SUMMER SCHOOL TEACHER GUIDE

MATH/8th GRADE

Summer School
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Summer School Curriculum Guide

The Elementary and Middle Summer School Program will be for 20 days. Students will have a total of 18 daily lessons and day 19 and 20 will be for reviewing lessons/quizzes and post-test.

- Eighteen (18) days of daily lessons
- One (1) day post-test review and post-test
- One (1) day of reviewing lessons, retake daily post-tests, and makeup missed lessons.

All students and staff will use Grade Results for their summer curriculum. Each lesson will open daily, and students will not be able to work ahead; however, students can work on previously opened lessons. 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, then the teacher will have to open the lesson post-test again. Teachers should not delete any prior lesson post-test. Grade Results will post the highest grade from each students' lesson post-test.

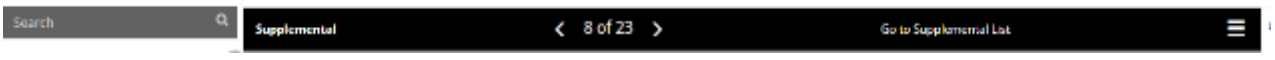
Classroom Schedule – *Time below is an approximate breakdown of time.*

- **Attendance in PowerSchool** – 5 minutes
- **Lesson Introduction** (I Do) – 5 minutes
- **Lesson Activities** (We Do) – 20 minutes
- **Supplemental** – 20 minutes (*BrainPOP, Flocabulary, Nearpod, Learn360, Others, etc.)*
- **Break – 10 Minutes** *(Site Administrator will work with teachers on breaks)*
- **Foundational or Practice Skills** – 30 minutes (Students will breakout for small group instruction.)
- **Teacher Lesson Review** – 5 minutes
- **Independent Work** – Student Lesson Review*/Post-Test (They Do) – 30 minutes
- **Closing/Wrap Up**– 5 minutes
- **Total Time: 2 hours 10 minutes**

***Lesson Review** – Students will review lesson 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:
  - Click on Supplemental
  - Click on Resource to view (Example: Flocabulary, BrainPOP, Others)
  - Teacher will review with the students the items that need to be completed.
  - Teachers can select additional Supplemental Resources as needed if time permits.
  - To view another resource once you are in a resource, use the Toggle Sidebar in the top right-hand corner. It has three dashes. An example is listed below.



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.

Anchor Charts – Some subjects may have Anchor Charts available with their lesson. **When there are two lessons, make sure you complete all components of Lesson A before transitioning to Lesson B. Times are estimated.**

Summer School Lesson Plan

Subject/Grade: 8th Grade Math **Day: 1**

Topic/Lesson Title & Grade Results #: Lesson 1 Understanding Rational Numbers (Lesson 1)

- **Objective(s): Students will** be able to Explain that numbers that are not rational are called irrational.
- Explain the decimal expansion of the real number system.
- Write a fraction or mixed number as a repeating decimal by a long division method.
- Write a repeating decimal as a fraction or mixed number in simplest form.
- Name all sets of numbers to which a given real number belongs.
- Convert a repeating decimal into a rational number.

Guiding Question(s): What is the difference between a rational number and irrational number?

TN Curriculum Standard(s): 8.NS.A.1

Standard Description(s): Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually or terminates and convert a decimal expansion which repeats eventually or terminates into a rational number.

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

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

Key Vocabulary/Terms:
Decimal Expansion: The decimal representation of numbers.
Decimal Number: A number that has a whole number part and a fractional part expressed as a series of numbers after the decimal point.
Decimal Point: A point or dot used to separate the whole number part from the fractional part.
Irrational Number: Any real number that cannot be written as a ratio of two integers. Irrational means "not rational." The decimal expansion of an irrational number is a non-terminating, nonrepeating decimal.
Rational Number: Any real number that can be written as a ratio of two integers with the denominator not equal to zero.
Repeating Decimal: A rational number in which the decimals repeat forever.
Real Number: Any number that can be found on the number line. This includes both rational and irrational numbers.

Take attendance in PowerSchool (5 minutes

Lesson Introduction (I Do):15 minutes
Please make sure you go over classroom expectations, procedures and rules. Also, introduce yourself and allow students to introduce themselves. The teacher will introduce the vocabulary. Then discuss the objective and guiding questions.
The teacher will introduce to students the two main ways numbers are classified -Rational and irrational numbers noting the different characteristics that make them distinctive. The student will be working on determining whether a number is rational or irrational.

Both Teacher and Student will work together reviewing examples and solving problems in the Activities and lessons in Grade Results slides 1-8.
Slide 1 the student will state Objective.
Slide 2 The teacher will review the Introduction.
Slide 3 The teacher will review Rational Numbers
Slide 4 The teacher will review Irrational Numbers
Slide 5 The student will view Video- Identifying Rational and Irrational Numbers
Slide 6 The student will view Video- Identifying Sets of Rational Number
Slide 7 The teacher will review Decimal Expansion of Real Number System
Slide 8 The teacher will review Decimal Expansion of Rational Numbers

Vocabulary: The Teacher will review and discuss the Key Vocabulary terms listed above with the student

Lesson Activities (We Do): 60 minutes (note: Supplemental times are embedded within in the 60 min)
Both Teacher and Student will work together reviewing examples and solving problems in the Activities and lessons in Grade Results, slides 9-17,19.
Slide 9 The student will complete Activity- Decimal Expansion
Slide 10 The teacher will review Finding Decimal Expansion of Rational Numbers
Slide 11 The student will complete Activity - Decimal Expansion
Slide 12 The teacher will review Decimal Expansion of Irrational Numbers
Slide 13 The teacher will review Convert Decimal Expansion into a Rational Number
Slide 14 The teacher and student will review Convert Decimal Expansion into a Rational Number
Slide 15 The teacher will review Conversion of a Non-terminating Decimal Expansion which Repeats Eventually into a Fraction
Slide 16 The teacher will review Conversion of a Non-terminating Decimal Expansion which Repeats Eventually into a Fraction
Slide 17 The student will complete Activity - Fraction to Decimal
Slide 18 The student will complete Drag and Drop Activity

Supplemental: See drop down menu to gain access: Then click on individual pages to access the slides
page1-Knowyourteams-rationalnumbersthis lesson from "Common Core Math," students will define and identify rational numbers, decimals, fractions and mixed numbers, compare and order positive and negative decimals and fractions using the number line, graph fraction and decimal coordinates on the coordinate plane, and determine the absolute value equivalents of negative decimals and fractions using real world examples.

Page2- Rational numbers We are Proportional- Starting with defining what are rational numbers, the program looks at computations with rational numbers, proportional reasoning and various applications of rational numbers.

Page3- Number Sets
This Khan Academy video reviews the different sets of numbers used by mathematicians, including natural numbers, whole numbers, integers, rational numbers, irrational numbers and real numbers. Three different number examples are assigned to the appropriate sets.

Additional Teacher Resources: Worksheet

Break: 10 minutes

Lesson Review: (5 Minutes) Summarize the lesson on Slide _19___, review terms and concepts and address student misconceptions.

Independent Work – Posttest (They Do): 30 minutes.

Have Students review the slides and their notes to prepare for the Posttest.
Explain to the students that they will be assessed and will work independently. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson.

Closing/Wrap Up/Notes Review: (5 minutes) Take a moment to reflect on the lesson of the day. Use as an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?

Summer School Lesson Plan

Subject/Grade: Math/ 8th Grade **Day: 2**

Topic/Lesson Title & Grade Results #: Properties of Exponents (Lesson 2)

Objective(s): Students will

- Write the properties of integer exponents.
- Write an expression using exponents.
- Simplify expressions by applying the properties of exponents.
- Write an expression using positive exponent and negative exponent.
- Find equivalent numerical expressions by their equivalence to a given expression.

Guiding Question(s): How can integer exponents generate equivalent numerical expressions?

TN Curriculum Standard(s): 8.EE.A.1

Standard Description(s):
Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} =$ \(\frac{1}{3^{3}}\) = \(\frac{1}{27}\).

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

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

Key Vocabulary/Terms:
Base: The number that has to be multiplied.
Exponent**:** A number that indicates how many times the base is to be used as a factor or multiplied by itself.

Take attendance in PowerSchool (5 minutes

Lesson Introduction (I Do): 15 minutes
The teacher will present and model for student using grade results integer exponents. The student will be engaged in activities and lessons guiding them how write and simplify integer exponents expressions, using slides 1-4.

Slide 1 The student will state the Objectives.
Slide 2 The teacher will Introduce the lesson by providing examples and simplifying exponent expressions.
Slide 3 The teacher will review Exponents and its forms.
Slide 4 The teacher will model Identifying Base and Exponent

Vocabulary: Grade Results Slide 21
The Teacher will review and discuss the Key Vocabulary terms listed above with the student.

Lesson Activities (We Do): 60 minutes.

