<b>MOD.9</b>	MOD.10	MOD.11	Mod A	Post TCAP
<b>7.G.B.4</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	<b>MOD.8</b>	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>7.G.B.5</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	<b>MOD.9</b>	MOD.10	MOD.11	Mod A	Post TCAP
<b>7.SP.A.1</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	<b>MOD.11</b>	Mod A	Post TCAP
<b>7.SP.A.2</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	<b>MOD.11</b>	Mod A	Post TCAP
<b>7.SP.B.3</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	<b>MOD.11</b>	Mod A	Post TCAP
<b>7.SP.B.4</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	<b>MOD.11</b>	Mod A	Post TCAP
<b>7.SPC.5</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	<b>MOD.10</b>	MOD.11	Mod A	Post TCAP
<b>7.SPC.6</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	<b>MOD.10</b>	MOD.11	Mod A	Post TCAP
<b>7.SPC.6.a</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	<b>MOD.10</b>	MOD.11	Mod A	Post TCAP
<b>7.SPC.6.b</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	<b>MOD.10</b>	MOD.11	Mod A	Post TCAP
<b>7.SPC.6.c</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	<b>MOD.10</b>	MOD.11	Mod A	Post TCAP
<b>7.SPC.7</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	<b>MOD.10</b>	MOD.11	Mod A	Post TCAP
<b>7.SPC.7.a</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	<b>MOD.10</b>	MOD.11	Mod A	Post TCAP
<b>7.SPC.7.b</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	<b>MOD.10</b>	MOD.11	Mod A	Post

													TCAP
<b>7.SP.D.8</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>7.SP.D.8.a</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>7.SP.D.8.b</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>8.EE.B.5</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>8.NS.A.1</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>8.EE.A.2</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>8.EE.A.3</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>8.SP.B.4</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>8.G.C.6</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>8.G.A.2</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>8.G.A.1</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>8.G.A.1a</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>8.G.A.1b</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>8.G.A.1c</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP
<b>8.G.A.1d</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post

														TCAP
<b>8.G.B.3</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP	
<b>8.G.B.4</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP	
<b>8.G.B.5</b>	MOD.1	MOD.2	MOD.3	MOD.4	MOD.5	MOD.6	MOD.7	MOD.8	MOD.9	MOD.10	MOD.11	Mod A	Post TCAP	

\*\*Advanced 7th Grade Math will also include 8th grade standards. Please also see the 8th grade curriculum guide.

# MODULE 1 | PROPORTIONAL RELATIONSHIPS

Module 1 : Students will analyze multiple representations of proportional relationships (tables, graphs, and equations).

TN Reveal Lessons - 1.1, 1.2, 1.3, 1.4, 1.5, 1.6,

Aug 5 - Aug 28

LESSON	STANDARD	MODULE 1 INSTRUCTIONAL FOCUS		
		APPROACHING UNDERSTANDING (1-2)	GRADE-LEVEL UNDERSTANDING (3)	EXTENSIVE UNDERSTANDING (4)
1.1	<b>7.RP.A.1</b> <b>Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 15 minutes, compute the unit rate as the complex fraction (1/2) / (1/4) miles per hour, equivalently 2 miles per hour.</b>	<ul style="list-style-type: none"> <li>→ Identify a ratio as a unit rate when it is expressed in the form <math>a : 1</math> or <math>1 : a</math>.</li> <li>→ Choose a unit rate to represent a ratio presented as a complex fraction given a visual model.</li> <li>→ Choose a unit rate to model situations involving whole number quantities.</li> <li>→ Choose a unit rate to model situations involving fractional quantities presented as a non simplified complex fraction.</li> <li>→ Write ratios to model situations involving whole number quantities measured in like or different units and use the ratio to determine a unit rate.</li> </ul>	<ul style="list-style-type: none"> <li>→ Interpret a complex fraction as the division of two fractions.</li> <li>→ Calculate unit rates from a given complex fraction or ratio with like or unlike units.</li> <li>→ Write ratios to model real-world situations involving fractional quantities measured in like or different units and use the ratio to determine a unit rate.</li> </ul>	<ul style="list-style-type: none"> <li>→ Write ratios that model situations involving fractional quantities measured in like or different units, use the ratio to determine a unit rate, and explain the unit rate in terms of the context of the situation.</li> <li>→ Create contextual problems that model situations involving fractional quantities measured in like or different units and provide the unit rate solution.</li> </ul>

<p>1.2 1.3 1.4 1.5 1.6</p>	<p><b>7.R.P.A.2</b>  <b>Recognize and represent proportional relationships between quantities.</b>  <b>7.R.P.A.2a Decide whether two quantities are in a proportional relationship (e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin).</b>  <b>7.R.P.A.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</b>  <b>7.R.P.A.2c Use the concept of equality to represent proportional relationships with equations. For example, if total cost <math>t</math> is proportional to the number <math>n</math> of items purchased at a constant price <math>p</math>, the relationship between the total cost and the number of items can be expressed as: <math>t = pn</math>.</b>  <b>7.R.P.A.2d Explain what a point <math>(x, y)</math> on the graph of a proportional relationship means in terms of the situation, with special attention to the points <math>(0, 0)</math> and <math>(1, r)</math> where <math>r</math> is the unit rate.</b></p>	<ul style="list-style-type: none"> <li>→ Graph points on the coordinate plane when given a table of values.</li> <li>→ From context generate tables of equivalent ratios, find a missing number in the table, and use the table to plot the ratios on a coordinate graph.</li> <li>→ Choose the constant of proportionality (unit rate) when given a graph.</li> <li>→ Differentiate between independent and dependent variables.</li> <li>→ Know that the graph of a proportional relationship must be linear and pass through the origin</li> <li>→ Choose the constant of proportionality (unit rate) when given a table.</li> <li>→ Identify the constant of proportionality (unit rate) as the constant factor that is multiplied by one quantity to get the other when given a table of equivalent ratios.</li> <li>→ Recognize that <math>x</math> is the input and <math>y</math> is the output in the equation <math>y = kx</math></li> <li>→ Use the constant of proportionality (unit rate) to write an equation in the form of <math>y = kx</math>, where <math>k</math> is the constant of proportionality when given a table of values.</li> </ul>	<ul style="list-style-type: none"> <li>→ Generate a graph and use it to determine if quantities are proportionally related.</li> <li>→ Generate a table of values and use it to determine if quantities are proportionally related.</li> <li>→ Determine if the quantities are proportionally related when given a verbal description or diagram.</li> <li>→ Identify the constant of proportionality (unit rate) from a wide variety of representations of a proportional relationship.</li> <li>→ Use the concept of equality to write a two-variable equation (in the form of <math>y = kx</math>) to represent a proportional relationship when given a context.</li> <li>→ Explain what the point <math>(1, r)</math> means in terms of the situation represented when given a graph.</li> <li>→ Interpret the meaning of any ordered pair on a graph in terms of the context.</li> </ul>	<ul style="list-style-type: none"> <li>→ Represent a non-proportional relationship and explain why the quantities are not proportionally related.</li> <li>→ Provide a contextual situation to represent a given a table, graph, or equation.</li> <li>→ Explain the constant of proportionality (unit rate) in terms of the context.</li> <li>→ Use the constant of proportionality to make connections between multiple representations in terms of the context.</li> <li>→ Draw conclusions that all points on a line are proportional to all other points on the line by relying on tables, verbal statements, or logical arguments to draw the conclusion.</li> <li>→ Explain why graphs of proportional relationships go through the origin.</li> </ul>
<p>1.6</p>	<p><b>7.R.P.A.3</b>  <b>Use proportional relationships to solve multi-step ratio and percent problems. Examples: batting averages, recipes, simple interest, tax, markups and markdowns,</b></p>	<ul style="list-style-type: none"> <li>→ Understand that a percent is a ratio comparing a number to 100.</li> <li>→ Choose a proportion that models a simple mathematical or real-world situation involving a ratio or</li> </ul>	<ul style="list-style-type: none"> <li>→ Solve multi-step ratio and percent problems in a variety of real-world contexts.</li> <li>→ Determine the percent change from one quantity to another and identify the change as an increase or a</li> </ul>	<ul style="list-style-type: none"> <li>→ Solve multi-step ratio and percent problems in complex situations and explain the solution in terms of the context.</li> </ul>

	<p><b>gratuities and commissions, fees, percent increase and decrease, percent error, etc.</b></p>	<p>percent.</p> <ul style="list-style-type: none"> <li>→ Solve simple ratio or percent problems without a context.</li> <li>→ <del>Solve percent problems involving both finding a percent of a quantity and finding the whole.</del></li> </ul>	<p>decrease.</p>	
<p>8th Grade 4.1 4.4</p>	<p><b>8.EE.B.5</b> Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. <i>For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.</i></p>	<ul style="list-style-type: none"> <li>→ Choose a graph that represents a given proportional relationship.</li> <li>→ Identify the unit rate as the slope in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</li> </ul>	<ul style="list-style-type: none"> <li>→ Graph a given proportional relationship.</li> <li>→ Identify the slope from a provided graph of a proportional relationship and connect it to the unit rate.</li> <li>→ Compare two different proportional relationships represented in different ways.</li> </ul>	<ul style="list-style-type: none"> <li>→ Compare two proportional relationships generated from different contexts in terms of the contexts they represent</li> <li>→ Identify the context of the unit rate from the graph of a proportional relationship generated from a contextual problem.</li> </ul>

## MODULE 2 | SOLVE PERCENT PROBLEMS

Module 2 : Students will solve multi-step percent problems.

