

SUMMER SCHOOL TEACHER GUIDE



Algebra I

**Summer School
Table of Contents**

Semester 1				
Day	Grade Results Title	Lesson	Standard	Page
1	Solving Equations	1	A1.A.REI.B.2	4
2	Construct a Viable Argument	2	A1.A.REI.A.1	6
3	Solving Literal Equations	3	A1.A.REI.B.2a	8
4	Solving Systems of Linear Equations	4	A1.A.REI.C.4	10
5	Linear Inequalities	5	A1.A.REI.D.7a	12
6	Formalizing Relations and Functions	6	A1.F.IF.A.1	15
7	Input and Output Values of Functions and Interpretation	7	A1.F.IF.A.2	18
8	Domain of a Function	8	A1.F.IF.B.4	20
9	Relationship Between two Quantities and Key Features of Graphs and Tables	9	A1.F.IF.B.3	22
10	Post-Test Review & Post-Test	-	-	24
Semester 2				
Day	Grade Results Title	Lesson	Standard	Page
11	Interpreting Linear Function	1	A1.F.LE.A.1	26
12	Interpret Rate of Change	2	A1.F.LE.A.1bc	28
13	Exponential Growth and Decay	3	A1.F.LE.A.1bc	30
14	Addition and Subtraction of Polynomials	4	A1.A.APR.A.1	32
15	Multiplying Polynomials	5	A1.A.APR.A.1	34
16	Graph Linear and Quadratic Functions – Slope Intercepts	6	A1.F.IF.C.6a	36
17	Solving Quadratic Equation	7	A1.A.REI.B.3	39
18	Solving Quadratic Equations by Factoring	8	A1.A.REI.B.3	41
19	Deriving the Quadratic Formula	9	A1.A.REI.B.3	43
20	Post-Test Review & Post-Test	-	-	45

Summer School Teacher Guide

The Summer High School Program will be **20 days** for full credit and **10 days** for semester/half (½) credit). The first Semester will be **days 1-10** and Second Semester will be **days 11-20**. Breakdown of days will have the following semester/half (½) credit:

- Nine (9) days of daily lessons
- One (1) day post-test review and post-test

All students and staff will use Grade Results for their summer curriculum. Each lesson will open daily, and students cannot work ahead; however, students can work on previously opened lessons. per semester. Students can retake a daily post-test 3 times before it locks. If a student needs to retake a daily lesson post-test for a 4th time, the teacher will have to open the post-test again. Teachers should not delete any prior lesson post-test. Grade Results will post the highest grade from each student's lesson post-test.

HS Classroom Schedule – Time below is an *approximate* breakdown of time.

- **Attendance in PowerSchool** – 5 minutes
- **Lesson Introduction (I Do)** – 5 minutes
- **Lesson Activities/Supplemental - (We Do)** – 60 minutes.
- **Break** – 10 Minutes (Site Administrator will work with teachers on breaks)
- **Teacher Lesson Review** – 5 minutes
- **Independent Work** – Student Lesson Review*/Post-test (They Do) – 40 minutes
- **Closing/Wrap Up**– 5 minutes
- **Total Time: 2 hours 10 minutes**

***Lesson Review** – Students will review lessons for essential knowledge/information prior to the daily test.

The following will be used within **Grade Results**:

- Lessons with Content Area, Videos, and Activities
- Supplemental Teacher Resources App– Some lessons will have a Supplemental resource (example – Flocabulary)
- Post-Test – Each lesson will have a daily post-test.

Graded Work – The Post-Test will be the daily graded work. Graded work is automatically calculated by the Grade Results Software.

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 1

Topic/Lesson Title & Grade Results #: Lesson #1 - Solving Equations

Objective(s)

- Students will be able to solve linear equations in one variable.
- Students will be able to solve linear equations with letters as coefficients.

Guiding Question(s)

- What operations are being performed on the variable in the problem?
- What operations should be performed to isolate the variable and solve the problem?

TN Curriculum Standard(s)

- A1.A.REI.B.2 - Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil or notes in Grade Results

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Additional Teacher Resources: None

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students stay focused and engaged in learning.

Attendance in PowerSchool – 5 minutes

Key Vocabulary/Terms - 5 Minutes

Slide 23 - As a whole group, Define and discuss the meaning of the vocabulary words

- Inverse Operation: The operation that reverses the effect of another operation.
- Linear Equation: An equation of degree 1.
- Multi-Step Linear Equation: An equation that can be solved after multiple steps.
- One-Step Linear Equation: An equation that can be solved in a step.
- Solution of an Equation: The values the variables can take make the equation true.
- Variable: A letter or symbol that represents an unknown value.

Lesson Introduction (I Do) – 40 minutes

- **Slide 1** - Student will state objectives.
- **Slide 2** - The teacher will introduce linear equations and go over some examples of linear equations vs non-linear equations.
- **Slide 3** - The teacher will lead a discussion on how to solve linear equations by isolating the variable.
- **Slides 4&5** - The teacher will go over inverse operations.
- **Slide 6** - The teacher will go over the properties of equality. Roll over the tabs to view the different equality properties with examples.
- **Slide 7** - Solving One-Step Linear Equations. The teacher will model example 1.
- **Slide 8** -As a whole group, complete the activity on slide 8. Discuss.
- **Slide 9** - Solving One-Step Linear Equations. The teacher will model example 2.
- **Slide 10** - As a whole group, complete the activity on slide 8. Discuss
- **Slide 11** -Solving Multi-Step Linear Equations - The teacher will model example 3 (slide 11). The teacher will lead a discussion on how students can check the solution. Watch the video.

- **Slide 12** - The teacher will model example 4 (word problem). Watch the video.
- **Slide 13** - As a whole group, complete the activity. Discuss.
- **Slide 14** - Solving Equations Involving Fractions. The teacher will model example 5.
- **Slide 15** - As a whole group, complete the activities. Discuss.
- **Slide 16** - Solving Equations with Variable in the Denominator - Click on the steps involved in solving equations containing fractions.
- **Slide 17** - Solving Equations with variables in the denominator. The teacher will model example 6.
- **Slide 18** - As a whole group, complete the activity. Discuss.
- **Slide 19** - Solving Linear Equations with Letters as Coefficients. The teacher will model example 7.
- **Slide 20** - As a whole group, complete the activities. Discuss.
- **Slide 21** -As a whole group, complete the activities. Discuss.

Lesson Activities (We Do) – 15 minutes

All activities are within the grade results lesson and should be completed as they appear in the lesson. As a whole group, complete the Practice Activities. These activities are listed in the slides above.

Supplemental – N/A

Lesson Review – 10 minutes

Slide 22 - Summarize the lesson with a lesson review in Grade Results. Students can ask questions or review previous slides for a better understanding of the material prior to moving on to the independent work.

- Addition and subtraction are inverse operations.
- Multiplication and division are inverse operations.
- If any mathematical operation is performed to one side of the equation, it should be performed to the other side as well. Only then, the equation will be balanced.
- To solve an equation, isolate the variable on one side of the equation using the inverse operations.
- Have students review the slides and their notes to prepare for the Post-test.

Independent Work – Posttest (They Do) – 40 minutes

- Explain that students will work independently to complete the post-test. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson. All students are required to complete student activities as part of their class assignments.

Closing/Wrap-Up – 5 minutes

Take a moment to reflect on the lesson of the day and pick one of the following closure activities as time permits.

Examples:

- Repeat the Lesson Review
- Use an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?
- Ask students to explain the relevance of the concept to their life or how they might use it.

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 2

Topic/Lesson Title & Grade Results #: Lesson #2 - Construct a Viable Argument

Objective(s)

- Students will be able to explain the steps involved in solving a simple equation.
- Students will be able to justify the solution steps of an equation using properties of equality.
- Students will be able to solve a real-world problem using linear equations.

Guiding Question(s)

- How does the result change when the value of the variable is changed?
- What words or symbols indicate which operation?
- How can mathematical symbols model verbal expressions?
- How can you analyze, model, and solve mathematical situations using algebraic equations?
- How can an understanding of the number properties help you solve equations that can represent real-world situations?

TN Curriculum Standard(s)

- A1.A.REI.A.1 - Explain each step in solving an equation as follows from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil, or notes in Grade Results

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students stay focused and engaged in learning.

Attendance in PowerSchool – 5 minutes

Key Vocabulary/Terms - 5 minutes

Slide 15 - As a whole group, Define and discuss the meaning of the vocabulary words

- Constant: A fixed value.
- Coefficient: Numerical or constant quantity placed before and multiplying the variable in an algebraic expression.
- Equation: A mathematical statement that asserts the equality of two expressions.
- Variable: A letter or a symbol that represents an unknown value.

Lesson Introduction (I Do) – 30 minutes

- **Slide 1** – The students will state the objectives
- **Slide 2** – The teacher will compare balancing a scale to balancing an equation while solving that equation. Play the video.
- **Slide 3** – The teacher will discuss what it means to solve an equation and give an example of how to do so. Play the video. As a whole group, complete the activity at the bottom of slide 3. Discuss.
- **Slide 4** – The teacher will discuss the different types of solutions to equations and give examples of how each of those solutions are presented. As a whole group, complete the activity at the bottom of slide 4. Discuss.
- **Slide 5** – Play the video. The teacher will model example 1. As a whole group, complete the activity on slide 5. Discuss.
- **Slide 6** – As a whole group, complete the activity. Discuss.

- **Slide 7-** The teacher will discuss the properties of equality. Complete and discuss the activity at the bottom of the slide as a whole group.
- **Slide 8** – The teacher will discuss translating verbal phrases into algebraic expressions. Complete and discuss the activity at the bottom of the slide as a whole group.
- **Slide 9** – The teacher will model example 2. As a whole group, complete and discuss the activity. The teacher will model the remainder of the example.
- **Slide 10** – Play the video. The teacher will model example 3. As a whole group, complete and discuss the activities on the page.
- **Slide 11** – The teacher will model example 4. Complete and discuss the activity on the bottom of the page as a whole group.
- **Slide 12** – The teacher will model example 5. As a whole group, complete and discuss the activities on the page.
- **Slide 13** – As a whole group, complete the video. Discuss.