Slide 5 The student will complete Activity - Exponent Form
Slide 6 The teacher will review Examples of Exponents
Slide 7 The student will complete Activity – Exponents
Slide 8 The student and teacher will complete Properties or Laws of Exponents
Slide 9 The teacher and student will review Simplifying Expressions using Laws of Exponents
Slide 10 The teacher and student will review Simplifying Expressions using Laws of Exponents
Slide 11 The teacher and student will review Activity - Simplifying Expressions using Laws of Exponents
Slide 12 The teacher and student will review Simplifying Expressions using Laws of Exponents

Slide 13 The teacher and student will review Simplifying Expressions using Laws of Exponents
Slide 14 the teacher and student will review Simplifying Expressions using Laws of Exponents
Slide 15 the teacher and student will review Simplify an Expression Using Multiple Laws of Exponents
Slide 16 the teacher and student will review Simplify an Expression Using Multiple Laws of Exponents
Slide 17 the teacher and student will review Writing Fraction as an Expression Using Negative Exponent
Slide 18 the student will complete Activity - Laws of Exponents
Slide 19 the student will complete Drag and Drop Activity

Supplemental: See drop down menu to gain access: Then click on individual pages to access the slides

Page 1: Exponent Rules-(2:29) This Khan Academy video explains how to simplify a numerical expression with exponents by using the multiplication property of exponents.
Page2:ExponentRules2-(3:58) This Khan Academy video shows how to compare two numerical expressions with exponents to find which is larger.
Page 3-Exponents Rule3(4:53)- This Khan Academy video shows how to simplify a numerical expression that uses exponents into simplified exponential form.
Page4-Exponents Properties (4:31)- This video from Mathispower4u demonstrates how to simplify an algebraic exponential expression using the properties of exponents.
Page5(2:36): Exponents Advanced-Properties-This Flocabulary-video covers advanced properties of exponents for students who have already learned the basics. It includes negative exponents, zero exponents and multiplying and dividing exponents. The song teaches students how to invert the expression when working with negative exponents. It also explains how to add or subtract the exponents when multiplying or dividing them.

Break: 10 minutes

Additional Teacher Resources: NONE

Lesson Review:(5 Minutes)
Summarize the lesson on Slide __20__, review terms and concepts and address student misconceptions.

Independent Work – Posttest (They Do) :(30 minutes)
Have Students review the slides and their notes to prepare for the Posttest.
Explain to the students that they will be assessed and will work independently. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson.

Closing/Wrap Up/Notes Review: (5 minutes)
Take a moment to reflect on the lesson of the day. Use as an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?

Summer School Lesson Plan

Subject/Grade: Math/8th **Day: 3**

Topic/Lesson Title & Grade Results #: Square Roots and Cube Roots (Lesson 3)

Objective(s): Students will be able to:

- Compute squares, square roots, cubes, and cube roots of given numbers.

Guiding Question(s): How do you determine the Square Root and Cube Root of a number?

TN Curriculum Standard(s): 8.EE.A.2

Standard Description(s):
Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

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

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

Key Vocabulary/Terms:
Squaring: The process of multiplying a number by itself.
Square root: The reverse process of squaring is called square root.
Radical symbol: The symbol √ is called the radical symbol which represents square root of a number.
Cube: The cube of a number is obtained by multiplying the number by itself thrice (3 times)
Root: A number which when cubed gives the original number.

Take attendance in PowerSchool (5 minutes

Lesson Introduction (I Do): (15 Minutes)
The Teacher will present and model using the following Grade Results lessons, slides 1-3,7-8 The teacher will demonstrate/ model for students the procedures taken to determine the square root or cube root of a number**,** the characteristics of a perfect square and that squaring and finding square root are inverse as well as cubing and finding the cube root.

Slide 1 the students will state Objectives.
Slide 2 The teacher will review the Introduction.
Slide 3 The teacher will review Square Root
Slide 7 the teacher will review Cube root.
Slide 8 the teacher will review Cube Root of a number.

Vocabulary: Grade Results Slide 15 The Teacher will review and discuss the Key Vocabulary terms listed above with the student

Lesson Activities (We Do): (60 Minutes)
Both Teacher and Student will work together reviewing examples and solving problems in the following activities and lessons in Grade Results using slides 4-6,9-13.
Slide 4 the teacher and student will complete Finding Square Root of a Number
Slide 5 the teacher and student will complete Finding Square Root of a Number
Slide 6 the teacher and student will complete Finding Square Root of a Number

Slide 9 the teacher and student will complete finding Cube Root of a Number
Slide 10 the teacher and student will complete Finding Cube Root of a Number
Slide 11 the teacher and student Finding Cube Root of a Number (Cont.)
Slide 12 the student will complete Activity - Square Root and Cube Root
Slide 13 the student will complete Drag and Drop Activity

Supplemental: See drop down menu to gain access: Then click on individual pages to access the slides.
Page1-Brain POP-Solving Square Root Equations (2:54)- This video explains how to solve quadratic equations by using square roots.

Additional Teacher Resources: NONE

Break: 10 minutes

Lesson Review:(5 minutes) Summarize the lesson on Slide _14___, review terms and concepts and address student misconceptions.

Independent Work – Posttest (They Do): (30 minutes)
Have Students review the slides and their notes to prepare for the Posttest.
Explain to the students that they will be assessed and will work independently. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson.

Closing/Wrap Up/Notes Review: (5 Minutes)
Take a moment to reflect on the lesson of the day. Use as an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?

Summer School Lesson Plan

Subject/Grade: Math/8th **Day: 4**

Topic/Lesson Title & Grade Results #: Evaluating Square Roots and Cube Roots (Lesson 4)

Objective(s): Students will be able to

- Find square roots and cube roots of numbers.
- Evaluate square roots of small perfect squares and cube roots of small perfect cubes.
- Estimate square roots and cube roots to the nearest integer.
- Solve equations of the form $x^2 = p$ and $x^3 = p$.
- Apply square roots and cube roots in finding the unknowns such as distance, missing parts of a right triangle, and the side length of a cube.
- Explain that √2 is an irrational number.

Guiding Question(s): How are the exponents square and cubed root utilized in finding the unknowns (i.e., distance, missing parts of triangles, etc.?

TN Curriculum Standard(s): 8.EE.A.2
Standard Description(s):
Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.

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

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

Key Vocabulary/Terms:
Cube Root: The cube root of a number is the value, that when used in multiplication three times gives the number.
Cubing a Number: A number is cubed when it is multiplied 3 times by itself.
Irrational Number: A real number that cannot be expressed as a fraction. Irrational numbers are non -repeating, non-terminating decimals.
Non-perfect Cube: A number that is not a perfect cube.
Non-perfect Square: A number that is not a perfect square.
Perfect **Cube:** A number that can be expressed as the product of three equal integers.
Perfect Square: A number that can be expressed as the product of two equal integers.
Rational Number: A number that can be written as a simple fraction, where the numerator and the denominator are integers, and the denominator is not 0.
Square Root: The square root of a number is a value that when multiplied by itself equals the original number.
Squaring a Number: A number is squared when it is multiplied by itself.

Take attendance in PowerSchool (5 minutes

Lesson Introduction (I Do): 15 Minutes
The Teacher will present and model Grade Results lessons and activities on Evaluating Square Roots and Cube Roots. The student will find square root and cube root of numbers and also find perfect square and cubes of numbers. The Teacher will use Grade Results slides 1-6.

Slide 1 the teacher will review Introductions.
Slide 2 the student will state the Objectives.

Slide 3 the teacher will Square of a number.
Slide 4 the teacher will review Perfect Squares or Square of a Number
Slide 5 the teacher will Square Root of a Number
Slide 6 the teacher will Finding Square of a Number

Vocabulary: Grade Results Slide 32 The Teacher will review and discuss the Key Vocabulary terms listed above with the student.

Lesson Activities (We Do): (60 minutes)
Both Teacher and Student will work together reviewing examples and solving problems in the following activities and lessons in Grade Results, slides 7-30.

Slide 7 the student will complete Activity - Finding Squares of Numbers
Slide 8 the teacher and student will review Finding Square Root of a Number
Slide 9 the teacher and student will review Equations Involving Square Roots
Slide 10 the teacher and student will review Solving Equations Involving Square Roots
Slide 11 the teacher and student will review Solving Equations Involving Square Roots (contd...)
Slide 12 the teacher and student will review Solving Equations Involving Square Roots (contd...)
Slide 13 the teacher and student will review Cube of a Number
Slide 14 the teacher and student will review Cube Root of a Number
Slide 15 the teacher and student will review Finding Cube of a Number
Slide 16 the student will complete Activity - Finding Cubes of Numbers
Slide 17 the teacher and student will review Finding Cube Root of a Number
Slide 18 the student will view Activity - Finding Cube Roots of Numbers
Slide 19 the teacher and student will review Equations Involving Cube Roots
Slide 20 the teacher and student will review Solving Equations Involving Cube Roots
Slide 21 the teacher and student will review Solving Equations Involving Cube Roots (cont.….)
Slide 22 the teacher and student will review Verbal Problems on Square Root of a Number
Slide 23 the student will view Video-Verbal Problems on Cube Root of a Number
Slide 24 the teacher and student will review Verbal Problems on Square Root of a Number
Slide 25 the teacher and student will review Applying Square Roots and Cube Roots in Finding the Unknowns
Slide 26 the student will view Video - The Distance Formula
Slide 27 the teacher and student will review Finding the Unknowns in a Right Triangle
Slide 28 the teacher and student will review Cube Roots in Finding Missing Values
Slide 29 the student will view the Video - Comparing and Ordering Real Numbers
Slide 30 the student will complete Drag and Drop Activity

Supplemental: See drop down menu to gain access: Then click on individual pages to access the slides
Page 1-This video explains how to solve quadratic equations by using square root (2:54)
Page 2-(optional)- Students can complete the odd numbered problems in this worksheet. Students will simplify expressions involving exponents, square roots and cube roots.