TN Reveal Lessons: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7

Aug 31 - Sept 15

LESSON	STANDARD	MODULE 2 INSTRUCTIONAL FOCUS		
		APPROACHING UNDERSTANDING (1-2)	GRADE-LEVEL UNDERSTANDING (3)	EXTENSIVE UNDERSTANDING (4)
2.1 2.2 2.3 2.4 2.5 2.6 2.7	<b>7.RP.A.3</b> <b>Use proportional relationships to solve multi-step ratio and percent problems.</b> <b>Examples: batting averages, recipes, simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error, etc.</b>	<ul style="list-style-type: none"> <li>→ Understand that a percent is a ratio comparing a number to 100.</li> <li>→ Choose a proportion that models a simple mathematical or real-world situation involving a ratio or percent.</li> <li>→ Solve simple ratio or percent problems without a context.</li> <li>→ Solve percent problems involving both finding a percent of a quantity and finding the whole.</li> </ul>	<ul style="list-style-type: none"> <li>→ Solve multi-step ratio and percent problems in a variety of real-world contexts.</li> <li>→ Determine the percent change from one quantity to another and identify the change as an increase or a decrease.</li> </ul>	<ul style="list-style-type: none"> <li>→ Solve multi-step ratio and percent problems in complex situations and explain the solution in terms of the context.</li> </ul>
2.1 2.2 2.3 2.4 2.5 2.6 2.7	<b>7.EE.B.3</b> <b>Solve multi-step real-world and mathematical problems posed with positive and negative rational numbers presented in any form (whole numbers, fractions, and decimals).</b> <b>7.EE.B.3a Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate.</b> <b>7.EE.B.3b Assess the reasonableness of answers using mental computation and estimation strategies.</b>	<ul style="list-style-type: none"> <li>→ Solve single-step mathematical problems with positive rational numbers presented in a single form. Conversion between forms of rational numbers is not required to solve the problem.</li> <li>→ Solve single-step mathematical problems involving positive and negative rational numbers written in a single form. Conversion between forms of rational numbers is not required to solve the problem.</li> </ul>	<ul style="list-style-type: none"> <li>→ Solve multi-step, real-world and mathematical problems with rational numbers where conversion between forms of rational numbers may or may not be required.</li> <li>→ Apply appropriate estimation strategies to solve multi-step real world and mathematical problems.</li> </ul>	<ul style="list-style-type: none"> <li>→ Solve multi-step, real-world and mathematical problems with rational numbers where conversion between forms of rational numbers is required.</li> <li>→ Assess the reasonableness of answers resulting from multi-step, real-world and mathematical problems with rational numbers presented in any multiple forms.</li> </ul>
2.2 2.4	<b>7.EE.A.2</b> <b>Rewrite and connect equivalent expressions in different forms in a</b>	<ul style="list-style-type: none"> <li>→ Choose an expression that represents a given real-world situation. Identify independent and</li> </ul>	<ul style="list-style-type: none"> <li>→ . Generate an equivalent expression to highlight a given relationship within the</li> </ul>	<ul style="list-style-type: none"> <li>→ Generate an expression that accurately</li> </ul>

	<p><b>contextual problem to provide multiple ways of interpreting the problem and investigating how the quantities in it are related. For example, shoes are on sale at a 25% discount. How is the discounted price P related to the original cost C of the shoes? <math>C - .25C = P</math>. In other words, P is 75% of the original cost for <math>C - .25C</math> can be written as <math>.75C</math>.</b></p>	<p>dependent variables in a contextual problem.</p> <p>→ Choose a form of an expression that accurately highlights a particular relationship between quantities in a problem.</p>	<p>problem, given a contextual problem and an expression that represents it.</p> <p>→ Choose multiple forms of an expression and explain how each accurately highlights a particular relationship between quantities in a problem.</p>	<p>highlights a particular relationship between quantities in a contextual problem.</p> <p>→ Explain the relationship that exist between different expressions representing the same contextual problem and write a justification as to when each might be more beneficial.</p>
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## MODULES 3 & 4 | OPERATIONS WITH RATIONAL NUMBERS

Module 3 : Students will add, subtract, multiply and divide integers.

TN Reveal Lessons - 3.1, 3.2, 3.3, 3.4, 3.5

Sept 16 - Oct 9

LESSON	STANDARD	MODULE 3 INSTRUCTIONAL FOCUS		
		APPROACHING UNDERSTANDING (1-2)	GRADE-LEVEL UNDERSTANDING (3)	EXTENSIVE UNDERSTANDING (4)
3.1 3.2 3.5	<b>7.NS.A.1</b> <b>Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number</b>	→ Identify that the sum of a number and its opposite is 0, and that these numbers are called “additive inverses”.	→ Generate a number line diagram that represents a given addition or subtraction problem of rational numbers.  → Add and subtract rational	→ Represent addition and subtraction of rational numbers on a horizontal and a vertical number line.  → Provide a model and an explanation to show why p -

	<p>line diagram.  <b>7.NS.A.1a Understand <math>p + q</math> as the number located a distance <math> q </math> from <math>p</math>, in the positive or negative direction depending on whether <math>q</math> is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.</b>  <b>7.NS.A.1b Understand subtraction of rational numbers as adding the additive inverse, <math>p - q = p + (-q)</math>. Show that the distance between two rational numbers on the number line is the absolute value of their difference and apply this principle in real-world contexts.</b>  <b>7.NS.A.1c Apply properties of operations as strategies to add and subtract rational numbers.</b></p>	<ul style="list-style-type: none"> <li>→ Identify situations in which opposite quantities combine to make 0.</li> <li>→ Choose a number line diagram that represents a given addition or subtraction problem of rational numbers.</li> <li>→ Choose a real-world context to represent a given sum or difference of rational numbers.</li> </ul>	<p>numbers.</p> <ul style="list-style-type: none"> <li>→ Explain that the sum <math>p + q</math> is located a distance <math> q </math> from <math>p</math> and when it goes in the negative direction and when it goes in the positive direction.</li> <li>→ Create a real-world context to represent a given sum or difference of rational numbers.</li> <li>→ Identify that the distance between two rational numbers on a number line is the absolute value of their difference.</li> </ul>	<p><math>q</math> and <math>p + (-q)</math> are equal.</p> <ul style="list-style-type: none"> <li>→ Create contextual problems that involve applying properties of operations to add and subtract rational numbers and interpret the respective sum or difference.</li> </ul>
<p>3.1 3.2 3.3 3.4 3.5</p>	<p><b>7.EE.B.3</b>  <b>Solve multi-step real-world and mathematical problems posed with positive and negative rational numbers presented in any form (whole numbers, fractions, and decimals).</b>  <b>7.EE.B.3a Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate.</b>  <b>7.EE.B.3b Assess the reasonableness of answers using mental computation and estimation strategies.</b></p>	<ul style="list-style-type: none"> <li>→ Solve single-step mathematical problems with positive rational numbers presented in a single form. Conversion between forms of rational numbers is not required to solve the problem.</li> <li>→ Solve single-step mathematical problems involving positive and negative rational numbers written in a single form. Conversion between forms of rational numbers is not required to solve the problem.</li> </ul>	<ul style="list-style-type: none"> <li>→ Solve multi-step, real-world and mathematical problems with rational numbers where conversion between forms of rational numbers may or may not be required.</li> <li>→ Apply appropriate estimation strategies to solve multi-step real world and mathematical problems.</li> </ul>	<ul style="list-style-type: none"> <li>→ Solve multi-step, real-world and mathematical problems with rational numbers where conversion between forms of rational numbers is required.</li> <li>→ Assess the reasonableness of answers resulting from multi-step, real-world and mathematical problems with rational numbers presented in any multiple forms.</li> </ul>
<p>3.1 3.2 3.3 3.4 3.5</p>	<p><b>7.NS.A.3</b>  <b>Solve real-world and mathematical problems involving the four operations with rational numbers. (Computations with rational numbers extend the rules for manipulating fractions to complex fractions.)</b></p>	<ul style="list-style-type: none"> <li>→ Solve one-step mathematical problems involving addition and subtraction of positive rational numbers.</li> <li>→ Solve one-step real-world problems involving addition and subtraction of positive</li> </ul>	<ul style="list-style-type: none"> <li>→ Solve multi-step real-world problems involving the four operations with rational numbers.</li> <li>→ Solve mathematical problems involving operations with</li> </ul>	<ul style="list-style-type: none"> <li>→ Create multi-step real-world problems that involve a wide variety of operations with rational numbers.</li> <li>→ Justify the solution path to solve real-world problems involving multiple operations</li> </ul>

