JOHNSON CITY SCHOOLS
ALGEBRA 1 SCOPE AND SEQUENCE SCHOOL YEAR: 2025-2026

The Tennessee Math Standards are addressed throughout Algebra I and are aligned with each unit. In addition, ACT standards are aligned with each chapter. Standards that are major works of the grade are bolded and the Instructional Focus Documents were highly utilized in writing Learning and Performance Goals.

The following Standards for Mathematical Practice and Literacy Skills for Mathematical Proficiency will be addressed throughout the course.

Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Literacy Skills for Mathematical Proficiency

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

CHAPTER 1: SOLVING LINEAR EQUATIONS			
Chapter Learning Target: Understand solving linear equations			**Length of Chapter:** 14 days
LESSON	**LEARNING TARGETS**	**TENNESSEE ACADEMIC STANDARDS**	**ASSESSMENTS**
1.1 Solving Simple Equations	Write and solve one-step linear equations.	• **A1.N.Q.A.1** Use units as a way to understand real-world problems. (1.3) • **A1.N.Q.A.1b** Use appropriate quantities in formulas, converting units as necessary. (1.3) • **A1.N.Q.A.1c** Define and justify appropriate quantities within a context for the purpose of modeling. (1.3) • **A1.N.Q.A.1d** Choose an appropriate level of accuracy when reporting quantities. (1.4) • **A1.A.SSE.A.1b** Interpret complicated expressions by viewing one or more of their parts as a single entity. (1.5) • **A1.A.CED.A.1** Create equations and inequalities in one variable and use them to solve problems in a real-world context. (1.1, 1.2, 1.5, 1.6) • **A1.A.CED.A.4** Rearrange formulas to isolate a quantity of interest using algebraic reasoning. (1.7) • **A1.A.REI.A.1** Understand solving equations as a process of reasoning and explain the reasoning. Construct a viable argument to justify a solution method. (1.1, 1.2, 1.5, 1.6) • **A1.A.REI.B.2** Solve linear and absolute value **equations** and inequalities in one variable. (1.1, 1.2, 1.5, 1.6) • **A1.A.REI.B.2a** Solve linear **equations** and inequalities, including compound inequalities, in one variable. Represent solutions algebraically and graphically. (1.1, 1.2, 1.5) • **A1.A.REI.B.2b** Solve absolute value **equations** and inequalities in one variable. Represent solutions algebraically and graphically. (1.6)	At the conclusion of the chapter, students will be evaluated through a common summative assessment. Task(s): Greetings Task (1-5) by Algebra Formative Assessments by The Charles A. Dana Center at The University of Texas at Austin. ACT Standard(s): N404, A301, A302, A303, A401, A402, AF401, AF402, A502, AF501, A601, A606
1.2 Solving Multi-Step Equations	Write and solve multi-step linear equations.		
1.3 Modeling Quantities	Use proportional reasoning and analyze units when solving problems		
1.4 Accuracy with Measurements	Choose an appropriate level of accuracy when calculating with measurements.		
1.5 Solving Equations with Variables on Both Sides	Write and solve equations with variables on both sides.		
1.6 Solving Absolute Value Equations	Write and solve equations involving absolute value.		
1.7 Rewriting Equations and Formulas	Solve literal equations for given variables.		

CHAPTER 2: SOLVING LINEAR INEQUALITIES			
Chapter Learning Target: Understand solving linear equations			**Length of Chapter:** 11 days
LESSON	**LEARNING TARGETS**	**TENNESSEE ACADEMIC STANDARDS**	**ASSESSMENTS**
2.1 Writing and Graphing Inequalities	Write inequalities and represent solutions of inequalities on number lines.	• **A1.A.SSE.A.1a** Interpret parts of an expression, such as terms, factors, and coefficients. (2.1) • **A1.A.CED.A.1** Create equations and **inequalities** in one variable and use them to solve problems in a real-world context. (2.1, 2.2, 2.3, 2.4, 2.5, 2.6) • **A1.A.REI.B.2** Solve linear and absolute value equations and **inequalities** in one variable. (2.2, 2.3, 2.4, 2.5, 2.6) • **A1.A.REI.B.2a** Solve linear equations and **inequalities**, including **compound inequalities**, in one variable. Represent solutions algebraically and graphically. (2.2, 2.3, 2.4, 2.5) • **A1.A.REI.B.2b** Solve absolute value equations and **inequalities** in one variable. Represent solutions algebraically and graphically. (2.6)	At the conclusion of the chapter, students will be evaluated through a common summative assessment. Task(s): Shopping Task by Algebra Formative Assessments by The Charles A. Dana Center at The University of Texas at Austin. ACT Standard(s): A405, A503, A504, A602, A603, A701
2.2 Solving Inequalities Using Addition or Subtraction	Write and solve inequalities using addition or subtraction.		
2.3 Solving Inequalities Using Multiplication or Division	Write and solve inequalities using multiplication or division.		
2.4 Solving Multi-Step Inequalities	Write and solve multi-step inequalities.		
2.5 Solving Compound Inequalities	Write and solve compound inequalities.		
2.6 Solving Absolute Value Inequalities	Write and solve inequalities involving absolute value.		