Additional Teacher Resources: NONE

Break: 10 minutes

Lesson Review: (5 minutes) Summarize the lesson on Slide __31__, review terms and concepts and address student misconceptions.

Independent Work – Posttest (They Do): (30 minutes)
Have Students review the slides and their notes to prepare for the Posttest.

Explain to the students that they will be assessed and will work independently. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson.

Closing/Wrap Up/Notes Review: 5 minutes

Take a moment to reflect on the lesson of the day. Use as an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?

Summer School Lesson Plan

Subject/Grade: Math/8th **Day: 5**

Topic/Lesson Title & Grade Results #: Order of Operations (Lesson 5)

Objective(s): Students will be able to Perform operations on integers.

Guiding Question(s): How are operations with integers performed mathematically?

TN Curriculum Standard(s): 8.EE.A.1.a

Standard Description(s):
Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} =$ \(\frac{1}{3^{3}}\) = \(\frac{1}{27}\).

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

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

Key Vocabulary/Terms:
Integers: A set of natural numbers, their negatives and zero.
Order of Operations: The order in which the operations should be performed within an expression.

Take attendance in PowerSchool (5 minutes

Lesson Introduction (I Do): 15 minutes
The Teacher will model and present to Students Grade Results Lessons/Activities performing order of operations on integers. The student will be engaged in lessons and activities providing instruction how operations with integers are performed mathematically.

Slide 1 the teacher will review Introduction.
Slide 2 the student will state Objective.
Slide 3 the teacher will review Adding Integers
Slide 4 the teacher Subtracting Integers
Slide 5 the teacher will review Multiplying and Dividing Integers

Vocabulary: Grade Results Slide 14. The Teacher will review and discuss the Key Vocabulary terms listed above with the student.

Lesson Activities (We Do): (60 minutes)
Both Teacher and Student will work together reviewing examples and solving problems in the following activities and lessons in Grade Results, slides 6-12.

Slide 6 the teacher and student will review Order of operations.
Slide 7 the teacher and student will review Order of Operations
Slide 8 the teacher and student will review Examples of Order of Operations
Slide 9 the teacher and student will review Evaluating Expressions
Slide 10 the teacher and student will review Evaluating Expressions
Slide 11 the teacher and student will review Evaluating Expressions
Slide 12 the student will complete Activity Lesson- Drop and Drag Activity

Supplemental: See drop down menu to gain access: Then click on individual pages to access the slides

Page 1- Applying the Order of Operations (4:21) Video Tips for Applying Order of Operations to Equations
Page 2- Worksheet-Have students complete the Journal and Cumulative Review

Additional Teacher Resources: NONE

Break: 10 minutes

Lesson Review: (5 minutes) Summarize the lesson on Slide __13__, review terms and concepts and address student misconceptions.

Independent Work – Posttest (They Do): (30 minutes)
Have Students review the slides and their notes to prepare for the Posttest.
Explain to the students that they will be assessed and will work independently. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson.

Closing/Wrap Up/Notes Review: (5 minutes)
Take a moment to reflect on the lesson of the day. Use as an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?

Summer School Lesson Plan

Subject/Grade: Math/8th **Day: 6**

Topic/Lesson Title & Grade Results #: Properties of Operations - Add, Subtract, Factor, and Expand Linear Expressions (Lesson 6)

Objective(s): Students will

add and subtract linear expressions with linear coefficients.

- Use properties of operations to add and subtract linear expressions.
- Factor and expand linear expressions with linear coefficients.

Guiding Question(s):
How can properties of operations be utilized to add, subtract, factor and expand Linear Expressions?

TN Curriculum Standard(s): 8.EE.C.7.b

Standard Description(s): Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms**.**

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

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

Key Vocabulary/Terms:
Algebraic expression: An expression consisting of at least one variable and also consists of numbers and operations.
Coefficient: A number multiplied by a variable in an algebraic expression.
Constant: A quantity having a fixed value that does not change or vary, such as a number. For example, 5 is the constant of $x + 5$.
Distributive property: The sum of two addends multiplied by a number is the sum of the product of each addend and the number.
Like terms: Terms in an algebraic expression that have the same variable raised to the same power.
Numerical expression: An expression consisting of numbers and operations.
Term: A number, a variable, or a product of a number and variables.
Variable: A symbol, usually a letter, used to represent one or more numbers

Take attendance in PowerSchool (5 minutes

Lesson Introduction (I Do): 15 minutes
The Teacher will model and present Grade Results Lessons/Activities on Properties of Operations - Add, Subtract, Factor, and Expand Linear Expressions**.** The student will solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. The Teacher will use Grade Results, slides 1-8, 11-13.

Slide 1 the student will state Objectives.
Slide 2 the teacher will review Introduction.
Slide 3 the teacher will review Algebraic Expression
Slide 4 the teacher will review Words to Symbols
Slide 5 the teacher will review Translating Verbal Phrases into Algebraic Expressions and Vice Versa
Slide 6 the teacher will review Number and Rational Expression
Slide 7 the teacher will review Arithmetic Operations on Algebraic Expressions

Slide 8 Properties of Operations in Algebraic Expressions
Slide 11 the teacher will review Applying Property of Operations in Expressions
Slide 13 the teacher will review Applying Property of Operations in Expressions (contd...)

Vocabulary: Grade Results Slide 23 The Teacher will review and discuss the Key Vocabulary terms listed above with the student

Lesson Activities (We Do): 60 minutes
Both Teacher and Student will work together reviewing examples and solving problems in the following activities and lessons in Grade Results, slides 6, 9-10, 14-21.

Slide 6 Activity - Translating Verbal Phrases into Algebraic Expressions
Slide 9 Simplifying Algebraic Expressions
Slide 10 the student will complete Activity - Simplifying Algebraic Expressions
Slide 14 the teacher and student will review Simplifying Algebraic Expressions
Slide 15 the teacher and student will review Expanding Linear Expressions
Slide 16 the student will complete Activity - Simplifying Algebraic Expressions
Slide 17 the teacher and student will review Real-life Examples on Simplifying Expressions
Slide 18 the student will complete Activity - Simplifying Algebraic Expressions
Slide 19 the student will complete Activity - Simplifying Algebraic Expressions
Slide 20 the student will complete Activity - Properties of Expressions.
Slide 21 the student will complete Activity- Drag and Drop

Supplemental: See drop down menu to gain access: Then click on individual pages to access the slides
Page 1- Flocabulary Video-This song defines the terms sum, difference, term, product, factor, quotient, coefficient, and variable. It also gives students some examples of these terms in action.

Additional Teacher Resources: NONE

Break: 10 minutes

Lesson Review: (5 Minutes) Summarize the lesson on Slide _22___, review terms and concepts and address student misconceptions.

Independent Work – Posttest (They Do): (30 minutes)
Have Students review the slides and their notes to prepare for the Posttest.
Explain to the students that they will be assessed and will work independently. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson.

Closing/Wrap Up/Notes Review: (5 Minutes) Take a moment to reflect on the lesson of the day. Use as an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?

Summer School Lesson Plan

Subject/Grade: Math/ 8th **Day: 7**

Topic/Lesson Title & Grade Results #: Solving Problems using Unit Rates (Lesson 7)

Objective(s): Students will

- Define unit rates.
- Find unit rates in verbal problems.
- Solve verbal problems involving unit price and constant speed.

Guiding Question(s): How can determining the unit rate be utilized to solve Verbal (word) problems?

TN Curriculum Standard(s): 8.EE.B.5

Standard Description(s):
Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

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

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

Key Vocabulary/Terms:
Ratio: Comparing two quantities of same type.
Rate: Comparing two quantities of different types.
Proportion: A proportion is when two ratios are equal.
Unit Rate: It is described as how many units of the first quantity to one unit of the second quantity.

Take attendance in PowerSchool (5 minutes

Lesson Introduction (I Do): 15 minutes.
The Teacher will model and present to Students Grade Results Lessons/Activities (slides 1-5) on Solving Problems using Unit Rates. The student will develop an understanding of unit rates and how unit rates are utilized in word problems.