		<p>rational numbers</p> <ul style="list-style-type: none"> <li>→ Apply the order of operations to evaluate numerical expressions with positive rational numbers.</li> <li>→ Choose a division problem that represents a complex fraction.</li> <li>→ Solve two-step mathematical problems involving multiplication and division of positive rational numbers.</li> <li>→ Solve two-step real-world problems involving multiplication and division of positive rational numbers</li> <li>→ Rewrite a complex fraction as a division problem.</li> <li>→ Apply the order of operations to evaluate numerical expressions with rational numbers and exponents.</li> </ul>	<p>complex fractions.</p> <ul style="list-style-type: none"> <li>→ Solve real-world problems involving operations with complex fractions.</li> <li>→ Apply the order of operations (including grouping symbols and exponents) to solve mathematical and real-world situations involving rational numbers.</li> </ul>	<p>with rational numbers.</p> <ul style="list-style-type: none"> <li>→ Explain the solution to a real-world problem in terms of its context.</li> </ul>
<p>3.3 3.4 3.5</p>	<p><b>7.NS.A.2</b> <b>Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</b> <b>7.NS.A.2a Understand that multiplication is extended from fractions to all rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as <math>(-1)(-1) = 1</math> and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.</b> <b>7.NS.A.2b Understand that integers can be divided, provided that the divisor is not zero,</b></p>	<ul style="list-style-type: none"> <li>→ Convert a fraction with a denominator that is a multiple of 10 to a decimal.</li> <li>→ Divide multi-digit numbers by applying properties of operations as strategies.</li> <li>→ Convert fractions with a denominator of 2, 3, 4, 5, 6, 8, or 10 to a decimal.</li> <li>→ Divide multi-digit numbers using long division.</li> <li>→ Choose a real-world context to represent a given product or quotient of rational</li> </ul>	<ul style="list-style-type: none"> <li>→ Multiply and divide a wide variety of rational numbers.</li> <li>→ Interpret products and quotients of rational numbers by describing real world contexts.</li> <li>→ Apply properties of operations as strategies to multiply and divide rational numbers.</li> <li>→ Create a real-world context to represent a given product or quotient of rational numbers.</li> <li>→ Convert a rational number to</li> </ul>	<ul style="list-style-type: none"> <li>→ Create problems that involve multiplying and dividing rational numbers in real-world and mathematical problems and interpret the respective product and quotient.</li> <li>→ Make generalizations about long division quotients to determine if the decimal form of the rational number will repeat or terminate.</li> <li>→ Explain why multiplying or dividing a negative number by a negative number results in a positive answer using appropriate mathematical</li> </ul>

	<p>and every quotient of integers (with non-zero divisor) is a rational number. If <math>p</math> and <math>q</math> are integers, then <math>-(p/q) = (-p)/q = p/(-q)</math>. Interpret quotients of rational numbers by describing real-world contexts. 7.NS.A.2c Apply properties of operations as strategies to multiply and divide rational numbers. 7.NS.A.2d Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates or eventually repeats.</p>	<p>numbers.</p>	<p>a decimal using long division; know that the decimal form of rational numbers terminates or eventually repeats.</p>	<p>vocabulary.</p> <p>→ Explain why multiplying or dividing a negative number by a positive number or vice versa results in a negative answer using appropriate mathematical vocabulary.</p>
<p>8th Grade 2.1 2.3 2.5</p>	<p>8.NS.A.1 Know that numbers that are not rational are called irrational (e.g., <math>\pi</math>, <math>\sqrt{2}</math>, etc.). Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually or terminates and converts a decimal expansion which repeats eventually or terminates into a rational number.</p>	<ul style="list-style-type: none"> <li>→ Convert fractions to decimals.</li> <li>→ Convert terminating decimals to fractions.</li> <li>→ Differentiate between non-repeating, non-terminating decimals and repeating decimals.</li> <li>→ Differentiate between terminating and repeating decimals.</li> <li>→ Convert repeating decimals to fractions.</li> <li>→ Identify a given number as rational or irrational.</li> </ul>	<ul style="list-style-type: none"> <li>→ Explain how irrational numbers differ from rational numbers.</li> <li>→ Determine when the decimal expansion of a fraction will terminate or repeat.</li> <li>→ Show that the decimal expansion of rational numbers eventually repeats or terminates.</li> </ul>	<p>→ Explain the relationship between numbers within the Real Number System using precise mathematical language.</p>

## MODULE A | EXPONENTS & SCIENTIFIC NOTATION

Module A : Students will develop and use the Laws of Exponents to evaluate, simplify, and perform computation with expressions with powers.

TN Reveal Lessons: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6

Oct 19-23

LESSON	STANDARD	MODULE 1 INSTRUCTIONAL FOCUS		
		APPROACHING UNDERSTANDING (1-2)	GRADE-LEVEL UNDERSTANDING (3)	EXTENSIVE UNDERSTANDING (4)
1.5 1.6	<b>8.EE.A.3</b> Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities and to express how many times as much one is than the other. <i>For example, estimate the population of the United States as <math>3 \times 10^8</math> and the population of the world as <math>7 \times 10^9</math>, and determine that the world population is more than 20 times larger.</i>	<ul style="list-style-type: none"> <li>→ Choose a number expressed in scientific notation to represent a small or large number.</li> <li>→ Estimate powers of 10.</li> <li>→ Estimate very small or very large quantities using numbers that are represented in scientific notation.</li> <li>→ Translate between numbers written in standard form and scientific notation.</li> </ul>	<ul style="list-style-type: none"> <li>→ Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities.</li> <li>→ Indicate how many times larger one number represented in scientific notation is than a second number also expressed in scientific notation.</li> </ul>	<ul style="list-style-type: none"> <li>→ Solve real-world and mathematical problems by comparing estimated quantities represented in scientific notation and explain the benefits for using scientific notation using precise mathematical vocabulary.</li> </ul>

## MODULE 5 | SIMPLIFY ALGEBRAIC EXPRESSIONS

Module 5 : Students will use properties of operations to simplify algebraic expressions.

TN Reveal Lessons - 5.1, 5.2, 5.3, 5.4, 5.5

Oct 26 - Nov 13

LESSON	STANDARD	MODULE 5 INSTRUCTIONAL FOCUS		
		APPROACHING UNDERSTANDING (1-2)	GRADE-LEVEL UNDERSTANDING (3)	EXTENSIVE UNDERSTANDING (4)
5.1 5.2 5.3 5.4 5.5	<b>7.EE.A.1</b> Apply properties of operations as strategies to add, subtract, factor, and expand linear	<ul style="list-style-type: none"> <li>→ Add and subtract linear expressions with positive rational coefficients.</li> <li>→ Choose equivalent expressions resulting from</li> </ul>	<ul style="list-style-type: none"> <li>→ Add, subtract, factor, or expand linear expressions with rational coefficients to generate equivalent expressions.</li> </ul>	<ul style="list-style-type: none"> <li>→ Generate equivalent expressions resulting from adding, subtracting, factoring, or expanding linear expressions with rational coefficients and explain their</li> </ul>