Lesson Activities (We Do) – 15 minutes

- All activities are within the grade results lesson and should be completed as they appear in the lesson. As a whole group, complete the Practice Activities. These activities are listed in the slides above.

Supplemental – 10 minutes

- Algebra’scool video in Grade Results

Additional Teacher Resources: None

Lesson Review – 10 minutes

Slide 14 - Summarize the lesson with a lesson review in Grade Results. Students can ask questions or review previous slides for a better understanding of the material prior to moving on to the independent work.

- To solve a linear equation of one variable, use properties of equality such as addition, subtraction, multiplication, and division.
- If solving a linear equation ends up with a contradictory equation, then the equation is said to have no solution.
- If solving a linear equation ends up with a true statement irrespective of the variable, then the equation is said to have an infinite solution.
- To justify the solution of an equation, plug the solution into the equation and check whether the equality is true.

Independent Work – Posttest (They Do) – 40 minutes

- Explain that students will work independently to complete the post-test. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson. All students are required to complete student activities as part of their class assignments.

Closing/Wrap-Up – 5 minutes

Take a moment to reflect on the lesson of the day and pick one of the following closure activities as time permits.

Examples:

- Repeat the Lesson Review,
- Use an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?
- Ask students to explain the relevance of the concept to their life or how they might use it.

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 3

Topic/Lesson Title & Grade Results #: Lesson #3 - Solving Literal Equations

Objective(s)

- Students will be able to solve literal equations for specified variables.

Guiding Question(s):

- How can you solve linear equations and inequalities in one variable, including equations with coefficients represented by letters?
- How can you rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations?

TN Curriculum Standard(s):

- A1.A.REI.B.2a - Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil, or notes in Grade Results

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students stay focused and engaged in learning.

Attendance in PowerSchool – 5 minutes

Key Vocabulary/Terms – 5 minutes

Slide 13 - As a whole group, Define and discuss the meaning of the vocabulary words

- Literal Equation: An equation with more than one variable.
- Variable: A symbol or letter that stands for an unknown quantity

Lesson Introduction (I Do) – 30 minutes

- **Slide 1** – The students will state the objectives.
- **Slide 2** – The teacher will discuss literal equations and how they are composed. Play the video.
- **Slide 3** – The teacher will discuss how to solve literal equations and model example 1. Complete and discuss the activity at the bottom of the slide as a whole group. Play the video if time permits.
- **Slide 4** – The teacher will model example 2. As a whole group, complete and discuss the activities on the slide.
- **Slide 5** – The teacher will model example 3. Complete and discuss the activity at the bottom of the slide as a whole group.
- **Slide 6** – The teacher will model example 4. Complete and discuss the activity at the bottom of the slide as a whole group. Play the video if time permits.
- **Slide 7** – The teacher will model example 5. As a whole group, complete and discuss the activities on the slide. Play the video if time permits.
- **Slide 8** – The teacher will model example 6.
- **Slide 9** – The teacher will model example 7. As a whole group, complete and discuss the activities on the slide.
- **Slides 10-11** – Complete and discuss the activities as a whole group.

Lesson Activities (We Do) – 15 minutes

- All activities are within the grade results lesson and should be completed as they appear in the lesson. As a whole group, complete the Practice Activities. These activities are listed in the slides above.

Supplemental – 10 minutes

- Mathispower4u videos on Grade Results

Additional Teacher Resources: None

Lesson Review – 10 minutes

Slide 12 - Summarize the lesson with a lesson review in Grade Results. Students can ask questions or review previous slides for a better understanding of the material prior to moving on to the independent work.

- A literal equation contains more than one variable.
- Literal equations are usually formulas or expressions which contain other variables too.

Independent Work – Posttest (They Do) – 40 minutes

- Explain that students will work independently to complete the post-test. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson. All students are required to complete student activities as part of their class assignments.

Closing/Wrap-Up – 5 minutes

Take a moment to reflect on the lesson of the day and pick one of the following closure activities as time permits.

Examples:

- Repeat the Lesson Review,
- Use an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?
- Ask students to explain the relevance of the concept to their life or how they might use it.

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 4

Topic/Lesson Title & Grade Results #: Lesson #4 – Solving Systems of Linear Equations

Objective(s)

- Students will be able to list the types of solutions of a system of linear equations.
- Students will be able to solve a system of equations by elimination method.

Guiding Question(s)

- What does the number of solutions (none, one, or infinite) of a system of linear equations represent?
- What are the advantages and disadvantages of solving a system of linear equations graphically versus algebraically?
- How can systems of equations be used to represent situations and solve problems?

TN Curriculum Standard(s)

- A1.A.REI.C.4 - Write and solve a system of linear equations in context.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil or notes in Grade Results

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students stay focused and engaged in learning.

Attendance in PowerSchool – 5 minutes

Key Vocabulary/Terms – 5 minutes

Slide 12 - As a whole group, Define and discuss the meaning of the vocabulary words

- Coefficient: The number that appears along with the variable.
- Coordinate Plane: A two-dimensional surface on which points are plotted and located by their x- and y-coordinates.
- Linear Equation: An algebraic equation in which the highest exponent of the variable or variables is one.
- System of Linear Equations: A collection of linear equations involving the same set of variables.

Lesson Introduction (I Do) - 40 minutes

- **Slide 1** – The students will state the objectives.
- **Slide 2** – The teacher will discuss real-world applications of linear equations. The teacher will give examples of linear equations.
- **Slide 3** – The teacher will discuss systems of equations and their solutions. Play the video.
- **Slide 4** – The teacher will discuss how to solve systems of linear equations. The teacher will discuss the steps used to solve a system of linear equations using elimination.
- **Slide 5** – The teacher will model example 1. As a group, complete and discuss the activity. Play the video.
- **Slide 6** – The teacher will model example 2. As a group, complete and discuss the activities on the page. Play the video.
- **Slide 7** – The teacher will model example 3. Complete and discuss the activity at the bottom of the slide as a group. Play the video.
- **Slide 8** – The teacher will model example 4. As a group, complete and discuss the activities on the page. Play the video.

- **Slide 9** – As a whole group, complete the activity. Discuss.
- **Slide 10** – As a whole group, complete the activity. Discuss.

Lesson Activities (We Do) – 20 minutes

- All activities are within the grade results lesson and should be completed as they appear in the lesson. As a whole group, complete the Practice Activities. These activities are listed in the slides above.

Supplemental – (optional)

- Four videos in grade results under “supplemental”

Additional Teacher Resources: None

Lesson Review – 5 minutes

Slide 11 - Summarize the lesson with a lesson review in Grade Results. Students can ask questions or review previous slides for a better understanding of the material prior to moving on to the independent work.

- The solution of a system of linear equations can be of three types. They are:
 - One solution
 - Infinitely many solutions
 - No solution
- If the system has exactly one solution, then the equations are said to be independent.
- If the system has infinite solutions, then the equations are said to be dependent.
- If the system of equations has at least one solution, then the system is consistent.
- If the system has no solution, then the system is inconsistent.
- The three different methods of solving a system of linear equations are:
 - Substitution method
 - Elimination method
 - Graphing method
- The coordinates of the intersection point of two equations become the solution to the system of equations.

Independent Work – Posttest (They Do) – 40 minutes

- Explain that students will work independently to complete the post-test. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson. All students are required to complete student activities as part of their class assignments.

Closing/Wrap-Up – 5 minutes

Take a moment to reflect on the lesson of the day and pick one of the following closure activities as time permits.

Examples:

- Repeat the Lesson Review,
- Use an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?
- Ask students to explain the relevance of the concept to their life or how they might use it.

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 5

Topic/Lesson Title & Grade Results #: Lesson #5 – Linear Inequalities

Objective(s)

- **Lesson A**
 - Students will be able to solve multi-step inequalities with rational number coefficients and constants.
 - Students will be able to solve inequalities with variables on both sides of the inequality symbol.
 - Students will be able to solve inequalities using the properties of inequality to justify the steps and the solution.
 - Students will be able to solve verbal problems on inequalities.
- **Lesson B**
 - Students will be able to define inequality.
 - Students will know the standard form of linear inequalities.
 - Students will be able to explain the steps involved in graphing the solution of a system of linear inequalities.
 - Students will be able to solve a system of linear inequalities graphically.

Guiding Question(s)

- **Lesson A**
 - How do you represent relationships between quantities that appear that are not equal?
 - Can inequalities that appear to be different be equivalent?
 - How can you solve inequalities?
- **Lesson B**
 - How do you graph a linear inequality?
 - How do you graph a system of linear inequalities?
 - How do you check if a point is a solution to a system of inequalities?
 - How can we find the maximum or minimum of real-world situations with a system of linear inequalities?

TN Curriculum Standard(s)

- A1.A.REI.D.7a - Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil, or notes in Grade Results

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students stay focused and engaged in learning.

Attendance in PowerSchool – 5 minutes

Key Vocabulary/Terms – 5 minutes

As a whole group, Define and discuss the meaning of the vocabulary words.

- **Lesson A – Slide 15**
 - Inequalities: The condition in which two values are not equal.
 - Solution of inequality: A value or range of values which, when plugged in for the variable, makes the inequality a true statement.

- **Lesson B – Slide 19**
 - Half-plane: A planar region consisting of all points on one side of an infinite straight line, and no points on the other side.
 - Inequality: The relation between two unequal expressions.
 - Linear Inequality: An inequality that involves a linear function.
 - System of Linear Inequalities: A set of two or more inequalities with the same variables.
 - Test Point: A point that determines the region included or not included in an inequality.
 - Variable: A letter or symbol which represents an unknown value.