CHAPTER 3: GRAPHING LINEAR FUNCTIONS			
Chapter Learning Target: Understand graphing linear functions.			**Length of Chapter:** 18 days
LESSON	**LEARNING TARGETS**	**TENNESSEE ACADEMIC STANDARDS**	**ASSESSMENTS**
3.1 Functions	Understand the concept of a function.	• **A1.A.CED.A.2** Create equations in two variables to represent relationships between quantities and use them to solve problems in a real-world context. Graph equations with two variables on coordinate axes with labels and scales, and use the graphs to make predictions. (3.4, 3.5, 3.6, 3.7, 3.8) • **A1.A.REI.D.5** Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). (3.3) • **A1.F.IF.A.1** Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then *f(x)* denotes the output of f corresponding to the input x. The graph of *f* is the graph of the equation *y = f((x)*. (3.1, 3.4) • **A1.F.IF.A.2a** Use function notation to evaluate functions for inputs in their domains, including functions of two variables. (3.4) • **A1.F.IF.A.2b** Interpret statements that use function notation in terms of a context. (3.4) • **A1.F.IF.A.3** Understand geometric formulas as functions. (3.1) • **A1.F.IF.B.4** For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. (3.2, 3.6) • **A1.F.IF.B.5** Relate the domain of a function to its graph and, where applicable, to the context of the function it models. (3.3, 3.8) • **A1.F.IF.C.7** Graph functions expressed algebraically and show key features of the graph by hand and using technology. (3.4, 3.5, 3.6, 3.7, 3.8) • **A1.F.IF.C.9a** Compare properties of two different functions. Functions may be of different types and/or represented in different ways. (3.2, 3.4) • **A1.F.BF.B.2** Identify the effect on the graph of replacing *f(x)* by *f(x) + k*, *kf (x)*, *f(kx)*, and *f(x + k)* for specific values of k (both positive and negative); find the value of k given graphs. **(Linear/Absolute Value)** (3.7, 3.8)	At the conclusion of the chapter, students will be evaluated through a common summative assessment. Task(s): The 600-Meter Race Task by Algebra Formative Assessments by The Charles A. Dana Center at The University of Texas at Austin. ACT Standard(s): F401, A406, AF403, AF503, F505, F506, F507, F511, AF603, AF604
3.2 Characteristics of Functions	Describe characteristics of functions.		
3.3 Linear Functions	Identify and graph linear functions.		
3.4 Function Notation	Understand and use function notation.		
3.5 Graphing Linear Equations in Standard Form	Graph and interpret linear equations written in standard form.		
3.6 Graphing Linear Equations in Slope-Intercept Form	Find the slope of a line and use slope-intercept form.		
3.7 Transformations of Linear Functions	Graph transformations of linear functions.		
3.8 Graphing Absolute Value Functions	Graph absolute value functions.		