	<b>expressions with rational coefficients.</b>	<p>factoring or expanding linear expressions with positive whole number coefficients</p> <p>→ Choose equivalent expressions resulting from adding, subtracting, factoring, or expanding linear expressions with rational coefficients.</p>		reasoning using precise mathematical vocabulary
<p>5.1 5.2 5.3 5.4</p>	<p><b>7.EE.A.2</b> <b>Rewrite and connect equivalent expressions in different forms in a contextual problem to provide multiple ways of interpreting the problem and investigating how the quantities in it are related. For example, shoes are on sale at a 25% discount. How is the discounted price P related to the original cost C of the shoes? <math>C - .25C = P</math>. In other words, P is 75% of the original cost for C - .25C can be written as .75C.</b></p>	<p>→ Choose an expression that represents a given real-world situation. Identify independent and dependent variables in a contextual problem.</p> <p>→ Choose a form of an expression that accurately highlights a particular relationship between quantities in a problem.</p>	<p>→ Generate an equivalent expression to highlight a given relationship within the problem, given a contextual problem and an expression that represents it.</p> <p>→ Choose multiple forms of an expression and explain how each accurately highlights a particular relationship between quantities in a problem.</p>	<p>→ Generate an expression that accurately highlights a particular relationship between quantities in a contextual problem.</p> <p>→ Explain the relationship that exist between different expressions representing the same contextual problem and write a justification as to when each might be more beneficial.</p>

## MODULES 6 & 7 | WRITE & SOLVE EQUATIONS AND INEQUALITIES

TN Reveal Lessons - 6.1, 6.2, 6.3, 6.4, 6.5

Nov 16 - Dec 17

LESSON	STANDARD	MODULE 6 INSTRUCTIONAL FOCUS		
		APPROACHING UNDERSTANDING (1-2)	GRADE-LEVEL UNDERSTANDING (3)	EXTENSIVE UNDERSTANDING (4)
6.1	7.EE.B.4	→ Identify the variable quantity	→ Represent real-word	→ Solve real-world problems

<p>6.2 6.3 6.4 6.5</p>	<p><b>Use variables to represent quantities in a real-world and mathematical problem and construct simple equations and inequalities to solve problems by reasoning about the quantities.</b> 7.EE.B.4a Solve real-world and mathematical problems leading to equations of the form <math>px + q = r</math> and <math>p(x + q) = r</math>, where <math>p</math>, <math>q</math>, and <math>r</math> are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?</p>	<p>in a real-world or mathematical situation.</p> <ul style="list-style-type: none"> <li>→ Choose an equation in the form <math>p + q = r</math> or <math>px = r</math> to represent a given contextual problem.</li> <li>→ Choose the solution for equations of the form <math>px + q = r</math> and <math>p(x + q) = r</math> when <math>p</math>, <math>q</math>, and <math>x</math> are all whole numbers.</li> <li>→ Choose an equation in the form <math>px + q = r</math> or <math>p(x + q) = r</math> to represent a given contextual problem.</li> </ul>	<p>problems using equations in the form <math>px + q = r</math> or <math>p(x + q) = r</math>.</p> <ul style="list-style-type: none"> <li>→ Fluently solve equations in the form <math>px + q = r</math> or <math>p(x + q) = r</math>.</li> </ul>	<p>leading to equations in the form <math>px + q = r</math> or <math>p(x + q) = r</math> both algebraically and arithmetically and identify the similarities and differences between both approaches.</p>
<p>6.1 6.2 6.3 6.4 6.5</p>	<p><b>7.EE.B.3</b> Solve multi-step real-world and mathematical problems posed with positive and negative rational numbers presented in any form (whole numbers, fractions, and decimals). 7.EE.B.3a Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate. 7.EE.B.3b Assess the reasonableness of answers using mental computation and estimation strategies.</p>	<ul style="list-style-type: none"> <li>→ Solve single-step mathematical problems with positive rational numbers presented in a single form. Conversion between forms of rational numbers is not required to solve the problem.</li> <li>→ Solve single-step mathematical problems involving positive and negative rational numbers written in a single form. Conversion between forms of rational numbers is not required to solve the problem.</li> </ul>	<ul style="list-style-type: none"> <li>→ Solve multi-step, real-world and mathematical problems with rational numbers where conversion between forms of rational numbers may or may not be required.</li> <li>→ Apply appropriate estimation strategies to solve multi-step real world and mathematical problems.</li> </ul>	<ul style="list-style-type: none"> <li>→ Solve multi-step, real-world and mathematical problems with rational numbers where conversion between forms of rational numbers is required.</li> <li>→ Assess the reasonableness of answers resulting from multi-step, real-world and mathematical problems with rational numbers presented in any multiple forms.</li> </ul>
<p>7.1 7.2 7.3 7.4 7.5 7.6</p>	<p><b>7.EE.B.4</b> Use variables to represent quantities in a real-world and mathematical problem and construct simple equations and inequalities to solve problems by reasoning about the quantities. <del>7.EE.B.4a Solve real-world and</del></p>	<ul style="list-style-type: none"> <li>→ Identify the variable quantity in a real-world or mathematical situation.</li> <li>→ Choose a number line graph that represents a given inequality in the</li> </ul>	<ul style="list-style-type: none"> <li>→ Solve real-world problems leading to inequalities in the form <math>px + q &gt; r</math>, <math>px + q &lt; r</math>, <math>px + q \geq r</math> or <math>px + q \leq r</math></li> <li>→ Graph the solution set for an inequality in the form</li> </ul>	<ul style="list-style-type: none"> <li>→ Solve real-world I problems leading to inequalities in the form <math>px + q &gt; r</math>, <math>px + q &lt; r</math>, <math>px + q \geq r</math> or <math>px + q \leq r</math> where <math>p</math>, <math>q</math>, and <math>r</math> are specific rational numbers and identify and</li> </ul>

	<p><b>mathematical problems leading to equations of the form <math>px + q = r</math> and <math>p(x + q) = r</math>, where <math>p</math>, <math>q</math>, and <math>r</math> are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?</b></p> <p><b>7.EE.B.4b Solve real-world and mathematical problems leading to inequalities of the form <math>px + q &gt; r</math>, <math>px + q &lt; r</math>, <math>px + q \geq r</math> or <math>px + q \leq r</math> where <math>p</math>, <math>q</math>, and <math>r</math> are specific rational numbers. Graph the solution set of the inequality on a number line and interpret it in the context of the problem. (Note that inequalities using <math>&gt;</math>, <math>&lt;</math>, <math>\geq</math>, and <math>\leq</math> are included in this standard.) For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make and describe the solutions.</b></p>	<p>form <math>x &gt; c</math>, <math>x &lt; c</math>, <math>x \leq c</math>, or <math>x \geq c</math></p> <p>→ Choose a number line graph that represents the solution set for an inequality in the form <math>px + q &gt; r</math>, <math>px + q &lt; r</math>, <math>px + q \geq r</math> or <math>px + q \leq r</math>.</p> <p>→ Choose an inequality in the form <math>px + q &gt; r</math>, <math>px + q &lt; r</math>, <math>px + q \geq r</math> or <math>px + q \leq r</math> that represents a given real world problem.</p>	<p><math>px + q &gt; r</math>, <math>px + q &lt; r</math>, <math>px + q \geq r</math> or <math>px + q \leq r</math> on a number line.</p> <p>→ Interpret the solution set for an inequality in the form <math>px + q &gt; r</math>, <math>px + q &lt; r</math>, <math>px + q \geq r</math> or <math>px + q \leq r</math> in the context of the problem.</p>	<p>justify the operations used in each approach.</p> <p>→ Interpret the solution set for an inequality and explain the reasonableness of the solution set with respect to the context.</p>
<p>7.1 7.2 7.3 7.4 7.5 7.6</p>	<p><b>7.EE.B.3 Solve multi-step real-world and mathematical problems posed with positive and negative rational numbers presented in any form (whole numbers, fractions, and decimals).</b></p> <p><b>7.EE.B.3a Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate. 7.EE.B.3b Assess the reasonableness of answers using mental computation and estimation strategies.</b></p>	<p>→ Solve single-step mathematical problems with positive rational numbers presented in a single form. Conversion between forms of rational numbers is not required to solve the problem.</p> <p>→ Solve single-step mathematical problems involving positive and negative rational numbers written in a single form. Conversion between forms of rational numbers is not required to solve the problem.</p>	<p>→ Solve multi-step, real-world and mathematical problems with rational numbers where conversion between forms of rational numbers may or may not be required.</p> <p>→ Apply appropriate estimation strategies to solve multi-step real world and mathematical problems.</p>	<p>→ Solve multi-step, real-world and mathematical problems with rational numbers where conversion between forms of rational numbers is required.</p> <p>→ Assess the reasonableness of answers resulting from multi-step, real-world and mathematical problems with rational numbers presented in any multiple forms.</p>

# MODULE 10 | PROBABILITY

Module 10 : Students will understand probability, find the probability of simple events and compound events, and design simulations.