Lesson Introduction (I Do) – 40 minutes

- **Lesson A**
 - **Slide 1** – The students will state the objectives.
 - **Slide 2** – The teacher will discuss linear inequalities and give examples of linear inequalities.
 - **Slide 3** – As a whole group, complete the activity. Discuss.
 - **Slide 4** – The teacher will discuss the properties of inequality.
 - **Slide 5** – The teacher will model example 1. While modeling example 1, the teacher will discuss the strategies used to solve inequalities and how solving inequalities relate to solving equations.
 - **Slide 6** – The teacher will model examples 2 and 3.
 - **Slide 7** – Play the video (required). As a whole group, complete and discuss the activities on the slide.
 - **Slide 8** – The teacher will model example 4. Complete and discuss the activity at the bottom of the slide as a whole group.
 - **Slide 9** – The teacher will model example 5. Complete and discuss the activity at the bottom of the slide as a whole group.
 - **Slide 10** – The teacher will model example 6. Complete and discuss the activity at the bottom of the slide as a whole group.
 - **Slide 11** – The teacher will model example 7.
 - **Slide 12** – The teacher will model example 8.
 - **Slide 13** – As a whole group, complete the activity. Discuss.
- **Lesson B**
 - **Slide 1** – The students will state the objectives
 - **Slide 2** – The teacher will discuss the use of linear inequalities in real-world situations. Play the video.
 - **Slide 3** – The teacher will discuss inequality symbols. This slide is optional because this material was discussed in Lesson A.
 - **Slide 4** – The teacher will discuss linear inequalities in two variables.
 - **Slide 5** – The teacher will discuss steps to solve linear inequalities in two variables.
 - **Slide 6** – Play the video if time permits.
 - **Slide 7** – The teacher will model example 1. Play the video.
 - **Slide 8** – Play the video.
 - **Slide 9** – As a whole group, complete the activity. Discuss.
 - **Slide 10** – The teacher will model example 2. Play the video.
 - **Slide 11** – Play the video.
 - **Slide 12** – As a whole group, complete the activity. Discuss.
 - **Slide 13** – Play the video.
 - **Slide 14** – The teacher will model example 3. Play the video.
 - **Slide 15** – Play the video.
 - **Slide 16** – The teacher will model interpreting graphs of inequalities.
 - **Slide 17** - As a whole group, complete the activity. Discuss.

Lesson Activities (We Do) – 15 minutes

- All activities are within the grade results lesson and should be completed as they appear in the lesson. As a whole group, complete the Practice Activities. These activities are listed in the slides above.

Supplemental (optional)

- There are supplemental videos in grade results to provide extra support. Click on the tab “Supplemental” within the lesson.

Additional Teacher Resources: None

Lesson Review – 10 minutes

Summarize the lesson with a lesson review in Grade Results. Students can ask questions or review previous slides for a better understanding of the material prior to moving on to the independent work.

- **Lesson A – Slide 14**

To solve inequalities

- Combine the like terms and simplify.
- Isolate the variable terms.
- Isolate the variable.

To graph inequalities

- If the variable is greater than a number, locate the number on the number line using an open dot, and shade the part of the number line to the right of the number.
- If the variable is greater than or equal to a number, locate the number on the number line using a closed dot, and shade the part of the number line to the right of the number.
- If the variable is less than a number, locate the number on the number line using an open dot, and shade the part of the number line to the left of the number.
- If the variable is less than or equal to a number, locate the number on the number line using a closed dot, and shade the part of the number line to the left of the number.

- **Lesson B – Slide 18**

- A system of linear inequalities is a set of linear inequalities with the same variables.
- Linear inequalities in two variables can be represented in any one of the forms as:

$$Ax + By < C$$

$$Ax + By > C$$

$$Ax + By \leq C$$

$$Ax + By \geq C$$

- A solution to a system of linear inequalities is an ordered pair for which all the inequalities in the system are true.
- The graph of a system of linear inequalities is the set of points that represents the solutions of the system.
- When there is no common region, then the system will have no solution.

Independent Work – Posttest (They Do) – 40 minutes

- Explain that students will work independently to complete the post-test. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson. All students are required to complete student activities as part of their class assignments.

Closing/Wrap-Up – 5 minutes

Take a moment to reflect on the lesson of the day and pick one of the following closure activities as time permits.

Examples:

- Repeat the Lesson Review,
- Use an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?
- Ask students to explain the relevance of the concept to their life or how they might use it.

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 6

Topic/Lesson Title & Grade Results #: Lesson #6 – Formalizing Relations and Functions

Objective(s)

- The student will be able to define a relation and how it differs from a function.
- The student will be able to define and understand functions in terms of domain and range.
- The student will be able to represent functions in various contexts.
- The student will be able to determine whether a relation is a function and describe functions.
- The student will be able to describe functional relationships using graphs.

Guiding Question(s):

- What is a relation?
- What is the domain of a relation?
- What is the range of a relation?
- What is a function?
- How can you tell if a relation is a function?
- How can you represent a relation with a mapping diagram?
- How can you represent a relation with a graph?
- What are some real-world examples of relations and functions?

TN Curriculum Standard(s):

- 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 $y = f(x)$.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil or notes in Grade Results

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students stay focused and engaged in learning.

Attendance in PowerSchool – 5 minutes

Key Vocabulary/Terms - 5 minutes

Slide 20 - As a whole group, Define and discuss the meaning of the vocabulary words.

- Function: A relation in which each element in the domain is paired exactly with one element in the range.
- Relation: A set of input and output values, usually represented in ordered pairs.
- Domain: The set of all input values in a relation.
- Range: The set of all output values in a relation.
- Function Rule: An equation that describes the relationship between dependent and independent variables.
- Function Notation: A notation used to represent a function or a relation such as $f(x)$, $g(x)$, etc.
- Vertical line test: A test used to determine if the given relation is a function or not.
- Mapping Diagram: A representation that associates the values in one set to the values in another set using arrows from one set to another.

Lesson Introduction (I Do) – 30 minutes

- **Slide 1** – The students will state the objectives.
- **Slide 2** – The teacher will discuss relations, domains, and range. Play the video. As a whole group, complete and discuss the activity at the bottom of the slide.
- **Slide 3** – The teacher will discuss domain, range, input value, output value, and mapping. Play the video. As a whole group, complete and discuss the activity at the bottom of the slide.
- **Slide 4** – The teacher will discuss relations as functions and what makes a relation a function. As a whole group, complete and discuss the activity at the bottom of the slide.
- **Slide 5** – The teacher will discuss how output values are calculated given the input value. The teacher will discuss dependent and independent variables. As a whole group, complete and discuss the activity at the bottom of the slide.
- **Slide 6** – Play the video if time permits. The teacher will model example 1. As a whole group, complete and discuss the activity at the bottom of the slide.
- **Slide 7** - The teacher will model example 2. As a whole group, complete and discuss the activity.
- **Slide 8** – The teacher will discuss different representations of functions. Roll over the tabs in the diagram to view different representations of functions.
- **Slide 9** – The teacher will discuss the representation of functions using function notation. As a whole group, complete and discuss the activity at the bottom of the slide.
- **Slide 10** – Play the video. The teacher will model example 3. As a whole group, complete and discuss the activity at the bottom of the slide.
- **Slide 11** – The teacher will model example 4. As a whole group, complete and discuss the activity at the bottom of the slide.
- **Slide 12** – The teacher will model example 5. As a whole group, complete and discuss the activities.
- **Slide 13** – The teacher will discuss the representation of functions using graphs.
- **Slide 14** – The teacher will model example 6. Play the video.
- **Slide 15** – The teacher will discuss the vertical line test. Play the video. As a whole group, complete and discuss the activity.
- **Slide 16** – The teacher will model example 7. Play the video. As a whole group, complete and discuss the activity.
- **Slide 17** – The teacher will model example 8. Play the video. As a whole group, complete and discuss the activity.
- **Slide 18** - As a whole group, complete the activity. Discuss.

Lesson Activities (We Do) – 25 minutes

- All activities are within the grade results lesson and should be completed as they appear in the lesson. As a whole group, complete the Practice Activities. These activities are listed in the slides above.

Supplemental (optional)

- Supplemental videos are in grade results for additional support. Click on the tab “Supplemental” within the lesson.

Additional Teacher Resources: None

Lesson Review – 10 minutes

Slide 19 - Summarize the lesson with a lesson review in Grade Results. Students can ask questions or review previous slides for a better understanding of the material prior to moving on to the independent work.

- A relation is a set of input and output values, usually represented as ordered pairs.
- The set of all input values is called the domain.
- The set of all output values is called the range.
- A function is a relation in which each element in the domain is paired exactly with one element in the range.
- A function rule is an equation that describes the relationship between dependent and independent variables.
- A function notation is a way to name a function defined by an equation.
- Vertical line test is used to determine whether the given relation is a function or not.
- If the vertical line intersects the graph exactly at one point, then the graph represents a function.
- All relations are not functions, but all functions are relations.

Independent Work – Posttest (They Do) – 40 minutes

- Explain that students will work independently to complete the post-test. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson. All students are required to complete student activities as part of their class assignments.

Closing/Wrap-Up – 5 minutes

Take a moment to reflect on the lesson of the day and pick one of the following closure activities as time permits.

Examples:

- Repeat the Lesson Review,
- Use an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?
- Ask students to explain the relevance of the concept to their life or how they might use it.

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 7

Topic/Lesson Title & Grade Results #: Lesson #7 - Input and Output Values of Functions and Interpretation

Objective(s)

- The student will be able to understand functions.
- The student will be able to denote functions mathematically using function notation.
- The students will be able to compute function values for inputs in its domain.
- The student will be able to use functions to solve real-life problems.

Guiding Question(s)

- How can you represent and describe functions?
- How can functions describe real-world situations, model predictions, and solve problems?

TN Curriculum Standard(s)

- A1.F.IF.A.2 - Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of context.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil or notes in Grade Results.

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students to stay focused and engaged in the learning process.

Attendance in PowerSchool – 5 minutes

Key Vocabulary/Terms - 5 minutes

Slide 20 - As a whole group, Define and discuss the meaning of the vocabulary words.

- Dependent Variable: A variable whose values depend on another variable.
- Domain: The set of all input values of a function.
- Independent Variable: A variable whose value determines the value of other variables.
- Range: The set of all output values of a function.