Slide 1 the student will state the Objective.
Slide 2 the teacher will review Introduction.
Slide 3 the teacher will review Rate or Unit Rate
Slide 4 the teacher and student will complete Activity-Rates or Unit Rates (WE DO)
Slide 5 the teacher will review Finding Unit Rates

Vocabulary: Grade Results Slide 20 The Teacher will review and discuss the Key Vocabulary terms listed above with the student

Lesson Activities (We Do): (60 minutes) Finding Unit Rates (Contd…). 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 on slides 6-13, 15-18.

Slide 6 the teacher and student will review Activity Finding Unit Rates
Slide 7 the teacher and student will review Use Unit Rate to Find Other Values
Slide 8 the teacher and student will review Use Unit Rate to Find Other Values (contd...)
Slide 9 the student will complete Activity - Use Unit Rate to Find Other Values

Slide 10 the teacher and student will review Comparison of Unit Rates
Slide 11 the teacher and student will review Comparison of Unit Rates
Slide 12 the student will Activity-Comparison of Unit Rates
Slide 13 the teacher and student will review Real Life Problems on Constant Speed
Slide 15 the student will complete Activity - Real Life Problems on Constant Speed
Slide 16 the teacher and student will review Real Life Problems on Unit Pricing
Slide 18 the student will complete Activity- Drag and Drop

Supplemental: See drop down menu to gain access: Then click on individual pages to access the slides
Page 1: Unit Rates (2:38) The video discusses finding unit rate in real-life problems.
Page 2: Determining Unit Rates (1:32)- The video explains how to determine the unit rates in real-life problems.
Page 3: Rates-Flocabulary (3:25) -This Flocabulary video explains unit rates by a song.

Additional Teacher Resources: NONE

Break: 10 minutes

Lesson Review: (5 Minutes) Summarize the lesson on Slide _19___, review terms and concepts and address student misconceptions.

I**ndependent Work – Posttest (They Do): (30minutes)**
Have Students review the slides and their notes to prepare for the Posttest.
Explain to the students that they will be assessed and will work independently. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson.

Closing/Wrap Up/Notes Review: (5 minutes)
Take a moment to reflect on the lesson of the day. Use as an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?

Summer School Lesson Plan

Subject/Grade: Math/8th **Day: 8**

Topic/Lesson Title & Grade Results #: Compare Proportional Relationships Represented in Different Ways (Lesson8)

Objective(s): Students will

- Define unit rates.
- Find unit rates in verbal problems.
- Solve verbal problems involving unit price and constant speed.

Guiding Question(s): How do you interpret the unit as the slope of a graph?

TN Curriculum Standard(s): 8.EE.B.5
Standard Description(s):
Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

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

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

Key Vocabulary/Terms:
Ratio: Comparing two quantities of same type.
Rate: Comparing two quantities of different types.
Proportion: A proportion is when two ratios are equal.
Unit Rate: It is described as how many units of the first quantity to one unit of the second quantity.

Take attendance in PowerSchool (5 minutes

Lesson Introduction (I Do): 10 minutes
The Teacher will model and present to Students Grade Results Lessons/Activities Compare Proportional Relationships Represented in Different Ways. The student will find unit rates in verbal problems and solve verbal problems involving unit price and constant speed.

Slide 1 the student will state the Objectives.
Slide 2 the teacher will review Introduction.
Slide 3 the teacher will review Rate of Change
Slide 4 the teacher will review Slope.
Slide 5 the teacher will Proportional Linear Relationship

Vocabulary: Grade Results Slide 20 The Teacher will review and discuss the Key Vocabulary terms listed above with the student

Lesson Activities (We Do): 60 minutes
Both Teacher and Student will work together reviewing examples and solving problems in the following activities and lessons in Grade Results, slides 6-18.

Slide 6 the student and teacher will review Representation of Proportional Linear Relationships
Slide 7 the student will complete Activity - Proportional Linear Relationship
Slide 8 the student and teacher will review Determine Proportional Linear Relationship from Table of Values

Slide 9 the student will complete Activity - Proportional Linear Relationship
Slide 10 the student and teacher will review Determine Proportional Linear Relationship from Graphs
Slide 11 the student and teacher will review the student will complete Activity - Proportional Linear Relationship
Slide 12 the student and teacher will review Graphing an Equation of Proportional Relationship
Slide 13 the student and teacher will review Graphing an Equation of Proportional Relationship (contd…)
Slide 14 the student and teacher will review Comparing Proportional Linear Relationships in Different Forms
Slide 15 the student and teacher will review Comparing Proportional Linear Relationships in Different Forms
Slide 16 the student will complete Activity - Rate of Change
Slide 17 the student will complete Activity - Proportional Linear Relationship
Slide 18 the student will complete Drag and Drop Activity

Supplemental: (5 Minutes): See drop down menu to gain access: Then click on individual pages to access the slides
Page 1: Linear Equations (2:48)-In this Flocabulary video, a line teaches students about the properties of lines and linear equations. The song describes various properties of lines. They don't curve and only cross the x-axis and y-axis once each. The song also explains linear equations, x-intercept and y-intercept, slope, and how to find the slope-intercept form of a linear equation.

Additional Teacher Resources: NONE

Break: 10 minutes

Lesson Review: (5 Minutes) Summarize the lesson on Slide __19__, review terms and concepts and address student misconceptions.

Independent Work – Posttest (They Do): (30 minutes)
Have Students review the slides and their notes to prepare for the Posttest.
Explain to the students that they will be assessed and will work independently. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson.

Closing/Wrap Up/Notes Review: (5 minutes)
Take a moment to reflect on the lesson of the day. Use as an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?

Summer School Lesson Plan

Subject/Grade: Math/ 8th **Day: 9**

Topic/Lesson Title & Grade Results #: Solving Linear Equations (Lesson 9)

Objective(s): Students will

- Define equations.
- Understand the method of solving an equation.
- Determine whether the given number makes an equation true.

Guiding Question(s): What are the Various methods for solving equations and determining their solutions?

TN Curriculum Standard(s): 8.EE.C.7.a1

Standard Description(s):
Solve linear equations in one variable.
a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).

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

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

Key Vocabulary/Terms:
Inverse Operation: The operation that reverses the effect of another operation.
Equation: Two mathematical expressions equated to each other by equal to sign.
Expression: Combination of constants, variables, and arithmetic operators.
Solution of an Equation: Value or number which makes the equation true.
Variable: A letter or symbol that represents an unknown value.

Take attendance in PowerSchool (5 minutes

Lesson Introduction (I Do): (15 Minutes)
The Teacher will model and present to Students Grade Results Lessons/Activities (slides 1-7) Solving Linear Equations and how to determine the number of solutions an equation may have based on characteristics. The student will define equations, determine the method for determining the number of solutions it may have.

Slide 1 the student will state Objectives.
Slide 2 the teacher will review Introduction.
Slide 3 the teacher will review Equations.
Slide 4 the student will complete Activity - Equations and Expressions
Slide 5 the teacher will review Solving an Equation
Slide 6 the teacher will review Inverse Operations
Slide 7 the teacher will review Solutions to Equations

Vocabulary: Grade Results Slide 20 The Teacher will review and discuss the Key Vocabulary terms listed above with the student

Lesson Activities (We Do): 60 Minutes

Both Teacher and Student will work together reviewing examples and solving problems in the following activities and lessons in Grade Results, slides 8-18.

Slide 8 the teacher and student will review Properties of Equality
Slide 9 the teacher and student will review Solving Equations
Slide 10 the teacher and student will review Solving Equations
Slide 11 the student will complete Activity-Solving Equations
Slide 12 the teacher and student will review Solving Equations
Slide 13 the student will complete Activity - Solving Equations
Slide 14 the teacher and student will review Solving Multi-Step Equations
Slide 15 the student will complete Activity - Solving Multi-Step Equations
Slide 16 the teacher and student will review Problems on Solving Equations
Slide 17 the teacher and student will review Verbal Problems on Solving Equations
Slide 18 the student will complete Activity- Verbal Problems on Solving Equations

Supplemental: See drop down menu to gain access: Then click on individual pages to access the slides
Page 1: Equations- (2:38) Flocabulary
Page 2: Solving Equations by Inspection-(16:47) In this lesson from Algebra's Cool Module 3, students will solve algebraic equations "by inspection," write the solution to an equation in proper notation and check the solution to an equation.
Page3:Solving0ne-stepEquations-(9:49) -This video from Mathispower4u demonstrates how to solve a one-step linear equation in one variable by adding, subtracting, multiplying or dividing.

Additional Teacher Resources: NONE

Break: 10 minutes

Lesson Review: (5 Minutes) Summarize the lesson on Slide __19__, review terms and concepts and address student misconceptions.

Independent Work – Posttest (They Do): (30 minutes)
Have Students review the slides and their notes to prepare for the Posttest.
Explain to the students that they will be assessed and will work independently. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson.

Closing/Wrap Up/Notes Review: (5 Minutes)
Take a moment to reflect on the lesson of the day. Use as an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?

Summer School Lesson Plan

Subject/Grade: Math/8th **Day: 10**

Topic/Lesson Title & Grade Results #: Solving Linear Equations with Rational Number Coefficients (Lesson 10)

Objective(s): Students will

- Solve equations with rational number coefficients and constants.
- Solve multistep equations with rational number coefficients and constants.
- Create equivalent expressions by combining like terms and using the distributive property.