CHAPTER 4: WRITING LINEAR FUNCTIONS			
Chapter Learning Target: Understand writing linear functions.			**Length of Chapter:** 14 days
LESSON	**LEARNING TARGETS**	**TENNESSEE ACADEMIC STANDARDS**	**ASSESSMENTS**
4.1 Writing Equations in Slope-Intercept Form	Write equations of lines in slope-intercept form.	• **A1.A.CED.A.2** Create equations in two variables to represent relationships between quantities and use them to solve problems in a real-world context. Graph equations with two variables on coordinate axes with labels and scales, and use the graphs to make predictions. (4.1, 4.2, 4.3, 4.7) • **A1.F.IF.B.5** Relate the domain of a function to its graph and, where applicable, to the context of the function it models. (4.7) • **A1.F.IF.C.7** Graph functions expressed algebraically and show key features of the graph by hand and using technology. (4.7) • **A1.F.BF.A.1a** Determine steps for calculation, a recursive process, or an explicit expression from a context. (4.1, 4.2 4.6) • **A1.F.LE.A.1b** Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. (4.1, 4.2) • **A1.F.LE.A.2** Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs. (4.1, 4.2, 4.3, 4.6) • **A1.F.LE.B.3** Interpret the parameters in a **linear** or exponential function in terms of a context. (4.4, 4.5) • **A1.S.ID.B.4** Represent data from two quantitative variables on a scatter plot, and describe how the variables are related. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. (4.4, 4.5) • **A1.S.ID.C.5** Interpret the rate of change and the constant term of a linear model in the context of data. (4.4, 4.5) • **A1.S.ID.C.6** Use technology to compute the correlation coefficient of a linear model; interpret the correlation coefficient in the context of the data. (4.5) • **A1.S.ID.C.7** Explain the differences between correlation and causation. Recognize situations where an additional factor may be affecting correlated data. (4.5)	At the conclusion of the chapter, students will be evaluated through a common summative assessment. Task(s): Cheerios Lab from Larissa Trivette ACT Standard(s): A406, AF403, A502, A514 F503, AF503, A601, F603, AF603, G510
4.2 Writing Equations in Point-Slope Form	Write equations of lines in point-slope form.		
4.3 Writing Equations of Parallel and Perpendicular Lines	Recognize and write equations of parallel and perpendicular lines.		
4.4 Scatter Plots and Lines of Fit	Use scatter plots and lines of fit to describe relationships between data.		
4.5 Analyzing Lines of Fit	Analyze lines of fit and find lines of best fit.		
4.6 Arithmetic Sequences	Understand the concept of arithmetic sequences.		
4.7 Piecewise Functions	Graph and write piecewise functions.		

CHAPTER 5: SOLVING SYSTEMS OF LINEAR EQUATIONS			
Chapter Learning Target: Understand solving systems of linear equations.			**Length of Chapter:** 12 days
LESSON	**LEARNING TARGETS**	**TENNESSEE ACADEMIC STANDARDS**	**ASSESSMENTS**
5.1 Solving Systems of Linear Equations by Graphing	Solve linear systems by graphing.	• **A1.A.CED.A.3** Create individual and systems of equations and/or inequalities to represent constraints in a contextual situation, and interpret solutions as viable or non-viable. (5.1, 5.2, 5.3, 5.4, 5.5., 5.6, 5.7) • **A1.A.REI.C.4** Write and solve a system of linear equations in a real-world context. (5.1, 5.2, 5.3, 5.4) • **A1.A.REI.D.6** Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$. Find approximate solutions by graphing the functions or making a table of values, using technology when appropriate. (5.5) • **A1.A.REI.D.7** Graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. (5.7)	At the conclusion of the chapter, students will be evaluated through a common summative assessment. Task(s): Cash Box Task-Illustrative Mathematics-website ACT Standard(s): A604, AF702
5.2 Solving Systems of Linear Equations by Substitution	Solve linear systems by substitution.		
5.3 Solving Systems of Linear Equations by Elimination	Solve linear systems by elimination.		
5.4 Solving Special Systems of Linear Equations	Solve linear systems with different numbers of solutions.		
5.5 Solving Equations by Graphing	Solve equations by graphing.		
5.6 Graphing Linear Inequalities in Two Variables	Graph linear inequalities in two variables.		
5.7 Systems of Linear Inequalities	Graph and write systems of linear inequalities.		

CHAPTER 6: EXPONENTIAL FUNCTIONS AND SEQUENCES			
Chapter Learning Target: Understand exponential functions and sequences.			**Length of Chapter:** 12 days
LESSON	**LEARNING TARGETS**	**TENNESSEE ACADEMIC STANDARDS**	**ASSESSMENTS**
6.1 Properties of Exponents	Write equivalent expressions involving powers.	• **A1.A.SSE.A.1b** Interpret complicated expressions by viewing one or more of their parts as a single entity. (6.1, 6.3) • **A1.A.CED.A.2** Create equations in two variables to represent relationships between quantities and use them to solve problems in a real-world context. Graph equations with two variables on coordinate axes with labels and scales, and use the graphs to make predictions. (6.2, 6.3) • **A1.F.IF.C.7** Graph functions expressed algebraically and show key features of the graph by hand and using technology. (6.2, 6.3) • **A1.F.BF.A.1a** Determine steps for calculation, a recursive process, or an explicit expression from a context. (6.2, 6.3, 6.4, 6.5) • **A1.F.LE.A.1a** Know that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals. (6.2) • **A1.F.LE.A.1c** Recognize situations in which a quantity grows or decays by a constant factor per unit interval relative to another. (6.3) • **A1.F.LE.A.2** Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs. (6.2, 6.3, 6.4, 6.5) • **A1.S.ID.B.4** Represent data from two quantitative variables on a scatter plot, and describe how the variables are related. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. (6.2)	At the conclusion of the chapter, students will be evaluated through a common summative assessment. Task(s): M&M Lab-Exp. Growth and Decay Task from U. Fletcher ACT Standard(s): A512, F510, N605 A601, F503, F603, AF603, F702, F703
6.2 Exponential Functions	Graph and write exponential functions.		
6.3 Exponential Growth and Decay	Write and graph exponential growth and decay functions.		
6.4 Geometric Sequences	Identify, extend, and graph geometric sequences.		
6.5 Recursively Defined Sequences	Write terms of recursively defined sequences and write recursive rules for sequences.		