Lesson Introduction (I Do) – 30 minutes

- **Slide 1** – The students will state the objectives.
- **Slide 2** – The teacher will discuss how a function is a relation between the set of input and output values,
- **Slide 3** – The teacher will discuss function notation and how it is written.
- **Slide 4** – The teacher will discuss mapping the domain and range of a function. The teacher will give examples of different functions written in function notation.
- **Slide 5** – As a whole group, complete the activity. Discuss.
- **Slide 6** – The teacher will model example 1.
- **Slide 7** – As a whole group, complete the activity. Discuss.
- **Slide 8** – The teacher will model example 2. Play the video. The teacher will discuss x and y intercepts.
- **Slide 9** – Play the video if time permits.
- **Slide 10** – The teacher will model examples 3 and 4.
- **Slide 11** – Play the video if time permits.
- **Slide 12** – The teacher will model example 5. As a whole group, complete and discuss the activity.

- **Slide 13** – As a whole group, complete the activity. Discuss.
- **Slide 14** – The teacher will model example 6.
- **Slide 15** – The teacher will model example 8.
- **Slide 16** – The teacher will model example 9.
- **Slides 17 – 18** As a whole group, complete the activities. Discuss.

Lesson Activities (We Do) – 25 minutes

- All activities are within the grade results lesson and should be completed as they appear in the lesson. As a whole group, complete the Practice Activities. These activities are listed in the slides above.

Supplemental (optional)

- Supplemental videos are in grade results for additional support. Click on the tab “Supplemental” within the lesson.

Additional Teacher Resources: None

Lesson Review – 10 minutes

Slide 19 - Summarize the lesson with a lesson review in Grade Results. Students can ask questions or review previous slides for a better understanding of the material prior to moving on to the independent work.

- A function is a unique relationship between an independent variable and a dependent variable.
- Functions in the form of ordered pairs and graphs can be represented using function notation.
- To find the output for a specific input value, plug in the input value in the function and simplify it.
- The domain of most algebraic functions, except rational and square root functions, is the set of all real numbers.

Independent Work – Posttest (They Do) – 40 minutes

- Explain that students will work independently to complete the post-test. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson. All students are required to complete student activities as part of their class assignments.

Closing/Wrap-Up – 5 minutes

Take a moment to reflect on the lesson of the day and pick one of the following closure activities as time permits.

Examples:

- Repeat the Lesson Review,
- Use an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?
- Ask students to explain the relevance of the concept to their life or how they might use it.

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 8

Topic/Lesson Title & Grade Results #: Lesson #8 – Domain of a Function

Objective(s)

- The student will be able to define the domain of a function and the notations used.
- The student will be able to find the domain of linear and non-linear functions from given contexts.
- The student will be able to relate the domain of a function to its graph.

Guiding Question(s)

- How do you determine the domain of a function as an equation?
- How do you determine the domain of a function when given its graph?
- How do you determine the domain of a function when given a verbal statement?
- In what kind of real-world situations would the domain of a linear function be restricted?

TN Curriculum Standard(s)

- A1.F.IF.B.4 - Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil or notes in Grade Results

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students stay focused and engaged in learning.

Attendance in PowerSchool – 5 minutes

Key Vocabulary/Terms - 5 minutes

Slide 26 - As a whole group, Define and discuss the meaning of the vocabulary words.

- Domain: Set of all possible input values of a function.
- Function: An algebraic equation that describes a situation where one quantity determines another.
- Interval Notation: A method of representing a certain span or group of numbers inside brackets.
- Linear Function: A function in which the degree of the variable is one.
- Non-Linear Function: A function in which the degree of the variable is other than one.
- Range: Set of all output values of a function.
- Set-Builder Notation: A function rule or a statement written within brackets, where the set is well defined.

Lesson Introduction (I Do) – 40 minutes

- **Slide 1** – The students will state the objectives
- **Slide 2** – The teacher will discuss how a function describe situations with one quantity determining another quantity.
- **Slide 3** – The teacher will model example 1.
- **Slide 4** – The teacher will discuss the domain and range of a function.
- **Slide 5** – As a whole group, complete the activity. Discuss.
- **Slide 6** – The teacher will discuss the notation for writing the domain of a function. Roll of the tabs of the diagram to view each notation.
- **Slide 7** – The teacher will discuss interval notation.

- **Slide 8** – As a whole group, complete the activity. Discuss
- **Slide 9** – As a whole group, complete the activity. Discuss.
- **Slide 10** – The teacher will discuss set-builder notation and model example 2.
- **Slide 11** – As a whole group, complete the activity. Discuss.
- **Slide 12** – The teacher will discuss the domain of a linear function and model example 3.
- **Slide 13** – As a whole group, complete the activity. Discuss.
- **Slide 14** – The teacher will discuss the domain of non-linear functions.
- **Slide 15** – The teacher will model example 4. Play video.
- **Slide 16** – As a whole group, complete the activity. Discuss
- **Slide 17** – The teacher will model example 5.
- **Slide 18** – Play the video.
- **Slide 19** – As a whole group, complete the activity. Discuss
- **Slide 20** – The teacher will model example 6. As a whole group, complete and discuss the video.
- **Slide 21** – The teacher will discuss the relationship between the domain of a function and its graph. Play the video.
- **Slide 22** – The teacher will model example 7. Play the video.
- **Slide 23** – The teacher will model example 8.
- **Slide 24** - As a whole group, complete the activity. Discuss.

Lesson Activities (We Do) – 25 minutes

- All activities are within the grade results lesson and should be completed as they appear in the lesson. As a whole group, complete the Practice Activities. These activities are listed in the slides above.

Supplemental (optional)

- Supplemental videos are in grade results for additional support. Click on the tab “Supplemental” within the lesson.

Additional Teacher Resources: None

Lesson Review – 10 minutes

Slide 25 - Summarize the lesson with a lesson review in Grade Results. Students can ask questions or review previous slides for a better understanding of the material prior to moving on to the independent work.

- Function describes a situation where one quantity determines another.
- The domain is the set of all possible input values of a function.
- The set of all output values of a function is called range.
- The domain of all linear functions is the set of all real numbers from $-\infty$ to $+\infty$
- The domain of all non-linear functions is not the same, and they vary according to the function.
- To find the domain of the function f from the graph, project each point on the graph of f onto the x -axis and collect y -values. The x -values constitute the domain of the graph of the function.

Independent Work – Posttest (They Do) – 40 minutes

- Explain that students will work independently to complete the post-test. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson. All students are required to complete student activities as part of their class assignments.

Closing/Wrap-Up – 5 minutes

Take a moment to reflect on the lesson of the day and pick one of the following closure activities as time permits.

Examples:

- Repeat the Lesson Review,
- Use an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?
- Ask students to explain the relevance of the concept to their life or how they might use it.

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 9

Topic/Lesson Title & Grade Results #: Lesson #9 - Relationship Between Two Quantities and Key Features of Graphs and Tables

Objective(s)

- List the key features of a function.
- Interpret the key features of a given function from the equation or the graph.

Guiding Question(s)

- How do you write a function to describe the relationship between two quantities?
- Given a graph, how do you identify key features such as domain, range, intercepts, etc.?

TN Curriculum Standard(s)

- A1.F.IF.B.3 - 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.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil or notes in Grade Results

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students stay focused and engaged in learning.

Attendance in PowerSchool – 5 minutes

Key Vocabulary/Terms - 5 minutes

Slide 23 - As a whole group, Define and discuss the meaning of the vocabulary words.

- Intercept: The coordinates of the point at which a line or a curve intersects an axis.
- Interval: The set of numbers consisting of all the numbers between a pair of given numbers. Either, both or neither of the endpoints may be included in the interval.
- Maximum: The largest value of a set, function, etc.
- Minimum: The smallest value of a set, function, etc.
- Symmetry: A property that is possessed by a mathematical object, such that performing a given operation leaves the object invariant.

Lesson Introduction (I Do) – 30 minutes

- **Slide 1** – The student will state the objectives
- **Slide 2** – Play the video. The teacher will introduce functions as the relationship between the domain and the range.
- **Slide 3** – The teacher will discuss the key features of a function.
- **Slide 4** – Play the video. The teacher will discuss the x and y intercepts of a function.
- **Slide 5** – The teacher will model example 1 (Finding intercepts of a function). As a whole group, complete and discuss the activity on the slide.
- **Slide 6** – The teacher will model example 2 (key features of a function in real-world examples).
- **Slide 7** - The teacher will model example 3 (key features of a function – slope or rate of change). Play the video.
- **Slide 8** – The teacher will discuss key features of an increasing function. Play the video.
- **Slide 9** – The teacher will discuss key features of a decreasing function. Play the video.

- **Slide 10** – The teacher will model example 4 (finding the end behavior of a function). Play the video.
- **Slide 11** - The teacher will discuss intervals in which a function is positive or negative.
- **Slide 12** – The teacher will discuss the maximum and minimum values of a function.
- **Slide 13** – The teacher will model example 5 (finding extreme values of a function and intervals in which a function is increasing or decreasing).
- **Slide 14** – Play the video if time permits.
- **Slide 15** – The teacher will model example 6 (finding extreme values in real-life examples). Play the video.
- **Slide 16** – The teacher will model example 7 (finding extreme values in real-life examples).
- **Slide 17** – The teacher will discuss the symmetry of a graph.
- **Slide 18** – The teacher will model example 8 (the axis of symmetry of a quadratic function)
- **Slide 19** – The teacher will discuss the end behaviors of a function. Play the video.
- **Slide 20** – The teacher will model example 9 (finding the end behavior of a function). As a whole group, complete the activity on the slide.
- **Slide 21** - As a whole group, complete the activity. Discuss.

Lesson Activities (We Do) – 10 minutes

- All activities are within the grade results lesson and should be completed as they appear in the lesson. As a whole group, complete the Practice Activities. These activities are listed in the slides above.

Additional Teacher Resources – None

Lesson Review – 10 minutes

Slide 22 - Summarize the lesson with a lesson review in Grade Results. Students can ask questions or review previous slides for a better understanding of the material prior to moving on to the independent work.