TN Reveal Lessons - 10.1, 10.2, 10.3, 10.4

Jan 6 - Jan 22

LESSON	STANDARD	MODULE 10 INSTRUCTIONAL FOCUS		
		APPROACHING UNDERSTANDING (1-2)	GRADE-LEVEL UNDERSTANDING (3)	EXTENSIVE UNDERSTANDING (4)
10.1	<b>7.SPC.5</b> Recognize that the probability of a chance event is a number between 0 and 1 and interpret the likelihood of the event occurring.	<ul style="list-style-type: none"> <li>→ Define probability as the likelihood of a chance event occurring.</li> <li>→ Define the complement of an event as the chance of the event not occurring.</li> <li>→ Recognize that the probability of a chance event can be represented as a rational number from 0 to 1.</li> </ul>	<ul style="list-style-type: none"> <li>→ Recognize that an impossible event has a probability of 0 and that a certain event has a probability of 1.</li> <li>→ Recognize that a probability closer to 0 represents an unlikely chance event, a probability close to <math>\frac{1}{2}</math> represents an equally likely (to occur or not occur) chance event and a probability closer to 1 represents a likely chance event.</li> <li>→ Understand that a chance event and its complement has a sum of 1.</li> <li>→ Conduct simple experiments and calculate probabilities as fractions, decimals, and/or percent.</li> <li>→ Determine where probabilities of simple events lie on the</li> </ul>	<ul style="list-style-type: none"> <li>→ Justify the categorization of events as likely, unlikely or equally likely (to occur or not occur) using precise mathematical vocabulary.</li> <li>→ Use reasoning to determine and explain where a probability lies on the scale when expressed as a fraction such as <math>\frac{3}{8}</math>.</li> </ul>

			probability scale.	
10.2 10.3 10.4	<p><b>7.SPC.6</b>  <b>Calculate theoretical and experimental probability of simple events.</b>  <b>7.SPC.6.a Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.</b>  <b>7.SPC.6.b Calculate the theoretical probability of a simple event.</b>  <b>7.SPC.6.c Compare theoretical probabilities to experimental probabilities; explain any possible sources of discrepancy. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times</b></p>	<ul style="list-style-type: none"> <li>→ Recognize that the probability of a chance event can be represented as a rational number from 0 to 1.</li> <li>→ Express the probability of a single event using the appropriate terms impossible, unlikely, equally likely, likely, or certain.</li> <li>→ Conduct simple experiments and calculate probabilities as fractions, decimals and/or percents.</li> <li>→ Recognize theoretical probability as what should mathematically occur and experimental probability as the actual outcome of an experiment.</li> <li>→ Recognize relative frequency as the observed number of successful events for a finite sample of trials.</li> </ul>	<ul style="list-style-type: none"> <li>→ Determine the theoretical probability of a simple event.</li> <li>→ Determine the experimental probability of a simple event.</li> <li>→ Differentiate between experimental and theoretical probability of a simple event.</li> <li>→ Estimate the probability of an event by collecting data and observing its long-run frequency.</li> <li>→ Compare probability models to observed frequencies and explain any discrepancies between the model and observed frequencies.</li> </ul>	<ul style="list-style-type: none"> <li>→ Explain orally and in writing any discrepancies between theoretical and experimental probabilities using precise mathematical vocabulary.</li> </ul>
10.2 10.3 10.4	<p><b>7.SPC.7</b>  <b>Develop a probability model and use it to find experimental or theoretical probabilities of events.</b>  <b>7.SPC.7.a Use a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.</b>  <b>7.SPC.7.b Develop a probability model, including non-uniform models, by observing frequencies in data generated from a chance process. Use the model to</b></p>	<ul style="list-style-type: none"> <li>→ Conduct simple experiments and express probabilities as fractions, decimals and/or percents.</li> <li>→ Recognize theoretical probability as what should mathematically occur and experimental probability as the actual outcome of an experiment.</li> <li>→ Approximate theoretical probability and experimental probability in real-world situations.</li> <li>→ Recognize that probability estimates are affected by sample size.</li> <li>→ Understand the difference between uniform and non-uniform probability models.</li> </ul>	<ul style="list-style-type: none"> <li>→ Develop appropriate probability models to find probabilities of events with equally likely outcomes.</li> <li>→ Develop appropriate probability models to find probabilities of events with outcomes that are not equally likely.</li> <li>→ Develop probability models by observing frequencies and approximating the probability using hands-on experiments.</li> </ul>	<ul style="list-style-type: none"> <li>→ Design and conduct probability experiments, making conjectures about the outcomes using precise mathematical vocabulary.</li> <li>→ Justify conjectures made about experimental probabilities.</li> </ul>

	<p>estimate the probabilities of events. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?</p>			
	<p><b>8.SP.B.4</b>  <b>Find probabilities of and represent sample spaces for compound events using organized lists, tables, tree diagrams, and simulation.</b>  <b>8.SP.B.4.a 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.</b>  <b>8.SP.B.4.b 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.</b></p>	<ul style="list-style-type: none"> <li>→ Determine the probability of a simple event.</li> <li>→ Understand that a probability is between 0 and 1, and that something unlikely to happen has a probability closer to 0, something likely to happen has a probability closer to 1, and something equally likely to happen is halfway between 0 and 1.</li> <li>→ Express the probability of a single event using the appropriate terms impossible, unlikely, equally likely, likely, or certain.</li> <li>→ Express probability of a simple event as a fraction, decimal and/or percent.</li> <li>→ Differentiate between simple events and compound events.</li> <li>→ Differentiate between theoretical and experimental probability.</li> <li>→ Estimate the probability of an event by collecting data and observing its long-run frequency.</li> </ul>	<ul style="list-style-type: none"> <li>→ Determine the sample space of a compound event.</li> <li>→ Use probabilities to make decisions in real-world situations.</li> <li>→ Determine the probability of a compound event from a sample space.</li> <li>→ Recognize that the number of possible outcomes for a compound event is determined by multiplying the number of outcomes for each individual event.</li> <li>→ Determine the probability of compound events using lists, tables, tree diagrams, and simulations.</li> <li>→ Compare compound probabilities that are based on theoretical models with experimental probability simulations.</li> <li>→ Express the probability of a compound event as a fraction, decimal, and/or percent.</li> </ul>	<ul style="list-style-type: none"> <li>→ Determine whether or not a given probability model is plausible and justify your explanation.</li> <li>→ Explain how a given contextual situation models a compound event and how the probability can be approximated.</li> <li>→ Design a simulation and use the results to estimate a probability.</li> </ul>

# MODULE 11 | SAMPLING and STATISTICS

Module 11 : Students will analyze samples and interpret the data

TN Reveal Lessons - 11.1, 11.2, 11.3, 11.4, 11.5, 11.6

Jan 25 - Feb 15

LESSON	STANDARD	MODULE 11 INSTRUCTIONAL FOCUS		
		APPROACHING UNDERSTANDING (1-2)	GRADE-LEVEL UNDERSTANDING (3)	EXTENSIVE UNDERSTANDING (4)
11.1	<b>7.SP.A.1</b> Explore how statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	<ul style="list-style-type: none"> <li>→ Define random sampling.</li> <li>→ Collect sample data from a population.</li> <li>→ Generate a statistical question in a real-world context.</li> <li>→ Explain the importance of random sampling in statistics.</li> <li>→ Differentiate between a sample and population.</li> <li>→ Recognize invalid sampling techniques.</li> </ul>	<ul style="list-style-type: none"> <li>→ Determine if a sample is representative of a population</li> <li>→ Determine if a sample is biased.</li> <li>→ Identify factors that would contribute to bias.</li> <li>→ Generate random samples that are representative of a larger population.</li> </ul>	<ul style="list-style-type: none"> <li>→ Conduct a survey and explain why the method used will produce a sample that is unbiased and representative of the population.</li> <li>→ Explain adjustments needed to produce a representative sample when given an invalid sampling technique,</li> <li>→ Critique examples of random sampling as statistical tools using precise mathematical vocabulary</li> </ul>