CHAPTER 7: POLYNOMIAL EQUATIONS AND FACTORING			
Chapter Learning Target: Understand polynomial equations and factoring.			**Length of Chapter:** 14 days
LESSON	**LEARNING TARGETS**	**TENNESSEE ACADEMIC STANDARDS**	**ASSESSMENTS**
7.1 Adding and Subtracting Polynomials	Add and subtract polynomials.	• **A1.A.SSE.A.1a** Interpret parts of an expression, such as terms, factors, and coefficients. (7.1, 7.3) • **A1.A.APR.A.1** Add, subtract, and multiply polynomials. Use these operations to demonstrate that polynomials form a closed system that adhere to the same properties of operations as the integers. (7.1, 7.2, 7.3) • **A1.A.REI.A.1** Understand solving equations as a process of reasoning and explain the reasoning. Construct a viable argument to justify a solution method. (7.4) • **A1.A.REI.B.3a** Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, knowing and applying the quadratic formula, and factoring, as appropriate to the initial form of the equation. Recognize when a quadratic equation has solutions that are not real numbers. (7.4, 7.5, 7.6, 7.7, 7.8)	At the conclusion of the chapter, students will be evaluated through a common summative assessment. Task(s): ACT Standard(s): A402, A404, A505, A508, F501
7.2 Multiplying and Dividing Polynomials	Multiply and divide polynomials.		
7.3 Special Products of Polynomials	Use patterns to find products of polynomials.		
7.4 Solving Polynomial Equations in Factored Form	Use patterns to find products of polynomials.		
7.5 Factoring $x^2 + bx + c$	Factor polynomials of the form $x^2 + bx + c$.		
7.6 Factoring $ax^2 + bx + c$	Factor polynomials of the form $ax^2 + bx + c$.		
7.7 Factoring Special Products	Recognize and factor special products.		
7.8 Factoring Polynomials Completely	Factor a polynomial by grouping and recognize when a polynomial is factored completely.		

CHAPTER 8: GRAPHING QUADRATIC FUNCTIONS			
Chapter Learning Target: Understand graphing quadratic functions.			**Length of Chapter:** 13 days
LESSON	**LEARNING TARGETS**	**TENNESSEE ACADEMIC STANDARDS**	**ASSESSMENTS**
8.1 Graphing $f(x) = ax^2$	Graph and describe functions of the form $f(x) = ax^2$.	• **A1.A.CED.A.2** Create equations in two variables to represent relationships between quantities and use them to solve problems in a real-world context. Graph equations with two variables on coordinate axes with labels and scales, and use the graphs to make predictions. (8.1, 8.2, 8.3, 8.4, 8.5) • **A1.F.IF.B.4** For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. (8.1, 8.3, 8.4) • **A1.F.IF.B.6** Calculate and interpret the average rate of change of a function (presented algebraically or as a table) over a specified interval. Estimate and interpret the rate of change from a graph. (8.6) • **A1.F.IF.C.7** Graph functions expressed algebraically and show key features of the graph by hand and using technology. (8.1, 8.2, 8.3, 8.4, 8.5) • **A1.F.IF.C.8a** Rewrite quadratic functions to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a real-world context. (8.5) • **A1.F.IF.C.9a** Compare properties of two different functions. Functions may be of different types and/or represented in different ways. (8.3, 8.6) • **A1.F.IF.C.9b** Compare properties of the same function on two different intervals or represented in two different ways. (8.3, 8.6) • **A1.F.BF.A.1a** Determine steps for calculation, a recursive process, or an explicit expression from a context. (8.4, 8.5, 8.6) • **A1.F.BF.B.2** Identify the effect on the graph of replacing *f(x)* by *f(x) + k*, *kf(x), f(kx),* and *f(x + k)* for specific values of *k* (both positive and negative); find the value of *k* given graphs. (8.1, 8.2, 8.4)	At the conclusion of the chapter, students will be evaluated through a common summative assessment. Task(s): ACT Standard(s): F509, F601, AF604
8.2 Graphing $f(x) = ax^2 + c$	Graph and describe functions of the form $f(x) = ax^2 + c$.		
8.3 Graphing $f(x) = ax^2 + bx + c$	Graph and describe functions of the form $f(x) = ax^2 + bx + c$.		
8.4 Graphing $f(x) = a(x - h)^2 + k$	Graph and describe functions of the form $f(x) = a(x - h)^2 + k$.		
8.5 Using Intercept Form	Graph and use functions in intercept form.		
8.6 Comparing Linear, Exponential, and Quadratic Functions	Compare the characteristics of linear, exponential, and quadratic functions.		