- A function is a relationship between two quantities, the domain, and the range.
- Intercepts, slope, increasing and decreasing intervals of functions, relative maximum and minimum, symmetry, and end behavior are some of the key features of functions.
- The slope-intercept form of a linear function is $y = mx + b$, m is the slope and b is the y-intercept, and $-\frac{b}{m}$ is the x-intercept.
- The extreme point of a quadratic function $ax^2 + bx + c$ occurs when $x = -\frac{b}{2a}$.
- If $f(x)$ increases when x increases, then $f(x)$ is an increasing function.
- If $f(x)$ increases when x decreases, then $f(x)$ is a decreasing function.
- End behavior of a function depends on the degree and the sign of the leading coefficient of the function.

Independent Work – Posttest (They Do) – 60 minutes

- Explain that students will work independently to complete the post-test. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson. All students are required to complete student activities as part of their class assignments.

Closing/Wrap-Up – 10 minutes

Take a moment to reflect on the lesson of the day and pick one of the following closure activities as time permits.

Examples:

- Repeat the Lesson Review
- Use an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?
- Ask students to explain the relevance of the concept to their life or how they might use it.

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 10

Topic/Lesson Title & Grade Results #: Post-Test Review & Post-Test

Objective(s): Students will review and complete all incomplete/missed/failed coursework.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil, or notes in Grade Results

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students stay focused and engaged in learning.

Attendance in PowerSchool – 5 minutes

Lesson Introduction (I Do) – 30 minutes

- Identify the purpose of the course
- Connect the course to missing or future coursework

Lesson Activities and Review (We Do) – 40 minutes

Check Grade Results and have students review activities/lessons that they have not completed or need assistance with. Hold an open Q&A for students to ask questions regarding the activities/lessons they are reviewing.

Independent Work – Posttest (They Do) - 40 minutes

Students will review and complete any incomplete/missed/failed coursework.

While students are working on independent work, teachers can:

- Validate all posttests are completed.
- Update and resolve any discrepancies in Parent Contact Logs and Communication Notes
- Validate all supporting documentation for Special Education and ESL students
- Validate students home address

Closing/Wrap Up – 5 minutes

SEMESTER 2

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 11

Topic/Lesson Title & Grade Results #: Lesson #1 – Interpreting Linear Functions

Objective(s)

- The student will be able to determine a linear function from the given data.
- The student will be able to interpret slope and y-intercept from the linear function.
- The student will be able to predict a reasonable measure from the linear function.

Guiding Question(s)

- What does the slope of a line indicate about the line?
- What information does the equation of a line give you?
- How are equations and graphs related?

TN Curriculum Standard(s)

- A1.F.LE.A.1 - Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Recognize that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil, or notes in Grade Results

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students stay focused and engaged in learning.

Attendance in PowerSchool – 5 minutes

Key Vocabulary/Terms - 5 minutes

Slide 13 - As a whole group, define and discuss the meaning of the vocabulary words.

- Linear Function: A function of the form $Ax + By = C$.
- Slope: The measure of the steepness of a straight line.
- x-intercept: The point where a line crosses the x-axis.
- y-intercept: The point where a line crossed the y-axis.

Lesson Introduction (I Do) – 30 minutes

- **Slide 1** – The students will state the objectives
- **Slide 2** – The teacher will introduce linear functions by discussing how to write a linear function.
- **Slide 3** – The teacher will discuss the representations of linear functions.
- **Slide 4** – The teacher will discuss the standard form of linear equations.
- **Slide 5** – The teacher will model example 1 (graphing linear functions).
- **Slide 6** – As a whole group, complete the activity (determining linear functions). Discuss.
- **Slide 7** – Play the video (determining linear functions).
- **Slide 8** – The teacher will model example 2 (how to determine linear functions from give data).
- **Slide 9** – The teacher will model example 3 (interpreting slope and y-intercept).
- **Slide 10** – As a whole group, complete the activity (interpret linear functions). Discuss.
- **Slide 11** – As a whole group, complete the activity (finding rate of change). Discuss.

Lesson Activities (We Do) – 20 minutes

All activities are within the grade results lesson and should be completed as they appear in the lesson. As a whole group, complete the practice activities. These activities are listed in the slides above.

Supplemental – Optional

- A supplemental video is in grade results for additional support. Click on the “Supplemental” tab to find the video.

Lesson Review – 15 minutes

Slide 12 - Summarize the lesson with a lesson review in Grade Results. Students can ask questions or review previous slides for a better understanding of the material prior to moving on to the independent work.

- The slope-intercept form is $y = mx + b$, where m represents the slope of the line and b represents the y-intercept.
- The standard form of a linear equation is $Ax + By = C$, where A , B , and C are real numbers.
- Linear functions can be determined from two points or a table of values.

Independent Work – Posttest (They Do) - 40 minutes

Explain that students will work independently to complete the post-test. Encourage them to think critically and do their very best on the posttest. The posttest will count as the grade for the daily lesson. All students are required to complete student activities as part of their class assignments.

While students are working on independent work, teachers can:

- Validate all posttests are completed.
- Update and resolve any discrepancies in Parent Contact Logs and Communication Notes
- Validate all supporting documentation for Special Education and ESL students
- Validate students home address

Closing/Wrap Up – 5 minutes

Take a moment to reflect on the lesson of the day and pick one of the following closure activities as time permits.

Examples:

- Repeat the Lesson Review,
- Use an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?
- Ask students to explain the relevancy of the concept to their life or how they might use it.

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 12

Topic/Lesson Title & Grade Results #: Lesson #2 – Interpreting Rate of Change

Objective(s)

- The student will be able to explain that the slope of a line is its rate of change.
- The student will be able to recognize situations in which one quantity changes at a constant rate with respect to the other quantity.

Guiding Question(s)

- How do I calculate the average rate of change of a quadratic function?

TN Curriculum Standard(s)

- A1.F.LE.A.1bc - Distinguish between situations that can be modeled with linear functions and with exponential functions. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant factor per unit interval relative to another.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil, or notes in Grade Results

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students stay focused and engaged in learning.

Attendance in PowerSchool – 5 minutes

Key Vocabulary/Terms - 5 minutes

Slide 20 - As a whole group, Define and discuss the meaning of the vocabulary words.

- Slope: The measure of the steepness of a straight line.
- Rate of change: The ratio at which a quantity changes over changes in another quantity.

Lesson Introduction (I Do) – 35 minutes

- **Slide 1** – The students will state the objectives.
- **Slide 2** – The teacher will introduce the rate of change at which one quantity changes in relation to another quantity.
- **Slide 3** – The teacher will discuss slope and rate of change. Play the video (slope or rate of change).
- **Slide 4** – As a whole group, complete the activity. Discuss.
- **Slide 5** – The teacher will model example 1 (finding the rate of change).
- **Slide 6** – As a whole group, complete the activity. Discuss.
- **Slide 7** – The teacher will model example 2 (rate of change of linear and exponential functions).
- **Slide 8** – As a whole group, complete the activity. Discuss.
- **Slide 9** – The teacher will model example 3 (real life example of rate of change).
- **Slide 10** – As a whole group, complete the activity. Discuss.
- **Slide 11** – The teacher will model example 4 (real life example of rate of change).
- **Slide 12** – As a whole group, complete the activity. Discuss.
- **Slide 13** – The teacher will model example 5 (rate of change from equations).
- **Slide 14** – Play the video
- **Slide 15** – As a whole group, complete the activity. Discuss.

- **Slide 16** – The teacher will model example 6 (real life example of rate of change).
- **Slide 17** – As a whole group, complete the activity. Discuss.
- **Slide 18** - As a whole group, complete the activity. Discuss.

Lesson Activities (We Do) – 20 minutes

All activities are within the grade results lesson and should be completed as they appear in the lesson. As a whole group, complete the Practice Activities. These activities are listed in the slides above.

Lesson Review – 10 minutes

Slide 12 - Summarize the lesson with a lesson review in Grade Results. Students can ask questions or review previous slides for a better understanding of the material prior to moving on to the independent work.

- Rate of change is the rate that describes how one quantity changes in relation to another quantity.
- The slope is also called gradient (or) incline (or) pitch (or) rate of change. It may be positive or negative or zero.
- Slope can be expressed as $\frac{\text{change in } y}{\text{change in } x}$ or $\frac{\text{vertical change}}{\text{horizontal change}}$ or $\frac{y_2 - y_1}{x_2 - x_1}$ or $\frac{\text{rise}}{\text{run}}$.

Independent Work – Posttest (They Do) – 40 minutes

Explain that students will work independently to complete the post-test. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson. All students are required to complete student activities as part of their class assignments.

While students are working on independent work, teachers can:

- Validate all posttests are completed.
- Update and resolve any discrepancies in Parent Contact Logs and Communication Notes
- Validate all supporting documentation for Special Education and ESL students
- Validate students home address

Closing/Wrap Up - 5 minutes

Take a moment to reflect on the lesson of the day and pick one of the following closure activities as time permits.

Examples:

- Repeat the Lesson Review,
- Use an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?
- Ask students to explain the relevancy of the concept to their life or how they might use it.

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 13

Topic/Lesson Title & Grade Results #: Lesson #3 - Exponential Growth and Decay

Objective(s)

- Define exponential functions.
- Explain the difference between exponential growth and exponential decay.
- Solve problems involving exponential growth and decay.

Guiding Question(s)

- What are discrete exponential functions and how can you represent them?
- How do you write, graph, and interpret an exponential growth or decay function?
- How can you recognize, describe, and compare linear and exponential functions?

TN Curriculum Standard(s)

- A1.F.LE.A.1bc - Distinguish between situations that can be modeled with linear functions and with exponential functions. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant factor per unit interval relative to another.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil, or notes in Grade Results

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students stay focused and engaged in learning.

Attendance in PowerSchool – 5 minutes

Key Vocabulary/Terms - 5 minutes

Slide 23 - As a whole group, Define and discuss the meaning of the vocabulary words.