Guiding Question(s): How can the Distributive Property be used to solve linear equations with rational coefficients?

TN Curriculum Standard(s): 8.EE.C.7.b

Standard Description(s):

Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

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

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

Key Vocabulary/Terms:
Algebraic Expression: An expression consisting of variables, numbers, and operations.
Constant Term: A term that has a fixed value. A term that has no variables, so its value will not change.
Coefficient: The numerical factor in a term consisting of the product of a number and one or more variables.
Equation: A mathematical statement showing that two expressions are equal.
Like Terms: Terms that contain the same variables raised to the same power.
Linear Equation: An equation that represents a straight line.
Rational Number: A real number written as a ratio of integers with a non-zero denominator.
Rational Number Coefficient: A rational number placed in front of a variable.
Term: An expression consisting of a number or one or more variables or their product.
Variable: A letter or symbol that represents an unknown value.

Take attendance in PowerSchool (5 minutes

Lesson Introduction (I Do): (15 Minutes)
The Teacher will model and present to Students Grade Results Lessons/Activities (slides 1-4) Solving Linear Equations with Rational Number Coefficients. The student will solve equations and multistep equations with rational coefficients also Create equivalent expressions by combining like terms and using the distributive property.
Slide 1 the student will state Objectives.
Slide 2 the teacher will review Introduction.
Slide 3 the teacher will review Variables and Coefficients
Slide 4 the teacher will Algebraic Expressions

Vocabulary: Grade Results Slide 20 The Teacher will review and discuss the Key Vocabulary terms listed above with the student

Lesson Activities (We Do): (60 Minutes)
Both Teacher and Student will work together reviewing examples and solving problems in the following activities and lessons in Grade Results, slides 5-18.
Slide 5 the student will complete Activity - Algebraic Expressions Terms
Slide 6 the student will complete Activity- Like Terms
Slide 7 the teacher and student will review Linear Equations
Slide 8 the teacher and student will review Rational Numbers
Slide 9 the teacher and student will review Linear Equations with Rational Number Coefficients
Slide 10 the teacher and student will review Solving Linear Equations with Rational Number Coefficients
Slide 11 the teacher and student will review Solving Linear Equations with Constant
Slide 12 the teacher and student will review Solving Linear Equations with Rational Number Coefficients
Slide 13 the student will view Video - Solving Linear Equations with Rational Number Coefficients
Slide 14 the teacher and student will review Solving Linear Equations Using Distributive Property
Slide 15 the teacher and student will review Application Problems Using Linear Equations
Slide 16 the student will complete Activity 1- Drop and Drag
Slide 17 the student will complete Activity 2- Drop and Drag

Supplemental: See drop down menu to gain access: Then click on individual pages to access the slides
Page1: Linear Equations in the Real World (13:09)- This video from MyWhyU demonstrates how to write a linear equation to model the water depth in a pool as a function of time.
Page 2: Solving 2 step Linear Equations-Worksheet- Teacher has option of selecting 5 random problems to use.

Additional Teacher Resources: NONE

Break: 10 minutes

Lesson Review:(5 Minutes) Summarize the lesson on Slide __19__, review terms and concepts and address student misconceptions.

Independent Work – Posttest (They Do): (30 minutes)
Have Students review the slides and their notes to prepare for the Posttest.
Explain to the students that they will be assessed and will work independently. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson.

Closing/Wrap Up/Notes Review: (5 Minutes)
Take a moment to reflect on the lesson of the day. Use as an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?

Summer School Lesson Plan

Subject/Grade: Math/ 8th **Day: 11**

Topic/Lesson Title & Grade Results #: Nature of Solutions to Linear Equations in One Variable (Lesson 11)

Objective(s): Students will be able to:

Solve an equation using the properties of equality to justify the steps to the solution.
Translate a word phrase or real-world problem into an equation and solve it.
Solve equations with variables on both sides of the equal sign.
Classify equations by the number of solutions.
Determine the type of solutions (unique solution, no solution, and infinitely many solutions) in a linear equation.

Guiding Question(s): How can the number of solutions be determined in equations with variables on both sides?

TN Curriculum Standard(s): 8.EE.C.7.a2

Standard Description(s):
Solve linear equations in one variable.
a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).

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

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

Key Vocabulary/Terms:
- **Variable:** A letter or symbol used to represent an unknown number in an algebraic expression.
- **Equation:** A statement indicating that the values of two mathematical expressions are equal (indicated by the sign =).
- **Solving the equation:** Finding the value of unknown variable(s) in the equation.
- **Isolating the variable:** Using inverse operations to undo addition, subtraction, multiplication, and division to get the variable.

Take attendance in PowerSchool (5 minutes

Lesson Introduction (I Do): (15 Minutes)
The Teacher will model and present to Students the Grade Results Lessons/Activities (slides 1-6) Nature of Solutions to Linear Equations in One Variable. The student will solve equations with variables on both sides, solve real world word problems translating words into a math problem and classifying the number of solutions.

Slide 1 the student will state Objectives.
Slide 2 the teacher will review Introduction.
Slide 3 the teacher will review Equations.
Slide 4 the teacher will review Linear Equations with one Variables
Slide 5 the teacher will review Non-Linear Equations

Vocabulary: Grade Results Slide 27 The Teacher will review and discuss the Key Vocabulary terms listed above with the student

Lesson Activities (We Do): (60 minutes)

Both Teacher and Student will work together reviewing examples and solving problems in the following activities and lessons in Grade Results, slides 6-25.

Slide 6 the student will complete Activity - Linear or Non-linear Equations
Slide 7 the teacher and student will review Solving a Linear Equation
Slide 8 the teacher and student will review Solving and Checking the Solution
Slide 9 the student will complete Activity - Solving Equation
Slide 10 the teacher and student will review Classifying Equations by Number of Solutions
Slide 11 the teacher and student will review Properties of Equality in Solving a Linear Equation
Slide 12 the teacher and student will review Identifying the Type of Solution in a Linear Equation
Slide 13 the teacher and student will review Identifying the Type of Solution in a Linear Equation (contd...)
Slide 14 the teacher and student will review Identifying the Type of Solution in a Linear Equation (contd...)
Slide 15 Solving Linear Equation in One Variable
Slide 16 the teacher and student will review Solving Linear Equation in One Variable(contd)
Slide 17 the teacher and student will review Solving Linear Equation in One Variable
Slide 18 the teacher and student will review Solving Multi-Step Linear Equations in One Variable
Slide 19 the teacher and student will review Solving Linear Equations with Variables on Both Sides
Slide 20 the teacher and student will review Solving Linear Equations involving Fractions.
Slide 21 the teacher and student will review Solving Linear Equations involving Decimals.
Slide 22 the teacher and student will review Real Life Applications on Solving Linear Equations
Slide 23 the teacher and student will review Real Life Applications on Solving Linear Equations (contd…)
Slide 24 the student will complete Activity - Solving Equations
Slide 25 the student will complete Activity – Lesson- Drop and Drag

Supplemental: See drop down menu to gain access: Then click on individual pages to access the slides
Page 1: Solving Equations by Inspection (16:47)- n this lesson from Algebra'scool Module 3, students will solve algebraic equations "by inspection," write the solution to an equation in proper notation and check the solution to an equation.
Page 2: Solving One Step Linear Equations-(22:11**)** In this lesson from Algebra'scool Module 3, students will solve one-step equations using addition and subtraction, solve one-step equations using multiplication and division and check solutions to one-step equations.
Page 3: More Involved MultiStep Equations (5:36) This Khan Academy video demonstrates how to solve a multi-step linear equation with a variable term on both sides of the equal sign and requiring use of the distributive property to isolate the variable on one side of the equation.
Page 4: Solving One-Step Equations (9:49**)** This video from Mathispower4u demonstrates how to solve a one-step linear equation in one variable by adding, subtracting, multiplying or dividing.

Additional Teacher Resources: NONE

Break: 10 minutes

Lesson Review: (5 minutes) Summarize the lesson on Slide _26___, review terms and concepts and address student misconceptions.

Independent Work – Posttest (They Do) :(30 minutes)
Have Students review the slides and their notes to prepare for the Posttest.
Explain to the students that they will be assessed and will work independently. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson.

Closing/Wrap Up/Notes Review: (5 Minutes)
Take a moment to reflect on the lesson of the day. Use as an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?

Summer School Lesson Plan

Subject/Grade: Math/8th **Day: 12**

Topic/Lesson Title & Grade Results #: Relations and Functions (Lesson 12)

Objective(s): Students will

Define a relation and function.
Explain that a function is a rule.
Explain that the graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
Determine if a given relation is a function, and a set of points in the plane represent a function or not.
Find the domain and range; and evaluate the function for the given value.

Guiding Question(s): How do you determine if a relation is a function? What are the characteristics of a graph representing a function?

TN Curriculum Standard(s): 8.F.A.1

Standard Description(s):
Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.