<p>11.1 11.2 11.3</p>	<p><b>7.SP.A.2</b> <b>Collect and use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.</b></p>	<ul style="list-style-type: none"> <li>→ Explain the benefits of random sampling.</li> <li>→ Differentiate between a sample and population.</li> <li>→ Determine if a sample is representative of a population.</li> <li>→ Generate multiple samples that are representative of a larger population</li> <li>→ Describe a sample using a measure of center or variation</li> <li>→ Differentiate between sample measures and population measures.</li> </ul>	<ul style="list-style-type: none"> <li>→ Recognize that increasing sample size affects sampling variability.</li> <li>→ Make inferences and generalizations about a population by collecting and using data from random samples.</li> <li>→ Justify inferences and generalizations using appropriate mathematical vocabulary</li> <li>→ Recognize how sample variations affect the accuracy of predictions.</li> </ul>	<ul style="list-style-type: none"> <li>→ Explain the impact of sample size on sampling variability with precise mathematical language.</li> <li>→ Assess the accuracy of a prediction using multiple random samples.</li> </ul>
<p>11.2 11.3</p>	<p><b>7.RP.A.2</b> <b>Recognize and represent proportional relationships between quantities.</b></p>	<ul style="list-style-type: none"> <li>→ Graph points on the coordinate plane when given a table of values.</li> <li>→ From context generate tables of equivalent ratios, find a missing number in the table, and use the table to plot the ratios on a coordinate graph.</li> <li>→ Choose the constant of proportionality (unit rate) when given a graph.</li> <li>→ Differentiate between independent and dependent variables.</li> <li>→ Know that the graph of a proportional relationship must be linear and pass through the origin.</li> <li>→ Choose the constant of proportionality (unit rate) when given a table.</li> <li>→ Identify the constant of proportionality (unit rate) as the constant factor that is multiplied by one quantity to get the other when</li> </ul>	<ul style="list-style-type: none"> <li>→ Generate a graph and use it to determine if quantities are proportionally related.</li> <li>→ Generate a table of values and use it to determine if quantities are proportionally related.</li> <li>→ Determine if the quantities are proportionally related when given a verbal description or diagram.</li> <li>→ Identify the constant of proportionality (unit rate) from a wide variety of representations of a proportional relationship.</li> <li>→ Use the concept of equality to write a two-variable equation (in the form of <math>yy = kkkk</math>) to represent a proportional relationship when given a context.</li> <li>→ Explain what the point (1, r) means in terms of the situation represented when given a</li> </ul>	<ul style="list-style-type: none"> <li>→ Represent a non-proportional relationship and explain why the quantities are not proportionally related.</li> <li>→ Provide a contextual situation to represent a given a table, graph, or equation.</li> <li>→ Explain the constant of proportionality (unit rate) in terms of the context.</li> <li>→ Use the constant of proportionality to make connections between multiple representations in terms of the context.</li> <li>→ Draw conclusions that all points on a line are proportional</li> </ul>

		<p>given a table of equivalent ratios.</p> <ul style="list-style-type: none"> <li>→ Recognize that <math>x</math> is the input and <math>y</math> is the output in the equation <math>y = kx</math>.</li> <li>→ Identify the constant of proportionality (unit rate) when given an equation in the form <math>y = kx</math></li> <li>→ Use the constant of proportionality (unit rate) to write an equation in the form of <math>yy = kkkk</math>, where <math>k</math> is the constant of proportionality when given a table of values.</li> </ul>	<p>graph.</p> <ul style="list-style-type: none"> <li>→ Interpret the meaning of any ordered pair on a graph in terms of the context.</li> </ul>	<p>to all other points on the line by relying on tables, verbal statements, or logical arguments to draw the conclusion.</p> <ul style="list-style-type: none"> <li>→ Explain why graphs of proportional relationships go through the origin.</li> </ul>
<p><b>11.2</b></p>	<p><b>7.RP.A.3</b>  <b>Use proportional relationships to solve multi-step ratio and percent problems.</b>  <i>Examples: batting averages, recipes, simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error, etc.</i></p>	<ul style="list-style-type: none"> <li>→ Understand that a percent is a ratio comparing a number to 100.</li> <li>→ Choose a proportion that models a simple mathematical or real-world situation involving a ratio or percent.</li> <li>→ Solve simple ratio or percent problems without a context.</li> <li>→ Solve percent problems involving both finding a percent of a quantity and finding the whole.</li> </ul>	<ul style="list-style-type: none"> <li>→ Solve multi-step ratio and percent problems in a variety of real-world contexts.</li> <li>→ Determine the percent change from one quantity to another and identify the change as an increase or a decrease.</li> </ul>	<ul style="list-style-type: none"> <li>→ Solve multi-step ratio and percent problems in complex situations and explain the solution in terms of the context.</li> </ul>
<p><b>11.4</b></p>	<p><b>7.SP.B.4</b>  <b>Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a 7th grade science book are generally longer than the words in a chapter of a 4th grade science book.</b></p>	<ul style="list-style-type: none"> <li>→ Describe a sample using measures of center.</li> <li>→ Describe a sample using measures of variability.</li> <li>→ Determine the appropriate measure of center or variability for describing a single data set.</li> <li>→ Make inferences about a single population using data from random samples.</li> <li>→ Draw comparative conclusions about two populations using graphs.</li> </ul>	<ul style="list-style-type: none"> <li>→ Determine the appropriate measure of center or variability for comparing two data sets</li> <li>→ Draw valid comparative inferences about two populations using measures of center.</li> <li>→ Draw valid comparative inferences about two populations using measures of variability.</li> <li>→ Identify valid inferences related to the comparison of two data sets and justify why they are valid.</li> </ul>	<ul style="list-style-type: none"> <li>→ Critique the selection of a measure of center or variability that is used to compare two data sets.</li> <li>→ Critique comparative inferences about two populations using appropriate mathematical vocabulary.</li> </ul>

<p><b>11.4</b> <b>11.5</b></p>	<p><b>7.SP.D.8</b> <b>Summarize a numerical data set in relation to its context.</b> <b>7.SP.D.8.a. Give quantitative measures of center (median and/or mean) and variability (range and/or interquartile range), as well as describe any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.</b> <b>7.SP.D.8.b. Relate and understand the choice of measures of center (median and/or mean) and variability (range and/or interquartile range) to the shape of the data distribution and the context in which the data were gathered</b></p>	<ul style="list-style-type: none"> <li>→ Summarize data sets using measures of center.</li> <li>→ Create dot plots, histograms, and box plots from numerical data.</li> <li>→ Summarize data sets using measures of variability.</li> <li>→ Interpret dot plots, histograms, and box plots in relation to the context of the statistical question.</li> </ul>	<ul style="list-style-type: none"> <li>→ Determine the most appropriate measure of center and variability to summarize data derived from real world context.</li> <li>→ Use graphs to describe patterns in data derived from real world context.</li> <li>→ Recognize how measures of center and variability affect the shapes of data distributions.</li> </ul>	<ul style="list-style-type: none"> <li>→ Construct viable arguments to explain the selection of statistical measures, predicting how changes in the data affect those statistical measures.</li> </ul>
<p><b>11.6</b></p>	<p><b>7.SP.B.3</b> <b>Informally compare the measures of center (mean, median, mode) of two numerical data distributions with similar variabilities. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team; on a dot plot or box plot, the separation between the two distributions of heights is noticeable.</b></p>	<ul style="list-style-type: none"> <li>→ Recognize when an overlap exists between two data sets.</li> <li>→ Determine the center of numerical data sets.</li> <li>→ Represent real-world data sets using dot plots, box plots or histograms.</li> <li>→ Solve problems involving data from a dot plot, box plot, or histogram.</li> </ul>	<ul style="list-style-type: none"> <li>→ Compare the measures of center (mean, median, mode) of two data sets with similar variability.</li> <li>→ Model and compare two real-world data sets by measuring the difference between their measures of center.</li> </ul>	<ul style="list-style-type: none"> <li>→ Determine and explain when the difference in the measures of center of two data sets is meaningful.</li> </ul>

## MODULE 8 | GEOMETRIC FIGURES

Module 8 : Students will draw, describe, and solve problems involving geometric figures.