<table>
<tr><th colspan="4">CHAPTER 9: SOLVING QUADRATIC EQUATIONS</th></tr>
<tr><td colspan="4">Chapter Learning Target: Understand solving quadratic equations. Length of Chapter: 13 days</td></tr>
<tr><th>LESSON</th><th>LEARNING TARGETS</th><th>TENNESSEE ACADEMIC STANDARDS</th><th>ASSESSMENTS</th></tr>
<tr><td>9.1 Properties of Radicals (preparing)</td><td>• Use properties of radicals to write equivalent expressions.</td><td rowspan="5">• A1.A.CED.A.1 Create equations and inequalities in one variable and use them to solve problems in a real-world context. (9.3, 9.4)
• A1.A.CED.A.4 Rearrange formulas to isolate a quantity of interest using algebraic reasoning. (9.1, 9.3)
• A1.A.REI.B.3a Solve quadratic equations by inspection (e.g., for x2 = 49), taking square roots, knowing and applying the quadratic formula, and factoring, as appropriate to the initial form of the equation. Recognize when a quadratic equation has solutions that are not real numbers. (9.1, 9.3, 9.4)
• A1.A.REI.B.3b Solve quadratic inequalities using the graph of the related quadratic equation. (9.5)
• A1.F.IF.B.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. (9.2)
• A1.F.IF.C.7 Graph functions expressed algebraically and show key features of the graph by hand and using technology. (9.2)
• A1.S.ID.B.4 Represent data from two quantitative variables on a scatter plot, and describe how the variables are related. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. (9.2)</td><td rowspan="5">At the conclusion of the chapter, students will be evaluated through a common summative assessment.

Task(s): Quadratic Regression Activity Using Cheerios and Circular Lids

ACT Standard(s):
F401, A506, A507, A509, N604, A601, A605, A702, AF603</td></tr>
<tr><td>9.2 Solving Quadratic Equations by Graphing</td><td>• Use graphs to solve quadratic equations and find zeros of functions.</td></tr>
<tr><td>9.3 Solving Quadratic Equations Using Square Roots</td><td>• Solve quadratic equations using square roots.</td></tr>
<tr><td>9.4 Solving Quadratic Equations Using the Quadratic Formula</td><td>• Use the Quadratic Formula and its discriminant to solve and analyze quadratic equations.</td></tr>
<tr><td>9.5 Quadratic Inequalities</td><td>• Solve quadratic inequalities in one variable.</td></tr>
</table>

CHAPTER 10: DATA ANALYSIS AND DISPLAYS			
Chapter Learning Target: Understand data.			**Length of Chapter:** 9 days
LESSON	**LEARNING TARGETS**	**TENNESSEE ACADEMIC STANDARDS**	**ASSESSMENTS**
10.1 Measures of Center and Variation	Find measures of center and variation of a data set	• **A1.N.Q.A.1a** Choose and interpret the scale and the origin in graphs and data displays. (10.4) • **A1.S.ID.A.1** Use measures of center to solve real-world and mathematical problems. (10.1) • **A1.S.ID.A.2** Use statistics appropriate to the shape of the data distribution to compare center (mean, median, and/or mode) and spread (range, interquartile range) of two or more different data sets. (10.3) • **A1.S.ID.A.3** Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points. (10.1, 10.2, 10.3)	At the conclusion of the chapter, students will be evaluated through a common summative assessment. Task(s): ACT Standard(s): S502, S505, S506, S701, S702, S705
10.2 Box-and-Whisker Plots	Make and interpret box-and-whisker plots for data sets.		
10.3 Shapes of Distributions	Describe and compare shapes of distributions.		
10.4 Choosing a Data Display	Use appropriate data displays to represent situations.		