- Compound Interest: An interest that is paid on both the principal and on any interest from past years.
- Decay Factor: The rate at which a variable's value diminishes over time.
- Decay Rate: The percentage of the amount that is left.
- Exponential Decay: A quantity that decays by a fixed percent at regular intervals.
- Exponential Growth: A quantity that grows by a fixed percent at regular intervals.
- Growth Factor: The factor by which a quantity multiplies itself over time.
- Growth Rate: The addend by which a quantity increases (or decreases) over time.
- Half-life: The amount of time it takes for half of the atoms in a sample to decay.

Lesson Introduction (I Do) – 40 minutes

- **Slide 1** – The students will state the objective
- **Slide 2** – Play the video to introduce exponential growth and decay.
- **Slide 3** – The teacher will discuss examples of exponential functions in the real world.
- **Slide 4** – The teacher will discuss exponential growth functions.
- **Slide 5** – The teacher will model example 1 (exponential growth functions).
- **Slide 6** – As a whole group, complete the activity. Discuss.
- **Slide 7** – The teacher will model example 2 (exponential growth functions).
- **Slide 8** – The teacher will model example 3 (exponential growth functions).

- **Slide 9** – Play the video.
- **Slide 10** – The teacher will model example 4 (doubling time).
- **Slide 11** – The teacher will discuss exponential decay functions.
- **Slide 12** – The teacher will model example 5 (exponential decay functions).
- **Slide 13** – The teacher will discuss carbon dating problems and carbon dating process. Play the video.
- **Slide 14** – The teacher will model example 6 (carbon dating problems).
- **Slide 15** – As a whole group, complete the activity. Discuss.
- **Slide 16** – Play the video on exponential decay functions.
- **Slide 17** – The teacher will model example 7 (exponential decay functions).
- **Slide 18** – The teacher will model example 8 (exponential decay functions).
- **Slide 19** – The teacher will model example 9 (finding the decay factor). Complete and discuss the activity at the bottom of the slide as a whole group.
- **Slide 20** – As a whole group, complete the activity. Discuss.
- **Slide 21** – As a whole group, complete the activity. Discuss.

Lesson Activities (We Do) – 15 minutes

All activities are within the grade results lesson and should be completed as they appear in the lesson. As a whole group, complete the Practice Activities. These activities are listed in the slides above.

Supplemental (optional)

- A supplemental video is in grade results for additional support. Click on the “Supplemental” tab to find the video.

Lesson Review – 10 minutes

Slide 22 - Summarize the lesson with a lesson review in Grade Results. Students can ask questions or review previous slides for a better understanding of the material prior to moving on to the independent work.

- Any quantity that grows by a fixed percent at regular intervals is said to possess exponential growth.
- The exponential growth model is given by $y = y_0e^{kt}$, where $k > 0$ and $y = C(1 + r)^t$.
- Any quantity that decays by a fixed percent at regular intervals is said to possess exponential decay.
- The exponential decay model is given by $y = y_0e^{kt}$, where $k < 0$ and $y = C(1 - r)^t$.
- The amount of radiocarbon after t years is given by $y = y_0e^{-0.0001216t}$.

Independent Work – Posttest (They Do) – 40 minutes

Explain that students will work independently to complete the post-test. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson. All students are required to complete student activities as part of their class assignments.

While students are working on independent work, teachers can:

- Validate all posttests are completed.
- Update and resolve any discrepancies in Parent Contact Logs and Communication Notes
- Validate all supporting documentation for Special Education and ESL students
- Validate students home address

Closing/Wrap Up – 5 minutes

Take a moment to reflect on the lesson of the day and pick one of the following closure activities as time permits.

Examples:

- Repeat the Lesson Review,
- Use an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?
- Ask students to explain the relevancy of the concept to their life or how they might use it.

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 14

Topic/Lesson Title & Grade Results #: Lesson #4 – Addition and Subtraction of Polynomials

Objective(s)

- The student will recall polynomials and terminologies involved in them.
- The student will be able to add polynomials.
- The student will be able to subtract polynomials.

Guiding Question(s)

- How can polynomials be simplified and applied to solve problems?
- Can two algebraic expressions that appear to be different be equivalent?
- How are the properties of real numbers related to polynomials?

TN Curriculum Standard(s)

- A1.A.APR.A.1 - Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil, or notes in Grade Results

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students stay focused and engaged in learning.

Attendance in PowerSchool – 5 minutes

Key Vocabulary/Terms - 5 minutes

Slide 11 - As a whole group, Define and discuss the meaning of the vocabulary words.

- Coefficient: Real numbers or variables multiplied with the terms of an expression.
- Degree of a polynomial: The highest exponent in a polynomial.
- Leading coefficient: The coefficient of the term with the highest degree.
- Leading term: The term in a polynomial which contains the highest power of the variable.
- Like terms: Terms that contain the same variables raised to the same power.
- Unlike terms: Terms that contain different variables raised to different powers.
- Polynomial: A mathematical expression consisting of a sum of terms, where each term includes a variable or variables raised to a power and multiplied by a coefficient.
- Term: A part of an expression consisting of a number or one or more variables or their product.
- Variable: A letter or symbol that represents different values.

Lesson Introduction (I Do) – 30 minutes

- **Slide 1** – The students will state the objectives.
- **Slide 2** – The teacher will introduce polynomials. As a whole group, complete and discuss the activity at the bottom of the slide.
- **Slide 3** – The teacher will discuss the definition of a term. As a whole group, complete and discuss the activities on the slide.
- **Slide 4** – The teacher will model examples 1-5 (adding polynomials).
- **Slide 5** – The teacher will model examples 6 – 7 (adding polynomials using the vertical method).

- **Slide 6** – The teacher will model example 8 (vertical problems on adding polynomials). Complete and discuss the activity at the bottom of the slide as a whole group.
- **Slide 7** – The teacher will model examples 1 and 2 (subtracting polynomials).
- **Slide 8** – The teacher will model examples 3 and 4 (subtracting polynomials by vertical method).
- **Slide 9** – The teacher will model example 5 (subtracting polynomials by vertical method). As a whole group, complete and discuss the activity. Play the video if time permits.

Lesson Activities (We Do) – 15 minutes

All activities are within the grade results lesson and should be completed as they appear in the lesson. As a whole group, complete the Practice Activities. These activities are listed in the slides above.

Supplemental – 10 minutes

- View and discuss the supplemental video in grade results for additional support. Click on the “Supplemental” tab in the lesson.

Lesson Review – 10 minutes

Slide 10 - Summarize the lesson with lesson review in Grade Results. Students can ask questions or review previous slides for a better understanding of the material prior to moving on to the independent work.

- To add polynomials, group the like terms together, and then add them.
- To subtract polynomials, change the sign of the terms being subtracted, and then combine the like terms.

Independent Work – Posttest (They Do) – 40 minutes

Explain that students will work independently to complete the post-test. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson. All students are required to complete student activities as part of their class assignments.

While students are working on independent work, teachers can:

- Validate all posttests are completed.
- Update and resolve any discrepancies in Parent Contact Logs and Communication Notes
- Validate all supporting documentation for Special Education and ESL students
- Validate students home address

Closing/Wrap Up - 5 minutes

Take a moment to reflect on the lesson of the day and pick one of the following closure activities as time permits.

Examples:

- Repeat the Lesson Review,
- Use an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?
- Ask students to explain the relevancy of the concept to their life or how they might use it.

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 15

Topic/Lesson Title & Grade Results #: Lesson #5 – Multiplying Polynomials

Objective(s)

- The student will be able to multiply monomials.
- The student will be able to multiply a monomial with a polynomial.
- The student will be able to multiply binomials.
- The student will be able to multiply polynomials with two or more terms.

Guiding Question(s)

- How can polynomials be simplified and applied to solve problems?
- Can two algebraic expressions that appear to be different be equivalent?
- How are the properties of real numbers related to polynomials?

TN Curriculum Standard(s)

- A1.A.APR.A.1 - Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil, or notes in Grade Results

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students to stay focused and engaged in the learning process.

Attendance in PowerSchool – 5 minutes

Key Vocabulary/Terms - 10 minutes

Slide 14 - As a whole group, Define and discuss the meaning of the vocabulary words.

- Binomial: A mathematical expression with two terms.
- Coefficient: Real number or variable multiplied with the term of an expression.
- Degree of a Polynomial: The highest exponent in a polynomial.
- Leading Coefficient: The coefficient of the term with the highest degree.
- Leading Term: The term in a polynomial which contains the highest power of the variable.
- Like Terms: Terms that contain the same variables raised to the same power.
- Monomial: A mathematical expression with one term.
- Polynomial: A mathematical expression consisting of a sum of terms, where each term includes a variable or variables raised to a power and multiplied by a coefficient.
- Term: A part of an expression consisting of a number or one or more variables or their product.
- Unlike Terms: Terms that contain different variables raised to different powers.

Lesson Introduction (I Do) - 30 minutes

- **Slide 1** – The students will state the objective
- **Slide 2** – The teacher will introduce polynomials and their classifications. As a whole group, complete and discuss the activity at the bottom of the slide.
- **Slide 3** – The teacher will model example 1 (multiplying monomials). As a whole group, complete and discuss the activity on the slide.
- **Slide 4** – The teacher will model example 2 (multiplying monomials). As a whole group, complete and discuss the activity on the slide.

- **Slide 5** – The teacher will model examples 3 and 4 (multiplying a monomial by a binomial). As a whole group, complete and discuss the activity on the slide.
- **Slide 6** – The teacher will model examples 5 and 6 (multiplying a monomial with a polynomial).
- **Slide 7** – The teacher will model examples 7 and 8 (multiplying binomials). As a whole group, complete and discuss the activity on the slide. Play the video if time permits.
- **Slide 8** – The teacher will model example 9 (multiplying a binomial with a trinomial using the vertical method).
- **Slide 9** – The teacher will model example 10 (multiplying two polynomials). As a whole group, complete and discuss the activity on the slide.
- **Slide 10** – The teacher will model example 11 (polynomials in real life).
- **Slide 11** – The teacher will model example 12 (polynomials in real life). As a whole group, complete and discuss the activity on the slide.
- **Slide 12** – As a whole group, complete the activity. Discuss.