TN Reveal Lessons - 8.1, 8.2, 8.3, 8.4, 8.5

Feb 16 - March 9

LESSON	STANDARD	MODULE 8 INSTRUCTIONAL FOCUS		
		APPROACHING UNDERSTANDING (1-2)	GRADE-LEVEL UNDERSTANDING (3)	EXTENSIVE UNDERSTANDING (4)
8.1 8.2	<b>7.G.B.4</b> <b>Know and use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.</b>	<ul style="list-style-type: none"> <li>→ Write and solve simple equations.</li> <li>→ Understand that an angle is measured by the degree it opens.</li> <li>→ Recognize when angles are adjacent versus non-adjacent.</li> <li>→ Recognize a right angle and a straight angle and know their measurements are <math>90^\circ</math> and <math>180^\circ</math> respectively.</li> <li>→ Classify pairs of angles as supplementary, complementary, vertical, and adjacent angles in a diagram.</li> <li>→ Recognize that supplementary angles have a sum of <math>180^\circ</math> and complementary angles have a sum of <math>90^\circ</math>.</li> <li>→ Recognize that vertical angles have the same measure.</li> </ul>	<ul style="list-style-type: none"> <li>→ Apply the properties of supplementary or complementary angles to write and solve an equation to find unknown angle measures.</li> <li>→ Apply the relationship of vertical angles to write and solve an equation to find unknown angle measures.</li> <li>→ Apply the properties of adjacent angles to write and solve an equation to find unknown angle measures.</li> <li>→ Justify the equations and the solution paths to multi-step problems involving angle relationships using precise mathematical language.</li> </ul>	<ul style="list-style-type: none"> <li>→ Create problems related to finding unknown angle measures that involve supplementary, complementary, vertical, and adjacent angles in a real-world setting.</li> </ul>
8.3 8.4	<b>7.G.A.1</b> <b>Solve problems involving scale drawings of congruent and similar geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.</b>	<ul style="list-style-type: none"> <li>→ Measure a real-world object using a ruler or tape measure.</li> <li>→ Measure a drawing using a ruler.</li> <li>→ Find the area of a given triangle or quadrilateral.</li> </ul>	<ul style="list-style-type: none"> <li>→ Draw a scale drawing of a geometric figure given a scale factor and the original figure.</li> <li>→ Given a scale drawing, compute the lengths and area of the original</li> </ul>	<ul style="list-style-type: none"> <li>→ Explain the process of generating scaled drawings using precise mathematical vocabulary</li> <li>→ Create and solve multi-step realworld problems involving scale drawings, explaining their reasoning for the</li> </ul>

		<ul style="list-style-type: none"> <li>→ Accurately identify figures as congruent or similar.</li> <li>→ For similar figures, understand that scale factors that are between 0 and 1 result in a reduction in size and scale factors greater than 1 result in an enlargement.</li> <li>→ Understand that the scale factor for congruent figures is 1.</li> <li>→ Understand that the scale factor for congruent figures is 1.</li> <li>→ Given a scaled geometric figure and the scale factor that generated it, choose the original figure.</li> </ul>	<p>geometric figure.</p> <ul style="list-style-type: none"> <li>→ Solve problems involving scale drawings of congruent and similar geometric figures.</li> <li>→ Reproduce a scale drawing at a different scale.</li> <li>→ Describe the relationships between the original geometric figure and its scale drawing.</li> </ul>	<p>chosen solution path.</p>
<p><b>8.3</b></p>	<p><b>7.G.A.2</b>  <b>Draw triangles with given conditions: three angle measures or three side measures. Notice when the conditions determine a unique triangle, more than one triangle, or no triangle.</b></p>	<ul style="list-style-type: none"> <li>→ Recognize examples of geometric shapes with given conditions.</li> <li>→ Choose a geometric shape that represents a given set of conditions.</li> </ul>	<ul style="list-style-type: none"> <li>→ Construct triangles given three angle measures or three side lengths.</li> <li>→ Recognize when a given set of line segments will form a triangle</li> <li>→ Recognize that the sum of the angles in a triangle is always <math>180^\circ</math></li> <li>→ Recognize when conditions form a unique triangle, more than one triangle, or no triangle.</li> </ul>	<ul style="list-style-type: none"> <li>→ Create a set of conditions that form a unique triangle, more than one triangle, or no triangle and explain the reasoning using precise mathematical language.</li> </ul>
	<p><b>8.G.A.2</b>  <b>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</b></p>	<ul style="list-style-type: none"> <li>→ Recognize vertical, adjacent, and supplementary angles.</li> <li>→ Identify the exterior angles of a triangle</li> </ul>	<ul style="list-style-type: none"> <li>→ Informally explain the triangle sum theorem using a strategy</li> <li>→ Give informal arguments to establish facts about exterior</li> </ul>	<ul style="list-style-type: none"> <li>→ Justify mathematically the relationships of lines and angles created by parallel lines</li> <li>→ Create and solve a</li> </ul>

	<p><del>the angle-angle criterion for similarity of triangles.</del></p>	<ul style="list-style-type: none"> <li>→ Find the measure of a missing angle in a pair of vertical angles or adjacent supplementary angles when given one angle measure.</li> <li>→ Identify parallel lines and the intersection of a transversal.</li> <li>→ Know that the sum of the angles in a triangle is always 180 degrees.</li> <li>→ Identify the relationship between an interior and an exterior angle of a triangle as supplementary</li> <li>→ Use facts about angle relationships to find a missing interior angle measure of a triangle.</li> <li>→ Define similar figures.</li> </ul>	<p>angles of triangles.</p> <ul style="list-style-type: none"> <li>→ Find and justify missing interior and exterior angle measures of a triangle using facts about angle relationships.</li> <li>→ Informally explain the relationship of angles created by parallel lines cut by a transversal.</li> <li>→ Identify pairs of congruent angles and pairs of supplementary angles formed by parallel lines cut by a transversal.</li> <li>→ Recognize that if two triangles have two pairs of corresponding congruent angles, then they are similar.</li> </ul>	<p>real-world contextual problem involving triangles cut by a transversal.</p> <ul style="list-style-type: none"> <li>→ Create and solve a real-world contextual problem involving angles formed by a pair of parallel lines cut by a transversal.</li> </ul>
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## MODULE 9 | MEASURE FIGURES

Module 9 : Students will solve real-world and mathematical problems involving area, volume, and surface area.

TN Reveal Lessons - 9.1, 9.2, 9.3, 9.4, 9.5, 9.6

March 10 - April 9

LESSON	STANDARD	MODULE 9 INSTRUCTIONAL FOCUS		
		APPROACHING UNDERSTANDING (1-2)	GRADE-LEVEL UNDERSTANDING (3)	EXTENSIVE UNDERSTANDING (4)

<p>9.1 9.2 9.3</p>	<p><b>7.G.B.3</b> <b>Know the formulas for the area and circumference of a circle and use them to solve problems. Explore the relationship between the radius, the circumference, the area of a circle, and the number <math>\pi</math>.</b></p>	<ul style="list-style-type: none"> <li>→ Identify the parts of a circle that represent the radius, diameter, area, and circumference.</li> <li>→ Relate the circumference as a perimeter measurement of the distance around a circle.</li> <li>→ Recognize that pi has an approximate value of 3.14.</li> <li>→ Understand that all the points on a circle are the same distance from the center.</li> <li>→ Find the diameter given the radius and radius given the diameter.</li> <li>→ Identify the formula used to find area of a circle.</li> <li>→ Identify the formula used to find circumference of a circle.</li> <li>→ Informally explain the relationship between circumference and diameter.</li> </ul>	<ul style="list-style-type: none"> <li>→ Know the formulas for the area and circumference of a circle and use them to solve real-world and mathematical problems.</li> <li>→ Determine the radius and/or the diameter of a circle when given the circumference.</li> <li>→ Determine the area of a circle when given the circumference.</li> <li>→ Express the area and circumference of a circle in terms of pi and as an approximate numerical value.</li> <li>→ Informally explain the relationship between the circumference and area of a circle.</li> </ul>	<ul style="list-style-type: none"> <li>→ Justify the relationship that exists between circumference and area written in mathematical explanations</li> <li>→ Create and solve a real-world problem which involves calculating the area and/or circumference of a circle or finding the radius or diameter given the circumference.</li> </ul>
<p>9.4 9.5 9.6</p>	<p><b>7.G.B.5</b> <b>Solve real-world and mathematical problems involving area of two-dimensional figures composed of triangles, quadrilaterals, and polygons, and volume and surface area of three-dimensional objects composed of cubes and right prisms.</b></p>	<ul style="list-style-type: none"> <li>→ Find the area of triangles in real world and mathematical problems</li> <li>→ Find the area of quadrilaterals in real-world and mathematical problems.</li> <li>→ Find the surface area of rectangular prisms, including cubes, in real world and mathematical problems.</li> <li>→ Find the volume of rectangular prisms,</li> </ul>	<ul style="list-style-type: none"> <li>→ Solve real-world and mathematical problems involving area of two dimensional figures composed of triangles, quadrilaterals, and polygons.</li> <li>→ Solve real-world and mathematical problems involving volume and surface area of three-dimensional objects composed of cubes and right prisms.</li> </ul>	<ul style="list-style-type: none"> <li>→ Use reasoning to find possible dimensions when given the surface area or volume of a right prism.</li> <li>→ Use precise mathematical language to explain the relationships between area, volume, and surface area.</li> <li>→ Justify the relationship between the volume of a pyramid and a prism.</li> </ul>