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

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

Key Vocabulary/Terms:
Domain: The set of all input or x values.
Function: A mathematical rule that assigns exactly one output (or y value) to each input (or x value).
Range: The set of all output or y values.
Relation: A set of ordered pairs.

Take attendance in PowerSchool (5 minutes

Lesson Introduction (I Do): (15 minutes)
The Teacher will model and present to Students Grade Results Lessons/Activities (slides 1-7) Relations and Functions. The students will define a relation and functions, determine if a relation is a function and learn the characteristics of a graph representing a function.

Slide 1 the student will state Objective.
Slide 2 the teacher will review Introduction.
Slide 3 teacher will review Relations.
Slide 4 teacher will review Function is a Rule
Slide 5 teacher will review Domain and Range
Slide 6 teacher will review Finding Domain and Range
Slide 7 teacher will review Finding Domain and Range

Vocabulary: Grade Results Slide 19 The Teacher will review and discuss the Key Vocabulary terms listed above with the student

Lesson Activities (We Do): (60 minutes)
Both Teacher and Student will work together reviewing examples and solving problems in the following activities and lessons in Grade Result, slides 8-17.

- Slide 8 the student will complete Activity - Domain and Range
- Slide 9 the teacher and student will review Representation of Functions
- Slide 10 the teacher and student will review Activity - Representation of Functions
- Slide 11 the teacher and student will review Evaluating Functions
- Slide 12 the teacher and student will review Evaluating Functions
- Slide 13 the teacher and student will review Evaluating Functions
- Slide 14 the teacher and student will review Evaluating Functions
- Slide 15 the student will complete Activity 1 - Evaluating Functions
- Slide 16 the student will complete Activity 2 - Evaluating Functions
- Slide 17 the student will complete Activity Lesson

Supplemental: See drop down menu to gain access: Then click on individual pages to access the slides
Page 1: Writing Functions from Patterns (20:16)- In this lesson from Algebra'scool Module 9, students write function rules for linear patterns and for nonlinear patterns.
Page 2: Functions and Relations (22:02)- Join our hosts as they build tables and map diagrams and graphs -- all of them different ways to represent functions and relations. Discover the vertical line test -- a visual way of determining whether or not a relation is a function. It's everything from domain and range to the famed f(x) and more in this engaging program designed to help students expand their understanding of algebra. Part of the multivolume Algebra for Students series. Includes a teacher's guide and guided practice worksheet.
Page 3: Functions (6:26) This video from MyWhyU defines a function and explains functions in terms of input, output, domain, codomain and range.

Additional Teacher Resources: NONE

Break: 10 minutes

Lesson Review: (5 Minutes) Summarize the lesson on Slide _18___, review terms and concepts and address student misconceptions.

Independent Work – Posttest (They Do): (30 minutes)
Have Students review the slides and their notes to prepare for the Posttest.
Explain to the students that they will be assessed and will work independently. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson.

Closing/Wrap Up/Notes Review: (5 minutes)
Take a moment to reflect on the lesson of the day. Use as an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?

Summer School Lesson Plan

Subject/Grade: Math/8th **Day: 13**

Topic/Lesson Title & Grade Results #: Comparing Properties of Linear Functions (Lesson 13)

Objective(s): Students will

- Define slope and its types.
- Translate among representations of functions.
- Determine the properties of a function from a verbal description, table, graph, or algebraic form.
- Make comparisons between the properties of two functions represented differently.

Guiding Question(s): How can the rate of change be determined and expressed in terms of slope?

TN Curriculum Standard(s): 8.F.A.2

Standard Description(s):
Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.

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

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

Key Vocabulary/Terms:
Linear Function: An equation that when graphed, makes a straight line.
Rate of Change: The ratio of the change in the output values in relation to the change in the input values; the slope of a linear function.
Slope: A number that describes both the steepness and direction of a line.

Take attendance in PowerSchool (5 minutes

Lesson Introduction (I Do): (15 Minutes)
The Teacher will model and present to Students Grade Results Lessons/Activities (slides 1-4) Comparing Properties of Linear Functions. The students will define Slope, translate among representations and determine the properties of a function from a verbal description, table, graph, or algebraic form.

Slide 1 the student will state Objective.
Slide 2 the teacher and student will review Introduction.
Slide 3 the teacher will review Representation of Functions
Slide 4 the teacher will review Linear Functions in other forms.

Vocabulary: Grade Results Slide 20 The Teacher will review and discuss the Key Vocabulary terms listed above with the student

Lesson Activities (We Do): (60minutes)
Both Teacher and Student will work together reviewing examples and solving problems in the following activities and lessons in Grade Results, slides 5-18.

Slide 5 the student will complete Activity - Algebraic Forms of Linear Functions
Slide 6 the teacher and student will review Classification of Slopes
Slide 7 the teacher and student will review Translate among Representations of Functions
Slide 8 the teacher and student will review Determine Properties of Linear Function from Different Forms
Slide 9 the teacher and student will review Properties of Linear Functions
Slide 10 the student will complete Activity - Slopes of Two Linear Functions
Slide 11 the teacher and student will review Comparison of Linear Functions in Algebraic Form
Slide 12 the teacher and student will review Comparison of Linear Functions in Table and Algebraic Form
Slide 13 the teacher and student will review Comparison of Linear Functions in Graph and Algebraic Form
Slide 14the student will complete Activity - Comparison of Linear Functions
Slide 15 the teacher and student will review Comparison of Linear Functions in Table and Graph
Slide 16 the teacher and student will review Comparison of Linear Functions in Table and Graph
Slide 17 the teacher and student will review Comparison of Linear Functions in Verbal Form
Slide 18 the student will complete Activity - Comparison of Linear Functions

Supplemental: See drop down menu to gain access: Then click on individual pages to access the slides
Page 1: Linear Equations (24:20) This video demonstrates how to find the slope from the linear functions.
Page 2: Slope of Parallel and Perpendicular lines (2:42)- This video explains how to find the slopes of parallel and perpendicular lines.

Additional Teacher Resources:

Break: 10 minutes

Lesson Review: (5 Minutes) Summarize the lesson on Slide _19___, review terms and concepts and address student misconceptions.

Independent Work – Posttest (They Do): (30 Minutes)
Have Students review the slides and their notes to prepare for the Posttest.

Explain to the students that they will be assessed and will work independently. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson.

Closing/Wrap Up/Notes Review: (5 Minutes)
Take a moment to reflect on the lesson of the day. Use as an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?

Summer School Lesson Plan

Subject/Grade: Math /8th **Day: 14**

Topic/Lesson Title & Grade Results #: Linear and Non-linear Functions (Lesson 14)

Objective(s): Students will
Identify the rate of change between input and output values.
Interpret the equation of the form $y = mx + b$ as a linear function.
Provide examples of relationships that are non-linear functions.
Create a table of values that can be defined as non-linear functions.
Analyze rates of change to determine linear and non-linear functions.
Determine the rate of change from equations in forms other than the slope-intercept form.

Guiding Question(s): How can comparisons be made between the properties of two functions represented differently?

TN Curriculum Standard(s): 8.F.A.2
Standard Description(s):
Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.

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

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

Key Vocabulary/Terms:
Graph: A diagram showing the relation between two variable quantities, each measured along one of the pair of axes.
Linear: An equation whose graph is a straight line.
Non-linear: An equation whose graph is not a straight line.
Slope: The steepness of a line expressed as a ratio, using any two points on the line.

Take attendance in PowerSchool (5 minutes

Lesson Introduction (I Do): (15 Minutes)
The Teacher will model and present to Students Grade Results Lessons/Activities Linear and Non-linear Functions. The Have Students state the objectives. The Teacher will discuss and demonstrate the lesson using Grade Results, slides 1-7.

Slide 1 the student will state Objectives.
Slide 2 the teacher will review Introduction.
Slide 3 the teacher will review Functions and it Types.
Slide 4 the teacher will review Linear Functions
Slide 5 the teacher will review on-Linear Functions
Slide 6 the teacher will review Identifying Functions from a Graph
Slide 7 the teacher will review Identifying Functions from a Graph

Vocabulary: Grade Results Slide 16 The Teacher will review and discuss the Key Vocabulary terms listed above with the student

Lesson Activities (We Do): (60 Minutes)
Both Teacher and Student will work together reviewing examples and solving problems in the following activities and lessons in Grade Results, slides 8-18.

Slide 8 the student will complete Activity - Identifying Functions
Slide 9 the teacher and student will review Difference Between Linear and Non-Linear Functions
Slide 10 the teacher and student will review Graphs of Linear Functions
Slide 11 the teacher and student will review Determine Slope from Equations Other than Slope-Intercept Form
Slide 12 the teacher and student will review Identifying Rate of Change From Input and Output Values
Slide 13 the teacher and student will review Table of Values Representing Non-Linear Functions
Slide 14 the student will complete Activity - Identifying Functions From Table of Values
Slide 15 the teacher and student will review Examples Representing Linear and Non-Linear Relationships
Slide 16 the student will complete Activity - Identifying Functions From Table of Values
Slide 17 the student will complete Activity - Determining Rate of Change
Slide 18 the student will complete Activity - Terminologies

S**upplemental: See drop down menu to gain access: Then click on individual pages to access the slides**
Page 1: Writing the Equation of a line given two points on a line (4:00)- The below video explains how to write equations of lines using the slope-intercept form when given the slope of the line and a point on the line or when given two points on the line.
Page 2: Determine the exponential function given two points (6"22)- The below video demonstrates how to determine an exponential function that passes through two given points and then evaluate the function for a specific value.