Lesson Activities (We Do) – 20 minutes

All activities are within the grade results lesson and should be completed as they appear in the lesson. As a whole group, complete the Practice Activities. These activities are listed in the slides above.

Supplemental (optional)

- A supplemental video is in grade results for additional support. Click on the “Supplemental” tab to find the video.

Lesson Review – 10 minutes

Slide 13 - Summarize the lesson with a lesson review in Grade Results. Students can ask questions or review previous slides for a better understanding of the material prior to moving on to the independent work.

- To multiply monomials with the same variables, multiply the coefficients and add the exponents.
- To multiply a monomial with a polynomial, distribute the monomial over each term of the polynomial.
- To multiply binomials, use FOIL method, where "F" denotes the product of the first terms, "O" denotes the product of the outer terms, "I" denotes the product of the inner terms, and "L" denotes the product of the last terms.

Independent Work – Posttest (They Do) – 40 minutes

Explain that students will work independently to complete the post-test. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson. All students are required to complete student activities as part of their class assignments.

While students are working on independent work, teachers can:

- Validate all posttests are completed.
- Update and resolve any discrepancies in Parent Contact Logs and Communication Notes
- Validate all supporting documentation for Special Education and ESL students
- Validate students home address

Closing/Wrap Up - 5 minutes

Take a moment to reflect on the lesson of the day and pick one of the following closure activities as time permits.

Examples:

- Repeat the Lesson Review,
- Use an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?
- Ask students to explain the relevancy of the concept to their life or how they might use it.

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 16

Topic/Lesson Title & Grade Results #: Lesson #6 - Graph Linear and Quadratic Functions – Slope Intercepts

Objective(s)

- The student will be able to graph a linear function.
- The student will be able to graph a quadratic function.
- The student will be able to find the intercepts, maxima, and minima of the given functions.

Guiding Question(s)

- How are linear functions graphed from a table?
- How are linear functions graphed from an equation?
- What key features are needed to graph a quadratic function?
- How are quadratic functions graphed using the key features?

TN Curriculum Standard(s)

- A1.F.IF.C.6a - Graph functions expressed symbolically and show key features of the graph, by hand and using technology. a. Graph linear and quadratic functions and show intercepts, maxima, and minima.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil, or notes in Grade Results

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students stay focused and engaged in learning.

Attendance in PowerSchool – 5 minutes

Key Vocabulary/Terms - 10 minutes

Slide 17 - As a whole group, Define and discuss the meaning of the vocabulary words.

- Linear equation: An equation, that when graphed, makes a straight line.
- Standard form of a linear equation: The standard form of a linear equation is $Ax + By = C$, where A is a positive integer and B and C are integers.
- Slope-intercept form of a linear equation: The slope-intercept form of a linear equation is $y = mx + b$, where m is the slope and b is the y-intercept.
- Quadratic Equation: An equation, that when graphed, makes a parabola, which is an arch or u-shaped curve.
- Standard form of a quadratic function: The standard form of a quadratic function is $y = ax^2 + bx + c$, where $a \neq 0$.
- Parabola: A U-shaped curve of a quadratic function.
- Vertex of a quadratic function: The maximum or minimum point of a quadratic function.
- x-intercept: The point at which a line or curve crosses the x-axis. When a line or curve crosses the x-axis $y = 0$.
- y-intercept: The point at which a line or curve crosses the y-axis. When a line or curve crosses the y-axis $x = 0$.

Lesson Introduction (I Do) – 25 minutes

- **Slide 1** – The students will state the objectives.
- **Slide 2** – The teacher will introduce parabolas and how to find the maxima and minima of parabolas.
- **Slide 3** – The teacher will model example 1 (how to find intercepts of a linear function and graph using those intercepts). Play the video. As a whole group, complete and discuss the activities.
- **Slide 4** – The teacher will model example 2 (slope intercept form). As a group, complete and discuss the activities. Play the video if time permits.

- **Slide 5** – The teacher will model example 3 (writing and graphing an equation in slope intercept form)
- **Slide 6** – As a whole group, complete the activity. Discuss.
- **Slide 7** – The teacher will discuss graphing a quadratic function.
- **Slide 8** – The teacher will model example 4 (graphing a quadratic function). As a whole group, complete and discuss the activity at the bottom of the slide.
- **Slide 9** – The teacher will model examples 5 and 6 (finding the vertex of quadratic functions). As a whole group, complete and discuss the activities on the slide.
- **Slide 10** – As a whole group, complete the activity. Discuss.
- **Slide 11** – The teacher will model example 7 (graphing quadratic functions using intercepts and vertex).
- **Slide 12** – The teacher will model examples 8 and 9 (graphing quadratic functions using intercepts and vertex). Play the video if time permits.
- **Slide 13** – The teacher will model example 10 (graphing quadratic functions using intercepts and vertex).
- **Slide 14** – The teacher will model example 11 (graphing quadratic functions using intercepts and vertex).
- **Slide 15** - As a whole group, complete the activity. Discuss.

Lesson Activities (We Do) – 15 minutes

All activities are within the grade results lesson and should be completed as they appear in the lesson. As a whole group, complete the Practice Activities. These activities are listed in the slides above.

Supplemental (optional)

- A supplemental video is in grade results for additional support. Click on the “Supplemental” tab to find the video.

Lesson Review – 10 minutes

Slide 16 - Summarize the lesson with lesson review in Grade Results. Students can ask questions or review previous slides for a better understanding of the material prior to moving on to the independent work.

- The point at which the line/curve crosses or cuts the x-axis is called the x-intercept.
- The point at which the line/curve crosses or cuts the y-axis is called the y-intercept.
- To find the x-intercept, substitute 0 for y into the given equation.
- To find the y-intercept, substitute 0 for x into the given equation.
- All parabolas are symmetric with respect to a line called the axis of symmetry.
- The axis of symmetry divides the parabola into two halves, which are mirror images of each other.
- Quadratic Formula: $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$.
- The x-coordinate of the vertex can be found using the formula $x = -\frac{b}{2a}$.
- When the equation of a parabola is written in standard form, $y = ax^2 + bx + c$, the sign of "a" tells you if the quadratic function attains a maximum or a minimum.
- When $a > 0$, the function has a minimum at the vertex.
- When $a < 0$, the function has a maximum at the vertex.
- When the equation of a parabola is written in vertex form, $y = a(x - h)^2 + k$, the vertex is (h, k) . The "a" in vertex form is the same as the "a" in standard form.
- When $a > 0$, the function has a minimum at the vertex (h, k) .
- When $a < 0$, the function has a maximum at the vertex (h, k) .

Independent Work – Posttest (They Do) – 50 minutes

Explain that students will work independently to complete the post-test. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson. All students are required to complete student activities as part of their class assignments.

While students are working on independent work, teachers can:

- Validate all posttests are completed.
- Update and resolve any discrepancies in Parent Contact Logs and Communication Notes
- Validate all supporting documentation for Special Education and ESL students
- Validate students home address

Closing/Wrap Up - 10 minutes

Take a moment to reflect on the lesson of the day and pick one of the following closure activities as time permits.

Examples:

- Repeat the Lesson Review,
- Use an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?
- Ask students to explain the relevance of the concept to their life or how they might use it.

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 17

Topic/Lesson Title & Grade Results #: Lesson #7 – Solving Quadratic Equations

Objective(s)

- The student will be able to solve quadratic equations.
- The student will be able to apply quadratic equations to real-life problems.

Guiding Question(s)

- How can you find a solution to a quadratic equation algebraically and graphically?
- How can you determine the axis of symmetry and the vertex of a parabola?
- How does understanding how to find the vertex of a quadratic function help in making decisions in real-life applications?

TN Curriculum Standard(s)

- A1.A.REI.B.3 - Solve quadratic equations and inequalities in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil, or notes in Grade Results

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students to stay focused and engaged in the learning process.

Attendance in PowerSchool – 5 minutes

Key Vocabulary/Terms- 5 minutes

Slide 15 - As a whole group, Define and discuss the meaning of the vocabulary words.

- Quadratic equation: A polynomial equation in which the highest power of the variable is two.

Lesson Introduction (I Do) – 35 minutes

- **Slide 1** – The students will state the objectives.
- **Slide 2** – The teacher will introduce quadratic equations by connecting parabolas to real life.
- **Slide 3** – The teacher will discuss solving quadratic equations of the form $x^2 = c$. Play the video.
- **Slide 4** – The teacher will model example 1 (solving quadratic equations of the form $x^2 = c$). Play the video.
- **Slide 5** – The teacher will model examples 2 and 3 (solving quadratic equations of the form $x^2 = c$). As a whole group, complete and discuss the activity on the slide.
- **Slide 6** – The teacher will model examples 4 and 5 (solving quadratic equations of the form $x^2 = c$).
- **Slide 7** – As a whole group, complete the activity. Discuss.
- **Slide 8** – The teacher will model example 6 (solving quadratic equations of the form $ax^2 - d$). Play the video.
- **Slide 9** – The teacher will model example 7 (solving quadratic equations of the form $ax^2 - d$). As a whole group, complete and discuss the activity.

- **Slide 10** – The teacher will model example 8 (solving quadratic equations of the form $ax^2 - d$). Play the video.
- **Slide 11** – The teacher will discuss quadratic equations in real life.
- **Slide 12** – The teacher will model example 8 (real life examples-quadratic equations). As a whole group, complete and discuss the video.
- **Slide 13** - As a whole group, complete the activity. Discuss.

Lesson Activities (We Do) – 15 minutes

All activities are within the grade results lesson and should be completed as they appear in the lesson. As a whole group, complete the Practice Activities. These activities are listed in the slides above.

Lesson Review – 15 minutes

Slide 14 - Summarize the lesson with lesson review in Grade Results. Students can ask questions or review previous slides for a better understanding of the material prior to moving on to the independent work.

- The standard form of the quadratic equation is $ax^2 + bx + c = 0$, where $a \neq 0$; a , b , and c are real numbers.
- If c is positive in $x^2 = c$, then it has two solutions. i.e., $x = \pm\sqrt{c}$
- If c is negative in $x^2 = c$, then it has no real solutions.
- If c is zero in $x^2 = c$, then it has only one solution. i.e., $x = 0$.

Independent Work – Posttest (They Do) – 40 minutes

Explain that students will work independently to complete the post-test. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson. All students are required to complete student activities as part of their class assignments.

While students are working on independent work, teachers can:

- Validate all posttests are completed.
- Update and resolve any discrepancies in Parent Contact Logs and Communication Notes
- Validate all supporting documentation for Special Education and ESL students
- Validate students home address

Closing/Wrap Up - 5 minutes

Take a moment to reflect on the lesson of the day and pick one of the following closure activities as time permits.

Examples:

- Repeat the Lesson Review
- Use an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?
- Ask students to explain the relevancy of the concept to their life or how they might use it.

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 18

Topic/Lesson Title & Grade Results #: Lesson #8 – Solving Quadratic Equation by Factoring

Objective(s)

- The student will recall quadratic equations.
- The student will be able to list down the steps involved in solving quadratic equations by factorization.
- The student will be able to solve quadratic equations by factorization method.

Guiding Question(s)

- How do you factor out the GCF of a quadratic function?
- How do you factor quadratic trinomial with a leading coefficient of one?
- How do you factor a quadratic trinomial with a leading coefficient not equal to one?
- How do you solve a quadratic equation by factoring?

TN Curriculum Standard(s)

- A1.A.REI.B.3 - Solve quadratic equations and inequalities in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil, or notes in Grade Results

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students to stay focused and engaged in the learning process.

Attendance in PowerSchool – 5 minutes

Key Vocabulary/Terms – 5 minutes

Slide 14 - As a whole group, Define and discuss the meaning of the vocabulary words.

- Quadratic equation: A polynomial equation in which the highest power of the variable is two.

Lesson Introduction (I Do) – 40 minutes

- **Slide 1** – The students will state the objectives
- **Slide 2** – The teacher will introduce quadratic equations. The teacher will give examples of quadratic equations. As a whole group, complete and discuss the activity.
- **Slide 3** – The teacher will discuss solutions of quadratic equations.
- **Slide 4** – The teacher will model example 1 (solving quadratic equations by factorization method).
- **Slide 5** – The teacher will model example 2 (solving quadratic equations by factorization method). As a whole group, complete and discuss the activity.
- **Slide 6** – The teacher will model example 3 (solving quadratic equations by factorization method). Play the video. As a whole group, complete and discuss the activity.
- **Slide 7** – The teacher will model example 4 (solving quadratic equations by factorization method). Play the video if time permits. As a whole group, complete and discuss the activity.
- **Slide 8** – As a whole group, complete and discuss the activity.

- **Slide 9** – The teacher will model example 5 (real life examples of quadratic equations). As a whole group, complete and discuss the activities.
- **Slide 10** - The teacher will model example 6 (real life examples of quadratic equations). As a whole group, complete and discuss the activities. Play the video if time permits.
- **Slide 11** – The teacher will model example 7 (real life examples of quadratic equations). As a whole group, complete and discuss the activities.
- **Slide 12** - As a whole group, complete and discuss the activity.

Lesson Activities (We Do) – 15 minutes

All activities are within the grade results lesson and should be completed as they appear in the lesson. As a whole group, complete the Practice Activities. These activities are listed in the slides above.

Supplemental (optional)

- A supplemental video is in grade results for additional support. Click on the “Supplemental” tab to find the video.

Lesson Review – 10 minutes

Slide 13 - Summarize the lesson with lesson review in Grade Results. Students can ask questions or review previous slides for a better understanding of the material prior to moving on to the independent work.

- A quadratic equation is an equation where the highest exponent of the variable is 2.
- The standard form of the quadratic equation is $ax^2 + bx + c = 0$, where $a \neq 0$; a , b , and c are real numbers.
- The steps involved in solving quadratic equation using the factorization method are:
 - Keep all the terms on one side and make the other side equal to zero.
 - Factor the expression.
 - Set each factor equal to zero.
 - Solve each equation.

Independent Work – Posttest (They Do) – 40 minutes

Explain that students will work independently to complete the post-test. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson. All students are required to complete student activities as part of their class assignments.

While students are working on independent work, teachers can:

- Validate all posttests are completed.
- Update and resolve any discrepancies in Parent Contact Logs and Communication Notes
- Validate all supporting documentation for Special Education and ESL students
- Validate students home address

Closing/Wrap Up - 5 minutes

Take a moment to reflect on the lesson of the day and pick one of the following closure activities as time permits.

Examples:

- Repeat the Lesson Review,
- Use an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?
- Ask students to explain the relevancy of the concept to their life or how they might use it.

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 19

Topic/Lesson Title & Grade Results #: Lesson #9 – Deriving the Quadratic Formula

Objective(s)

- The student will be able to explain the steps in deriving the quadratic formula.
- The student will be able to solve quadratic equations using the quadratic formula.

Guiding Question(s)

- What does the discriminant tell you about a quadratic equation?
- How do you solve a quadratic equation using the quadratic formula?
- How do you decide which method is best when solving quadratic equations?

TN Curriculum Standard(s)

- A1.A.REI.B.3 - Solve quadratic equations and inequalities in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil, or notes in Grade Results

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students to stay focused and engaged in the learning process.

Attendance in PowerSchool – 5 minutes

Key Vocabulary/Terms– 5 minutes

Slide 14 - As a whole group, Define and discuss the meaning of the vocabulary words.

- Quadratic equation: An equation that can be written in the form $ax^2 + bx + c = 0$, where $a \neq 0$.
- Quadratic formula: A formula that gives the solutions to the quadratic equation.
- Coefficient: A number multiplied with a variable.

Lesson Introduction (I Do) – 30 minutes

- **Slide 1** – The students will state the objectives.
- **Slide 2** – The teacher will introduce the quadratic formula and how quadratics are used in daily life.
- **Slide 3** – The teacher will discuss how to derive the quadratic function from $ax^2 + bx + c$.
- **Slide 4** – The teacher will discuss determining the nature of roots. Play the video.
- **Slide 5** – The teacher will model example 1 (determining the nature of roots). As a whole group, complete and discuss the activity.
- **Slide 6** – As a whole group, complete the activity. Discuss.
- **Slide 7** - The teacher will model example 2 (determining the nature of roots). Play the video if time permits.
- **Slide 8** – The teacher will model example 3 (quadratic equations in real world examples). As a whole group, complete and discuss the activity.
- **Slide 9** – The teacher will model example 4 (quadratic equations in real world examples). As a whole group, complete and discuss the activity. Play the video.
- **Slide 10** – The teacher will model example 5 (quadratic equations in real world examples). As a whole group, complete and discuss the activity. Play the video.

- **Slide 11** – As a whole group, complete the activity. Discuss.
- **Slide 12** – As a whole group, complete the activity. Discuss

Lesson Activities (We Do) – 20 minutes

All activities are within the grade results lesson and should be completed as they appear in the lesson. As a whole group, complete the Practice Activities. These activities are listed in the slides above.

Supplemental – Optional

- A supplemental video is in grade results for additional support. Click on the “Supplemental” tab to find the video.

Lesson Review – 15 minutes

Slide 13 - Summarize the lesson with lesson review in Grade Results. Students can ask questions or review previous slides for a better understanding of the material prior to moving on to the independent work.

- The standard form of a quadratic equation is $ax^2 + bx + c = 0$, where $a \neq 0$; a , b , and c are real numbers.
- The formula to find the solutions of a quadratic equation of the form $ax^2 + bx + c = 0$, is $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$.
- Discriminant, $\Delta = b^2 - 4ac$
- When $b^2 - 4ac = 0$, the roots are real and equal.
- When $b^2 - 4ac > 0$, the roots are real and distinct.
- When $b^2 - 4ac < 0$, the roots are complex.

Independent Work – Posttest (They Do) – 40 minutes

Explain that students will work independently to complete the post-test. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson. All students are required to complete student activities as part of their class assignments.

While students are working on independent work, teachers can:

- Validate all posttests are completed.
- Update and resolve any discrepancies in Parent Contact Logs and Communication Notes
- Validate all supporting documentation for Special Education and ESL students
- Validate students home address

Closing/Wrap Up – 5 minutes

Take a moment to reflect on the lesson of the day and pick one of the following closure activities as time permits.

Examples:

- Repeat the Lesson Review
- Use an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?
- Ask students to explain the relevancy of the concept to their life or how they might use it.

Summer School Lesson Plan

Subject/Grade: Algebra I

Day: 20

Topic/Lesson Title & Grade Results #: Post-Test Review & Post-Test

Objective(s): Students will review and complete all incomplete/missed/failed coursework.

Materials/Resources Needed: Grade Results Online Platform, Grade Results video, paper, pencil or notes in Grade Results

Technology: Computer, Whiteboard, TEAMS meeting (if applicable)

Break – 10 Minutes (Site Administrator will work with teachers on breaks)

- Teachers are allowed to include a 10-minute break during class time. This break can be used for students to get up and move around, stretch, or use the restroom. It can also be used for students to socialize or chat with their classmates. The break can help students stay focused and engaged in learning.

Attendance in PowerSchool – 5 minutes

Lesson Introduction (I Do) – 30 minutes

- Identify the purpose of the course
- Connect the course to missing or future coursework

Lesson Activities and Review (We Do) – 40 minutes

Check Grade Results and have students to review activities/lesson that they have not completed or need assistance with. Hold an open Q&A for students to ask questions regarding the activities/lessons they are reviewing.

Independent Work – Posttest (They Do) - 40 minutes

Students will review and complete any incomplete/missed/failed coursework.

While students are working on independent work, teachers can:

- Validate all posttest are completed.
- Update and resolve any discrepancies in Parent Contact Logs and Communication Notes
- Validate all supporting documentation for Special Education and ESL students
- Validate students home address

Closing/Wrap Up – 5 minutes