		<p>including cubes, in real world and mathematical problems.</p> <p>→ Find the area of two-dimensional polygons that can be decomposed into rectangles and/or triangles.</p>		
<p>9.6</p>	<p><b>7.G.A.1</b>  <b>Solve problems involving scale drawings of congruent and similar geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.</b></p>	<p>→ Measure a real-world object using a ruler or tape measure.</p> <p>→ Measure a drawing using a ruler.</p> <p>→ Find the area of a given triangle or quadrilateral.</p> <p>→ Accurately identify figures as congruent or similar.</p> <p>→ For similar figures, understand that scale factors that are between 0 and 1 result in a reduction in size and scale factors greater than 1 result in an enlargement.</p> <p>→ Understand that the scale factor for congruent figures is 1.</p> <p>→ Given a geometric figure and a scale factor, choose the scaled figure.</p> <p>→ Given a scaled geometric figure and the scale factor that generated it, choose the original figure.</p>	<p>→ Draw a scale drawing of a geometric figure given a scale factor and the original figure.</p> <p>→ Given a scale drawing, compute the lengths and area of the original geometric figure.</p> <p>→ Solve problems involving scale drawings of congruent and similar geometric figures.</p> <p>→ Reproduce a scale drawing at a different scale.</p> <p>→ Describe the relationships between the original geometric figure and its scale drawing.</p>	<p>→ Explain the process of generating scaled drawings using precise mathematical vocabulary.</p> <p>→ Create and solve multi-step realworld problems involving scale drawings, explaining their reasoning for the chosen solution path.</p>
	<p><b>8.G.C.6</b>  <b>Apply the formulas for the volumes of cones, cylinders, and spheres to solve real-world and</b></p>	<p>→ Identify a cone, cylinder, and sphere.</p> <p>→ Define volume as the</p>	<p>→ Find the volume of cones, cylinders, and spheres.</p> <p>→ Apply volume formulas to</p>	<p>→ Explain how the volume formulas for a cylinder and a right prism are</p>

	<p><b>mathematical problems.</b></p>	<p>number of unit cubes that will fill a three dimensional object.</p> <ul style="list-style-type: none"> <li>→ Find the area of a circle.</li> <li>→ Find the volume of a right prism.</li> <li>→ Identify the key dimensions (i.e., radius, height, circumference and diameter) of cones, cylinders, and spheres.</li> </ul>	<p>solve real-world or mathematical problems involving cones, cylinders, and spheres</p>	<p>related.</p> <ul style="list-style-type: none"> <li>→ Explain how the volume formulas for a cone and a pyramid are related.</li> <li>→ Justify the relationships between the volume of a cylinder, a cone, and a sphere.</li> </ul>
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## Module B | THE PYTHAGOREAN THEOREM

Students will examine angle relationships with triangles and parallel lines and use the Pythagorean Theorem.

TN Reveal Lessons: 7.1, 7.2, 7.3, 7.4, 7.5

After TCAP - May 26

LESSON	STANDARD	INSTRUCTIONAL FOCUS		
		APPROACHING UNDERSTANDING (1-2)	GRADE-LEVEL UNDERSTANDING (3)	EXTENSIVE UNDERSTANDING (4)
7.3 7.4	8.G.B.3 Explain a model of the Pythagorean Theorem and its converse.	<ul style="list-style-type: none"> <li>→ Recognize and define right triangles</li> <li>→ Identify the hypotenuse and legs of a right triangle.</li> <li>→ Represent a number squared using a geometric representation of a square.</li> <li>→ Determine if a triangle is a right triangle using the length</li> </ul>	<ul style="list-style-type: none"> <li>→ Use a model to explain the Pythagorean Theorem.</li> <li>→ Determine if a triangle is a right triangle using the converse of the Pythagorean Theorem, given a model or side lengths.</li> </ul>	<ul style="list-style-type: none"> <li>→ Critique the work of others in justifying the Pythagorean Theorem.</li> <li>→ Critique the work of others in justifying the converse of the Pythagorean Theorem</li> <li>→ Create examples of triangles and explain why they are or are not right triangles using the Pythagorean Theorem or</li> </ul>

		<p>of the sides.</p> <ul style="list-style-type: none"> <li>→ Identify which variables represent the legs and hypotenuse in the formula <math>a^2 + b^2 = c^2</math>.</li> <li>→ Identify which variables represent the legs and hypotenuse in the formula <math>a^2 + b^2 = c^2</math>.</li> </ul>		<p>its converse.</p>
<p>7.3</p>	<p><b>8.G.B.4</b>  <b>Know and apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.</b></p>	<ul style="list-style-type: none"> <li>→ Identify which side of a given right triangle is the hypotenuse and which two sides are the legs.</li> <li>→ Identify which variables represent the legs and hypotenuse in the formula <math>a^2 + b^2 = c^2</math>.</li> <li>→ Use the Pythagorean Theorem to determine the length of the hypotenuse of a right triangle when a visual representation is provided.</li> </ul>	<ul style="list-style-type: none"> <li>→ Know and apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world or mathematical problems in two dimensions.</li> </ul>	

## MODULE C | TRANSFORMATIONS

Students will analyze translations, rotations, reflections, and dilations. Next, students will analyze and use similar and congruent figures using transformations.

TN Reveal Lessons: 8.1, 8.2, 8.3, 8.4, 9.1, 9.2, 9.3, 9.4, 9.5

After TCAP - May 26

LESSON	STANDARD	MODULES 8 & 9 INSTRUCTIONAL FOCUS		
		APPROACHING UNDERSTANDING (1-2)	GRADE-LEVEL UNDERSTANDING (3)	EXTENSIVE UNDERSTANDING (4)
8.1 8.2 8.3 8.4 9.1 9.2	<b>8.G.A.1</b> Describe the effect of translations, rotations, reflections, and dilations on two-dimensional figures using coordinates. 8.G.A.1a. Verify informally that lines are taken to lines and determine when line segments are taken to line segments of the same length. 8.G.A.1b. Verify informally that angles are taken to angles of the same measure. 8.G.A.1c. Verify informally that parallel lines are taken to parallel lines. 8.G.A.1d. Make connections between dilations and scale factors.	<ul style="list-style-type: none"> <li>→ Generate figures using coordinates on the coordinate plane.</li> <li>→ Accurately measure angles and line segments.</li> <li>→ Informally define translation, rotation, reflection, and dilation.</li> <li>→ Identify when figures are congruent, similar, or neither.</li> <li>→ Identify if an image and a pre-image represent a translation, rotation, reflection, or dilation.</li> <li>→ Identify which points, lines, and angles in the pre-image map onto which points, lines, and angles in the image after a transformation.</li> <li>→ Translate, rotate, reflect, and dilate a line segment on a coordinate plane.</li> <li>→ Identify when transformations maintain congruence or result in a similarity.</li> </ul>	<ul style="list-style-type: none"> <li>→ Transform a two-dimensional figure on the coordinate plane using translations, rotations, reflections, and dilations.</li> <li>→ Describe the effect of translations, rotations, reflections, and dilations on two-dimensional figures using coordinates.</li> <li>→ Informally verify the transformation used when mapping one figure onto another on the coordinate plane.</li> <li>→ Informally verify that line segments remain congruent after translations, rotations, and reflections, but change length after dilations.</li> <li>→ Informally verify that angle measures remain the same after translations, rotations, reflections, and dilations</li> <li>→ Informally verify that parallel lines remain parallel after translations, rotations, reflections, and dilations</li> <li>→ Describe the effect a dilation will have on an image and its coordinates when given the scale factor.</li> <li>→ Use the correct notation when labeling the preimage and image and when</li> </ul>	<ul style="list-style-type: none"> <li>→ Verify and explain the effects of rigid and non-rigid transformations using coordinates and precise mathematical language.</li> <li>→ Compare and contrast the transformations: rotation, reflection, translation, and dilation using precise mathematical vocabulary.</li> </ul>

			describing a transformed figure.	
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