Additional Teacher Resources: NONE

Break: 10 minutes

Lesson Review: (5 Minutes) Summarize the lesson on Slide _15___, review terms and concepts and address student misconceptions.

Independent Work – Posttest (They Do): (30 Minutes)

Have Students review the slides and their notes to prepare for the Posttest.

Explain to the students that they will be assessed and will work independently. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson.

Closing/Wrap Up/Notes Review: (5 minutes)
Take a moment to reflect on the lesson of the day. Use as an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?

Summer School Lesson Plan

Subject/Grade: Math/8th **Day: 15**

Topic/Lesson Title & Grade Results #: The Pythagorean Theorem (Lesson 15)

Objective(s): Students will

- Apply the Pythagorean Theorem to find an unknown side length of a right triangle.
- Use the Pythagorean Theorem in a diagram to solve real-world problems involving right triangles.
- Find right triangles in a three-dimensional figure.
- Use the Pythagorean Theorem to calculate various dimensions of right triangles found in a three-dimensional figure.
- Provide answers as whole numbers and irrational numbers approximated to three decimal places with the use of a calculator.

Guiding Question(s): How can the Pythagorean Theorem be utilized in real world problems to find unknown side lengths in right triangles?

TN Curriculum Standard(s): 8.G.B.5

Standard Description(s):
Know and apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

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

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

Key Vocabulary/Terms:
Right Triangle: A triangle containing exactly one 90° angle. The sum of the other two angles must total to 90°.
Hypotenuse of a Right Triangle: The longest side in a right triangle, which is also opposite to the right angle.
Legs of a Right Triangle: The two adjacent sides of 90° in a right triangle.

Take attendance in PowerSchool (5 minutes)

Lesson Introduction (I Do): (15 Minutes)

- **The Teacher will model and present to Students Grade Results Lessons/Activities (slides 1-6) The Pythagorean Theorem. The student will Apply the Pythagorean Theorem to find an unknown side length of a right triangle. Use the Pythagorean Theorem in a diagram to solve real-world problems involving right triangles.**
- **Find right triangles in a three-dimensional figure. Use the Pythagorean Theorem to calculate various dimensions of right triangles found in a three-dimensional figure. Provide answers as whole numbers and irrational numbers approximated to three decimal places with the use of a calculator.**

  Slide 1 the student will state Objectives.
  Slide 2 the teacher will review Introduction.
  Slide 3 the teacher will review The Pythagorean Theorem
  Slide 4 the teacher will review Proof of The Pythagorean Theorem
  Slide 5 the teacher will review Formal Proof of The Pythagorean Theorem
  Slide 6 the teacher will review Informal Proof of The Pythagorean Theorem

Vocabulary: Grade Results Slide 16 The Teacher will review and discuss the Key Vocabulary terms listed above with the student

Lesson Activities (We Do): (60 Minutes) Both Teacher and Student will work together reviewing examples and solving problems in the following activities and lessons in Grade Results, slides 6-14.

Slide 6 the teacher and teacher will review Proof of The Pythagorean Theorem
Slide 7 the student will complete Activity - The Pythagorean Theorem
Slide8 the teacher and student will review Apply the Pythagorean Theorem in Finding the Missing Side
Slide 9 the teacher will and student will review Provide Answers as Whole Numbers and Irrational Numbers
Slide 10 the student will view Video - Find the Missing Side Using Calculator
Slide 11 the teacher and student will review Use Pythagorean Theorem in a Diagram to Solve Real-world Problem
Slide 12 the teacher and student will review Right Triangles in Three Dimensional Figures
Slide 13 the student will complete Activity - Height of the Pyramid using Pythagorean Theorem
Slide 14 the student will Drag and Drop Activity

Supplemental: See drop down menu to gain access: Then click on individual pages to access the slides
Page 1: Challenging Student to Discover Pythagoras (8:53)-a video demonstrating some strategies for helping students learn about the Pythagorean Theorem, including activating background knowledge on the properties of squares and triangles and sharing methods for determining the area of a square drawn on the hypotenuse of a right triangle.
Page 2: Pythagorean Theorem (2:50)- Flocabulary-The Pythagorean theorem provides a formula to calculate the third side of a triangle when given the other two sides. The formula can be used for any side of any right triangle. The song also introduces students to terms like legs and hypotenuse. This video puts the Pythagorean theorem in real-world terms, helping students visualize examples in which the formula comes into play.

Additional Teacher Resources: NONE

Break: 10 minutes

Lesson Review: (5 Minutes) Summarize the lesson on Slide _15___, review terms and concepts and address student misconceptions.

Independent Work – Posttest (They Do): (30 Minutes)
Have Students review the slides and their notes to prepare for the Posttest.
Explain to the students that they will be assessed and will work independently. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson.

Closing/Wrap Up/Notes Review: (5 minutes)
Take a moment to reflect on the lesson of the day. Use as an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?

Summer School Lesson Plan

Subject/Grade: Math/8th **Day: 16**

Topic/Lesson Title & Grade Results #: Formal and Informal Proofs of Pythagorean Theorem (Lesson 16)

Objective(s): Students will

- Define the Pythagorean Theorem.
- Prove the Pythagorean Theorem formally and informally.
- Solve a few problems involving the Pythagorean Theorem.

Guiding Question(s): How can you prove the Pythagorean Theorem formally and informally?

TN Curriculum Standard(s): 8.G.B.4

Standard Description(s):
Explain a proof of the Pythagorean Theorem and its converse.

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

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

Key Vocabulary/Terms:
Formal Proof: A finite sequence of sentences each of which are axioms or follows from the preceding sentences in the sequence by a rule of inference.
Hypotenuse: The longest side which is opposite to the right angle in a right triangle.
Informal Proof: A proof written in the form of a paragraph, but not necessarily step by step. Legs: The sides of the right triangle that form the right angle.
Right Angle: An angle that measures 90°.

Take attendance in PowerSchool (5 minutes)

Lesson Introduction (I Do): (15 Minutes)

The Teacher will model and present to Students Grade Results Lessons/Activities (slides 1-8) Formal and Informal Proofs of Pythagorean Theorem. The students will define the Pythagorean Theorem prove the Pythagorean Theorem formally and informally and solve a few problems involving the Pythagorean Theorem.

Slide 1 the student will state the Objectives.
Slide 2 the teacher will review Introduction.
Slide 3 the teacher will review The Pythagorean Theorem
Slide 4 the teacher will review Proof of The Pythagorean Theorem
Slide 5 the teacher will review Formal Proof of The Pythagorean Theorem
Slide 6 the teacher will review Informal Proof of The Pythagorean Theorem
Slide 7 the teacher will review Solving Problems involving Pythagorean Theorem
Slide 8 the teacher will review Solving Problems involving Pythagorean Theorem

Vocabulary: Grade Results Slide 16 The Teacher will review and discuss the Key Vocabulary terms listed above with the student

Lesson Activities (We Do): (60 minutes)

Both Teacher and Student will work together reviewing examples and solving problems in the following activities and lessons in Grade Results, slides 9-14.

Slide 9 the student will complete Activity - Applying the Pythagorean Theorem
Slide 10 the teacher and student will review Verbal Problems on Pythagorean Theorem
Slide 11 the teacher and student will review Verbal Problems on Pythagorean Theorem
Slide 12 the teacher and student will review Verbal Problems on Pythagorean Theorem
Slide 13 the student will complete Activity – Application
Slide 14 the student will complete Activity -Lesson- Drop and Drag

Supplemental: See drop down menu to gain access: Then click on individual pages to access the slides
Page 1: Right Triangles-(27:41)- In this lesson from Math'scool Module 8, students prove and use the Pythagorean Theorem and use special right triangles to solve real-life problems.
Page 2: Prove it Pythagorean Theorem (29:31)- In this lesson from "Common Core Math," students will prove the Pythagorean Theorem and its converse and apply the Pythagorean Theorem and its converse to determine unknown lengths in two and three dimensions using real world examples.
Page 3: Right Triangle-Worksheet- In this worksheet, students prove and use the Pythagorean Theorem and use special right triangles to solve real-life problems. **Students will answer questions in Subpart 1**

Additional Teacher Resources: NONE

Break: 10 minutes

Lesson Review: (5 Minutes) Summarize the lesson on Slide _15___, review terms and concepts and address student misconceptions.

Independent Work – Posttest (They Do): (30 Minutes)
Have Students review the slides and their notes to prepare for the Posttest.
Explain to the students that they will be assessed and will work independently. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson.

Closing/Wrap Up/Notes Review: (5 minutes)
Take a moment to reflect on the lesson of the day. Use as an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?

Summer School Lesson Plan

Subject/Grade: Math/8th **Day: 17**

Topic/Lesson Title & Grade Results #: Proof of Pythagorean Theorem and its Converse (Lesson 17)

Objective(s): Students will

- Define the Pythagorean Theorem and its converse.
- Prove the Pythagorean Theorem and the converse of the Pythagorean Theorem formally and informally.
- Use algebraic reasoning to relate a visual model to the Pythagorean Theorem.
- Explain why the Pythagorean Theorem hold.

Guiding Question(s): How can you utilize algebraic reasoning to relate a visual model to the Pythagorean Theorem?

TN Curriculum Standard(s): 8.G.B.4

Standard Description(s):
Explain a proof of the Pythagorean Theorem and its converse.

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

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

Key Vocabulary/Terms:
Formal Proof: A finite sequence of sentences each of which are axioms or follows from the preceding sentences in the sequence by a rule of inference.
Hypotenuse: The longest side which is opposite to the right angle in a right triangle.
Informal Proof: A proof written in the form of a paragraph, but not necessarily step by step. Legs: The sides of the right triangle that form the right angle.
Right Angle: An angle that measures 90°

Take attendance in PowerSchool (5 minutes)

Lesson Introduction (I Do): (15 Minutes)

The Teacher will model and present to Students Grade Results Lessons/Activities (slides 1-6) Proof of Pythagorean Theorem and its Converse. The students will Define the Pythagorean Theorem and its converse, prove the Pythagorean Theorem and the converse of the Pythagorean Theorem formally and informally, use algebraic reasoning to relate a visual model to the Pythagorean Theorem

Slide 1 the student will state the Objectives.
Slide 2 the teacher will review Introduction.
Slide 3 the teacher will review The Pythagorean Theorem
Slide 4 the teacher will review Proof of The Pythagorean Theorem
Slide 5 the teacher will review Formal Proof of The Pythagorean Theorem
Slide 6 the teacher will review Informal Proof of the Pythagorean Theorem

Vocabulary: Grade Results Slide 20 The Teacher will review and discuss the Key Vocabulary terms listed above with the students

Lesson Activities (We Do): (60 Minutes)
Both Teacher and Student will work together reviewing examples and solving problems in the following activities and lessons in Grade Results, slides 7-18.

Slide 7 the teacher will review Converse of the Pythagorean Theorem
Slide 8 the student will view Video-Converse of the Pythagorean Theorem
Slide 9 the teacher will review Applying Converse Theorem in Determining the Triangles
Slide 10 the student will view Video-Converse of the Pythagorean Theorem
Slide 11 the teacher will review Find the Missing Side using the Pythagorean Theorem
Slide 12 the teacher will review Solving Problems involving the Pythagorean Theorem
Slide 13 the student will complete Activity - Applying the Pythagorean Theorem
Slide 14 the teacher will review Verbal Problems on Pythagorean Theorem
Slide 15 the teacher will review Length of the Ladder using the Pythagorean Theorem
Slide 16 the teacher will review Word Problems on Pythagorean Theorem
Slide 17 the student will complete Activity – Application
Slide 18 the student complete Activity – Lesson- Drop and Drag

Supplemental: See drop down menu to gain access: Then click on individual pages to access the slides
Page 1: Right Triangles (27:41)-In this lesson from Math'scool Module 8, students prove and use the Pythagorean Theorem and use special right triangles to solve real-life problems.
Page 2 Prove-it Pythagorean Theorem (29:31)- In this lesson from "Common Core Math," students will prove the Pythagorean Theorem and its converse and apply the Pythagorean Theorem and its converse to determine unknown lengths in two and three dimensions using real world examples.

Additional Teacher Resources: NONE

Break: 10 minutes

Lesson Review: (5 Minutes) Summarize the lesson on Slide __19__, review terms and concepts and address student misconceptions.

Independent Work – Posttest (They Do): (30 Minutes)
Have Students review the slides and their notes to prepare for the Posttest.
Explain to the students that they will be assessed and will work independently. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson.

Closing/Wrap Up/Notes Review: (5 minutes)
Tell Students to take a moment to reflect on the lesson of the day. Use as an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?

Summer School Lesson Plan

Subject/Grade: Math/8th Grade **Day: 18**

Topic/Lesson Title & Grade Results #: Application of the Pythagorean Theorem (Lesson18)

- **Objective(s): Students will**
- Define the Pythagorean Theorem and its converse.
- Prove the Pythagorean Theorem and the converse of the Pythagorean Theorem formally and informally.
- Use algebraic reasoning to relate a visual model to the Pythagorean Theorem.
- Explain why the Pythagorean Theorem holds.

Guiding Question(s): How can the Pythagorean Theorem be applied to real world situations?

TN Curriculum Standard(s): 8.G.B.4

Standard Description(s):
Explain a proof of the Pythagorean Theorem and its converse.

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

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

Key Vocabulary/Terms:
Hypotenuse: The longest side opposite to the right angle in a right triangle
Legs: The sides of the right triangle that form the right angle.
Right Angle: An angle that measures 90°.

Take attendance in PowerSchool (5 minutes)

Lesson Introduction (I Do): (15 Minutes)

- **The Teacher will model and present to Students Grade Results Lessons/Activities Application of the Pythagorean Theorem. The students will define the Pythagorean Theorem and its converse, prove the Pythagorean Theorem and the converse of the Pythagorean Theorem formally and informally and use algebraic reasoning to relate a visual model to the Pythagorean Theorem**.

  Slide 1 the student will state the Objectives.
  Slide 2 the teacher will read the Introduction.
  Slide 3 the teacher will review The Pythagorean Theorem
  Slide 4 the teacher will review Converse of the Pythagorean Theorem

Vocabulary: Grade Results Slide 17 The Teacher will review and discuss the Key Vocabulary terms listed above with the student

Activities (We Do): (60 Minutes)
Both Teacher and Student will work together reviewing examples and solving problems in the following activities and lessons in Grade Results

Slide 12 the student will complete the Activity - Determining Right Triangle
Slide 13 the teacher and student will review Applying the Pythagorean Theorem
Slide 14 the student will complete the Activity - Applying the Pythagorean Theorem

Slide 15 the teacher and student will review Forming Right Triangle by Connecting Points on a Grid
Slide 16 the teacher and student will review Derivation of Distance Formula
Slide 17 the teacher and student will review Distance Between Two Points Using the Pythagorean Theorem
Slide 18 the student will complete the Activity - Applying Distance Formula
Slide 19 the teacher and student will review Finding the Coordinate of a Point Using Distance Formula
Slide 20 the teacher and student will review Finding the Points Using Distance Formula
Slide 21 the student will complete the Activity - Use the Pythagorean Theorem to Find the Distance
Slide 22 the student will complete the Drag and Drop Activity

Supplemental: See drop down menu to gain access: Then click on individual pages to access the slides
Page 1: (2:54) Pythagorean Theorem Flocabulary video explains the Pythagorean theorem.
Page 2 (2:54) Determining the Hypotenuse of a Right Triangle-The video demonstrates how to determine the length of the hypotenuse of a right triangle.
Page 3: Solving Problems Using the Distance Formulas – **Worksheet** Teacher will assign each Student a problem to solve to share their answers with the other students.

Additional Teacher Resources: NONE

Break: 10 minutes

Lesson Review: (5 Minutes) Summarize the lesson on Slide __16__, review terms and concepts and address student misconceptions.

Independent Work – Posttest (They Do): (30 Minutes)
Have Students review the slides and their notes to prepare for the Posttest.
Explain to the students that they will be assessed and will work independently. Encourage them to think critically and do their very best on the Posttest. The Posttest will count as the grade for the daily lesson.

Closing/Wrap Up/Notes Review: (5 Minutes)
Take a moment to reflect on the lesson of the day. Use as an exit ticket: Ask students: What did you learn? What surprised you? What is unclear?

Summer School Lesson Plan

Subject/Grade: Math 8th Grade **Day: 19**

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

Objective(s):

- Students will review lessons to prepare for final Post-Test.
- Final Post-test will open. All students must complete the final Post-Test

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

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

Take attendance in PowerSchool (5 minutes)

Lesson Introduction (I Do):
Identify the purpose of the course.
Connect the course to missing or future coursework and Post-test.

Lesson Activities/Supplemental (We Do) – 30-60 minutes

Lesson Activities and Review (We Do):
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):
Students will review and complete any incomplete/missed/failed coursework.

Closing/Wrap Up:

Summer School Lesson Plan

Subject/Grade: Math/8th **Day: 20**

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

Objective(s):

- Students will review lessons to prepare for final Post-Test.
- Final Post-test will open. All students must complete the final post-Test.

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

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

Take attendance in PowerSchool (5 minutes)

Lesson Introduction (I Do):
Identify the purpose of the course.
Connect the course to missing or future coursework and Post-test.

Lesson Activities/Supplemental (We Do) – 30-60 minutes.

Lesson Activities and Review (We Do):
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):
Students will review and complete any incomplete/missed/failed coursework.

Closing/Wrap Up: