



LAWRENCE COUNTY CAREER AND TECHNICAL CENTER

750 Phelps Way, New Castle, PA 16101-5099 724-658-3583 Fax 724-658-4753 www.lcctceagles.com

Table of Contents - Algebra 2

[Linear Inequalities](#)

[Linear Equations and Systems of Equations](#)

[Evaluating Functions and their Domain and Range](#)

[Linear Inequalities](#)

UbD Curriculum Overview

Department	Math		
Course Name	Algebra 2		
Course Summary	In Algebra 2, students will begin evaluating and simplifying algebraic expressions. They will solve linear equations and use algebraic models to solve real-life problems. The course will move on to graphing and using relations and functions. Students will write and graph equations and lines using points, slopes, and intercepts. Students will explore direct variation equations and use scatter plots to identify correlation and find best-fitting lines. Then, the course will focus on solving systems of linear equations in two variables algebraically and graphically. Students will solve and graph linear inequalities and systems of linear inequalities which will then solve and graph absolute value equations and inequalities. The second half of the course will begin with graphing quadratic functions written in standard form, vertex form, and intercept form. Students will learn how to factor and solve quadratic formulas. Then, the course will explore properties of exponents, polynomial functions, adding, subtracting, multiplying, and dividing polynomials.		
Unit Name	Linear Inequalities		
Grade Level(s)	10-11	Time / Duration	4 weeks
Created (Date)	9/26/22	Revised (Date)	3/7/25

Standards Addressed

- A1.1.3.1 Write, solve, and/or graph linear inequalities using various methods.
- A1.1.3.1.1 Write or solve compound inequalities and/or graph their solution sets on a number line (may include absolute value inequalities).



LAWRENCE COUNTY CAREER AND TECHNICAL CENTER

750 Phelps Way, New Castle, PA 16101-5099 724-658-3583 Fax 724-658-4753 www.lcctceagles.com

- CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- CC.2.2.HS.D.7 Create and graph equations or inequalities to describe numbers or relationships.
- CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.
- CC.2.2.HS.D.10 Represent, solve, and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.
- A1.1.3.1.2 Identify or graph the solution set to a linear inequality on a number line.
- A1.1.3.1.3 Interpret solutions to problems in the context of the problem situation. Note: Linear inequalities only.

Stage 1 - Desired Results: Enduring Understandings & Essential Questions

What are the overarching takeaways and big ideas for students?

Big Ideas	1. Use Linear Inequalities
Transfer	<i>Students will be able to independently use their learning to...</i> •
Meaning	<i>Students will understand that...</i> • There are many methods for solving mathematical problems. Systems give absolute or optimal solutions for a set of equations or inequalities. Mathematically correct solutions may not always yield the best solutions.
Essential Questions	1. When do you use inequalities? When do you not? How do you decide which method to use to solve a problem? When is a "correct" mathematical answer not the best solution?

Stage 1 - Essential Content, Concepts, & Skills

What do we want students to know and be able to do?

Acquisition

Knowledge	<i>Students will know...</i> • The student formulates systems of equations and inequalities from problem situations, uses a variety of methods to solve them, and analyzes the solutions in terms of the situations. Following are performance descriptions. (A) The student analyzes situations and formulates systems of equations or inequalities in two or more unknowns to solve problems. (B) The student uses algebraic methods, graphs, tables, or matrices, to solve systems of equations or inequalities. (C) For given contexts, the student interprets and determines the reasonableness of solutions to systems of equations or inequalities.
------------------	--



LAWRENCE COUNTY CAREER AND TECHNICAL CENTER

750 Phelps Way, New Castle, PA 16101-5099 724-658-3583 Fax 724-658-4753 www.lcctceagles.com

Skills

Students will be skilled at (be able to do)...

- The student formulates systems of equations and inequalities from problem situations, uses a variety of methods to solve them, and analyzes the solutions in terms of the situations. Following are performance descriptions. (A) The student analyzes situations and formulates systems of equations or inequalities in two or more unknowns to solve problems. (B) The student uses algebraic methods, graphs, tables, or matrices, to solve systems of equations or inequalities. (C) For given contexts, the student interprets and determines the reasonableness of solutions to systems of equations or inequalities.

Stage 2 - Assessments / Evidence of Learning

What are the formative (informal) and summative (formal) assessments used to measure learning and growth? How will you know that they did it?

Evaluation Criteria (F/S)	Assessment Evidence
•	Performance Task(s) / Think: Performance Task: see attached paper.
•	Other Evidence: Writing samples to accompany one of their examples of solving a linear inequality (explain what they do in each step and why). Quiz over solving linear inequalities. Quiz over solving systems of linear inequalities. Cumulative Test.

Stage 3 - Learning Plan

What are the differentiated instructional strategies, activities, lesson plans that support the enduring understandings and essential questions for all students? This section provides a summary of the Key Learning Events and Instruction.

Summary of Key Learning Events and Instruction

- Day 1-2: • Ask the students the question: what are inequalities (mathematical or otherwise)? • What are some examples of inequalities? Graph one of the examples given to show how real-world ideas and examples can be represented mathematically. Emphasize how you determine which region will be shaded. • Demonstrate “coding” for linear inequalities. “Coding” should have been covered with solving linear equations; explain the extensions of “coding” here. After performing a few examples for the students, have the students work through a set of 10 inequalities where they are to get “y” by itself.
- Day 3: • Explain how to graph inequalities. Again, work a few examples for the students, then walk around the room and check for understanding. Give them examples where they must first “solve” for y, before graphing. • During the last 5 minutes of class, have the students write an explanation of what they are doing and why they are doing it as they solve a linear inequality.



LAWRENCE COUNTY CAREER AND TECHNICAL CENTER

750 Phelps Way, New Castle, PA 16101-5099 724-658-3583 Fax 724-658-4753 www.lcctceagles.com

- Day 4: • Compare and contrast linear equations and linear inequalities. What is the solution of a linear equation/inequality? How many solutions does a linear equation/inequality have? What does the graph of a linear equation/inequality look like? What does a linear equation/inequality look like and what do the different numbers and variables represent? • Have the students find the solutions of a linear inequality algebraically, using a table, and by analyzing its graph.
- Day 5: • Quiz students over solving linear inequalities.
- Days 6-9: • Compare and contrast systems of linear equations to systems of linear inequalities. • What are examples of key words that will help you to identify when you will need to use inequalities to solve a problem? • Go through Unit 1 Lesson 4 Investigations 1-2
- Day 10: • Quiz over systems of linear inequalities.
- Days 11-12: • Go through Unit 1 Lesson 4 Investigation 3.
- Days 13-16: • Allow students to work on their projects. Keep track of their progress using the following checklist: _____
- Day 13: Introduce the performance task. Read through the instructions and go over the rubric. Make sure students give the name of their store and information (description, size, and potential profit) of each product involved. _____
- Days 14-15: Inequalities written down and graphs completed. _____
- Day 16: Reflections completed.
- Days 17-18: • Students will turn in their projects and begin presenting their “stores” to the rest of the class on Day 17.
- Day 19: • Review systems of linear equations with the students. • Have students write an answer to: How do you solve a system of linear inequalities and what does the graphical solution look like?
- Day 20: • Cumulative Test

Resources

- Linear Inequalities Project! Due in Class on _____. You are going to open your own store. However, you need to get a business partner in order to get enough money to get your store running. To show your potential partner your business qualifications, you will show her the process you go through when stocking your products. You are currently trying to decide how much of product A and product B you want to buy. Product A takes up less space than Product B, but it also yields a smaller profit. Note: Assume that there will be no problem selling any amount of either product. You will need to name your store and decide what you want to sell. Product A and Product B will be of your choosing (name and describe each product). You will need to decide on a reasonable amount of space that each product will take up in your store. You will also need to assign an appropriate amount of profit for each product that you sell. Given those amounts of profits for each product and keeping in mind that you have 600ft³ to store those products, how much do you want to make each month in profit from those products? Write two inequalities to represent your constraints and explain what they represent. Graph the inequalities and label all important points and axes. For the final portion of this project, I would like you to reflect on the work you’ve done. Why was the use of a system of linear inequalities necessary for this problem? What do you think about the assumption I asked you to make (at the end of the first paragraph)? What other factors would influence the person’s decision to become your business partner? Pretend you are receiving this proposal; would you want to invest in the store if you were in their place? What other costs will come into play if you were really opening up your own store? What is your favorite thing about your store or presentation? Is there anything you would have liked to have done differently? ****You will give a short (2-3 min) presentation of your project after you turn it in.****



LAWRENCE COUNTY CAREER AND TECHNICAL CENTER

750 Phelps Way, New Castle, PA 16101-5099 724-658-3583 Fax 724-658-4753 www.lcctceagles.com

UbD Curriculum Overview

Department	Mathematics		
Course Name	Algebra 2		
Course Summary	In Algebra 2, students will begin evaluating and simplifying algebraic expressions. They will solve linear equations and use algebraic models to solve real-life problems. The course will move on to graphing and using relations and functions. Students will write and graph equations and lines using points, slopes, and intercepts. Students will explore direct variation equations and use scatter plots to identify correlation and find best-fitting lines. Then, the course will focus on solving systems of linear equations in two variables algebraically and graphically. Students will solve and graph linear inequalities and systems of linear inequalities which will then solve and graph absolute value equations and inequalities. The second half of the course will begin with graphing quadratic functions written in standard form, vertex form, and intercept form. Students will learn how to factor and solve quadratic formulas. Then, the course will explore properties of exponents, polynomial functions, adding, subtracting, multiplying, and dividing polynomials.		
Unit Name	Linear Equations and Systems of Equations		
Grade Level(s)	10-11	Time / Duration	10 days
Created (Date)	2/11/22	Revised (Date)	

Standards Addressed

List all standards that will be addressed during the unit.

Stage 1 - Desired Results: Enduring Understandings & Essential Questions

What are the overarching takeaways and big ideas for students?

Big Ideas	1. Solve systems of equations
Transfer	<i>Students will be able to independently use their learning to...</i> - Demonstrate proficiency of the four ways to solve systems of equations - Create an original system of equations word problem
Meaning	<i>Students will understand that...</i> Logical reasoning is needed to prove an argument.

"The Lawrence County Career and Technical Center is an Equal Opportunity Employer"



LAWRENCE COUNTY CAREER AND TECHNICAL CENTER

750 Phelps Way, New Castle, PA 16101-5099 724-658-3583 Fax 724-658-4753 www.lcctceagles.com

	• Systems of equations are used to solve two or more equations with the same variables. • One method might be better than another for multiple reasons. • Systems of equations can be used to model real world situations.
Essential Questions	1. What makes an argument convincing? 2. Why is one way better than another when solving systems of equations? 3. When do we use systems of equations in the real world? 4. Why are systems of equations important?

Stage 1 - Essential Content, Concepts, & Skills

What do we want students to know and be able to do?

Acquisition

Knowledge	<i>Students will know...</i> • Definitions of systems of equations, linear equations, solutions, and variables • Algebraic techniques of solving linear equations • There are four methods to solve systems of equations. • Systems can have zero, one, or infinite number of solutions. • Persuasive writing techniques • Proper writing conventions
Skills	<i>Students will be skilled at (be able to do)...</i> • Model systems of equations using a word problem • Solve the systems by graphing, elimination, substitution, and matrices • Prove the best method, and analyze solutions for reasonableness • Graph linear equations • Write persuasively

Stage 2 - Assessments / Evidence of Learning

What are the formative (informal) and summative (formal) assessments used to measure learning and growth? How will you know that they did it?

Evaluation Criteria (F/S)	Assessment Evidence
• Create Prove, defend, explain/solve, perform effectively	Performance Task(s) / Think: • Create and solve an original word problem modeling a system of equations • Write a persuasive essay following the STAAR rubric, justifying which method is best to use in the situation
	Other Evidence:



LAWRENCE COUNTY CAREER AND TECHNICAL CENTER

750 Phelps Way, New Castle, PA 16101-5099

724-658-3583

Fax 724-658-4753

www.lcctceagles.com

- Recall Test Test Prove, defend, explain/solve, perform

- Pre-Assessment: Solving Systems
Pre-Assessment Quiz: Solving Systems of Equations and Inequalities by Graphing, Substitution, and Elimination Test: Solving Systems of Equations and Inequalities (using all four methods) Essay: Prove Your Point

Stage 3 - Learning Plan

What are the differentiated instructional strategies, activities, lesson plans that support the enduring understandings and essential questions for all students? This section provides a summary of the Key Learning Events and Instruction.

Summary of Key Learning Events and Instruction

- Day 1 Introduction: Teacher will present a real world example of two text cell phone plans and put up the “polleverywhere.com” hook to tell students to text in their answers when they finish the investigation. Investigation: Students will be paired with the same text messaging plan to do the first page of the investigation. Then after completing, students will pair up with a person who did the other plan and complete the second page. Closure: Students will text in their answer as to what plan they would personally use. Then the students and teacher will have a discussion on why some people chose a certain plan and the algebraic process in which they used to get to the answers. Independent Practice: Students will complete the “Solving Systems Pre-assessment” for homework.
- Day 2-6 Introduction: Teacher will ask students questions to generate knowledge of vocabulary and definitions. Direct Instruction: Most of the lessons on these days will be modeled using direct instruction. Students will perform guided practice and then independent practice to reinforce learning. Some days will not require more instruction, and will simply be practice days to do in class. The teacher will act as a facilitator.
- Day 7-8 Quiz: Systems of Equations and Inequalities After, students will start the Applications of Systems of Equations. This will be an independent practice on Day 7 and a partner practice on Day 8. This will serve as an introduction to word problems that they will later create for their essay. When students complete the applications, they will do a challenge of systems with more than two variables. This will be completed for homework and will be extra credit for how many they complete.
- Day 9-11 Introduction: Teacher will begin day 9 with a real world model. Direct Instruction: Most of the lessons on these days will be modeled using direct instruction. Students will perform guided practice and then independent practice to reinforce learning. Some days will not require more instruction, and will simply be practice days to do in class. The teacher will act as a facilitator. Here, matrices will be practiced and the notes may be long, therefore, timing is flexible. Matrices are the new component of the Algebra II curriculum and thus, these days should require more focused attention to students gaining proficiency and mastery on the material.
- Day 12-15 Introductions: Students will play a “Four Corners” activity in which the teacher will ask 3-5 questions on any topic and students will go to the corner of the room they most believe (strongly agree, agree, disagree, strongly disagree). The teacher will allow time for each group at the corner to discuss why they feel the way they do and then share out their opinions and justifications. This will act as an introduction to persuasive writing to allow students to see that they must back up their claims. Instruction: These days will be dedicated to writing the essay. Students will be required to complete parts of the mathematical process and the essay each day. The teacher will check off the



LAWRENCE COUNTY CAREER AND TECHNICAL CENTER

750 Phelps Way, New Castle, PA 16101-5099 724-658-3583 Fax 724-658-4753 www.lcctceagles.com

accuracy of the math at the beginning of each class. As the culmination, students will upload their final product to Edublog and complete the reflection.

Resources

-



LAWRENCE COUNTY CAREER AND TECHNICAL CENTER

750 Phelps Way, New Castle, PA 16101-5099 724-658-3583 Fax 724-658-4753 www.lcctceagles.com

UbD Curriculum Overview

Department	Mathematics		
Course Name	Algebra 2		
Course Summary	In Algebra 2, students will begin evaluating and simplifying algebraic expressions. They will solve linear equations and use algebraic models to solve real-life problems. The course will move on to graphing and using relations and functions. Students will write and graph equations and lines using points, slopes, and intercepts. Students will explore direct variation equations and use scatter plots to identify correlation and find best-fitting lines. Then, the course will focus on solving systems of linear equations in two variables algebraically and graphically. Students will solve and graph linear inequalities and systems of linear inequalities which will then solve and graph absolute value equations and inequalities. The second half of the course will begin with graphing quadratic functions written in standard form, vertex form, and intercept form. Students will learn how to factor and solve quadratic formulas. Then, the course will explore properties of exponents, polynomial functions, adding, subtracting, multiplying, and dividing polynomials.		
Unit Name	Evaluating Functions and their Domain and Range		
Grade Level(s)	10-11	Time / Duration	60 min
Created (Date)	3/11	Revised (Date)	

Standards Addressed

List all standards that will be addressed during the unit.

- A1.2.1.1
- A1.2.1.1.3 Identify the domain or range of a relation (may be presented as ordered pairs, a graph, or a table).

Stage 1 - Desired Results: Enduring Understandings & Essential Questions

What are the overarching takeaways and big ideas for students?

Big Ideas	1. Evaluate Functions and their Domain and Range
Transfer	<i>Students will be able to independently use their learning to...</i> • Students will be able to independently use their learning to... Create a function machine that illustrates a situation and after determining and expressing the domain and range numerically and verbally. Students will analyze the function, evaluating at important values, and



LAWRENCE COUNTY CAREER AND TECHNICAL CENTER

750 Phelps Way, New Castle, PA 16101-5099 724-658-3583 Fax 724-658-4753 www.lcctceagles.com

	expressing in various representations.
Meaning	<i>Students will understand that...</i> Functions can be represented in a variety of ways. Different representations can give different information at a glance, serving a different purpose. Being able to interpret various representations and analyze the relationships can assist in understanding the independent or dependent values within the relationship and whether there is cause and effect. Numbers have meaning. It is important to attach the meaning to values given in the equation and the resulting ordered pairs. Many real world functional relationships can be represented by equations. Equations can be used to find the solution of given realworld problems.
Essential Questions	Why is it helpful to have several different representations of the same function? Why is it considered functional to have outputs with different inputs but not vice-versa? How can functions describe realworld situations, model predictions and solve problems? How does identifying the restriction on the domain and range of a function further our understanding of the function? Why does it matter to be able to link inputs with outputs? What real world purposes could this serve?

Stage 1 - Essential Content, Concepts, & Skills

What do we want students to know and be able to do?

Acquisition

Knowledge	<i>Students will know...</i> Definition of a function (for every input, there is exactly one output) Other Vocabulary: Domain, Range, Discrete, Continuous Domain and range are the inputs and outputs, the x and y, the independent and dependent variables of an equation. All functions are relations, not all relations are functions Real world data can often be modeled with a function. Functions can be written in various forms, including graphs, tables and equations, and representations can be translated from one to another. Functions are a mathematical way to describe relationships between two quantities that vary.
Skills	<i>Students will be skilled at (be able to do)...</i> - Identifying functions using various methods. - Vertical Line Test (Graph) - X cannot repeat with different Ys (Table, Mapping) - Evaluating functions given the input. - Stating domain and range of a relation using inequalities or lists. - Attributing meaning to values in an equation given a situation. - Identifying Independent and Dependent Variables - Represent and describe functions



LAWRENCE COUNTY CAREER AND TECHNICAL CENTER

750 Phelps Way, New Castle, PA 16101-5099 724-658-3583 Fax 724-658-4753 www.lcctceagles.com

Stage 2 - Assessments / Evidence of Learning

What are the formative (informal) and summative (formal) assessments used to measure learning and growth? How will you know that they did it?

Evaluation Criteria (F/S)	Assessment Evidence
Create a function. Explain key features of their function. Evaluate function values. Determine what would break the function	Performance Task(s) / Think: Students will create a function machine for a real-world example of a function. From that situation, the students will determine whether the situation is continuous or discrete, explaining how they know. The students will determine a reasonable domain and range and express appropriately according to the situation, either as a list or inequalities. They will then use the domain and range to express the relation of the situation in two or more representations, and evaluate the function at the extrema. The students will need to describe WHY the situation is a function and give an anecdote that would then eliminate this possibility.
	Other Evidence: Pretest Exit Tickets Pop Quiz Warm-Ups Homework Quiz Test

Stage 3 - Learning Plan

What are the differentiated instructional strategies, activities, lesson plans that support the enduring understandings and essential questions for all students? This section provides a summary of the Key Learning Events and Instruction.

Summary of Key Learning Events and Instruction

- Day 1 – Function or Not Warm – Up – Discuss with your partner or tablemates, How does a vending machine work? What makes a vending machine “functional” and when would a vending machine be dysfunctional? Discussion – Vending machines work because if you press B2, you hopefully know what you’re going to get. Say B2 is a Snickers bar, and C4 is a Butterfingers – each input has exactly one output. If Snickers are popular, you can press either B2 OR B3, so the same output can have multiple inputs. If you press B2, it shouldn’t drop more than just a Snickers. The candy that drops depends on the buttons you input. EQ Focus – Why is considered functional to have outputs with different inputs but not vice-versa? New Vocabulary – Function, Relation, Mapping, Ordered Pairs, Graph, Independent and Dependent Variable, Vertical Line Test Lesson – Using the example of the vending machine, the students will go through mathematical examples and non-examples and determine if they are functions. Then they will decide on the rule or notes to write to help them remember. Then they will create one example of a function within the four representations (Ordered



LAWRENCE COUNTY CAREER AND TECHNICAL CENTER

750 Phelps Way, New Castle, PA 16101-5099 724-658-3583 Fax 724-658-4753 www.lcctceagles.com

Pairs, Table, Map, and Graph), Activity – Discuss with your group and think of two other examples of functions in the real world, like a vending machine. Share out. Independent Practice – Homework, practice identifying functions from various representations. How would you describe a function to a younger middle school student? How would you describe a function to your parent?

- Day 2 – Evaluate Functions Warm – Up – Simplify Expressions using the order of operations. Discussion – Evaluating Functions is like simplifying expressions, but you are linking an input with an output, or an x- value with a y-value. The important thing to realize, is you are substituting a value in where x is. Fun “Nuggetizer” video of a function machine:
<https://www.youtube.com/watch?v=VUTXsPFx-qQ> EQ Focus – Why does it matter to be able to link inputs with outputs? What real world purposes could this serve? New Vocabulary – Domain, Range, Evaluate, Function Notation, Independent and Dependent Variable Lesson – To evaluate functions, you plug your input value in for x (or your domain element) to find your output value for y (or the corresponding element of the range). Function Notation is a way to identify relationships within an equation. Activity – Evaluate Function Practice Owl. Review problems where the input is an expression. Independent Practice –
- Day 3 – Evaluate Functions Many Ways Warm – Up – Evaluating Functions - If evaluating functions is pairing an input to its corresponding outputs, you can do so with an equation, table of values, or graph. Discussion – Where do we see our new vocabulary used in our warm-up? When it tells me to find the range, given the domain, what does that mean? EQ Focus – How can functions describe real-world situations, model predictions and solve problems? New Vocabulary – Domain, Range, Evaluate, Function Notation, Independent and Dependent Variable Lesson – Sometimes you are expected to find the input when given the output. How do you do this in a graph or equation? Activity – Evaluating Functions in Many Ways (Odds) in partners or tables. Independent Practice
- Day 4 – Domain and Range Warm – Up – Go over Pre-Reading links, or have students do in pairs at beginning of class. Also, available notes in McGraw-Hill Algebra 1 Textbook page 40 and 48. Discussion – What representations work best for discrete functions? Which work best for continuous? Are there some representations that work for both? EQ Focus – How does identifying the restriction on the domain and range of a function further our understanding of the function? New Vocabulary – Domain, Range, Discrete, Continuous Lesson – Depending on whether it is discrete or continuous determines what method we use to express the domain and range. Activity – Students read the inequality statements or lists with a partner and write in words what it means. Then they find and write the corresponding graph that matches that domain and range. Independent Practice
- Day 5 – Domain and Range in Context Warm – Up – Review words that mean Domain (x-value, independent variable, input) and Range (y-value, dependent variable, output) Discussion – What are your take-aways from the YouTube video? EQ Focus – How does identifying the restriction on the domain and range of a function further our understanding of the function? Lesson – Review the real number system from prior TEKS. Can you say all real numbers if we’re talking about number of tickets being sold at the dance? Would you include less than zero if the range is about your grade on a test? Activity – Domain and Range Situation to Graph Match from Supporting STAAR Achievement: Algebra I from Region 4 (Not included in UbD) Independent Practice
- Day 6 – Domain and Range in Context Warm – Up – When is a situation a function and when is it not? Discussion – How can we determine the domain and range without a visual aid? EQ Focus – How does identifying the restriction on the domain and range of a function further our understanding of the function? Activity – Students practice finding domain and range given situations. This will be a stretch for some as they may have to think of the relationship with an equation or make a table to describe what is happening. Independent Practice



LAWRENCE COUNTY CAREER AND TECHNICAL CENTER

750 Phelps Way, New Castle, PA 16101-5099 724-658-3583 Fax 724-658-4753 www.lcctceagles.com

- Day 7 – Quiz/Intro to Performance Task EQ Focus – How can functions describe real-world situations, model predictions and solve problems? Independent Practice – Think of a real world function that you can use for your performance task tomorrow.
- Day 8 – Performance Task/Review Warm – Up – Go over quiz. Focus on common misconceptions. Discussion – Use a situation or two from “Be Reasonable” to explain purpose and procedure of Performance Task. EQ Focus – How can functions describe real-world situations, model predictions and solve problems? Activity – Performance Task
-

Resources

-



LAWRENCE COUNTY CAREER AND TECHNICAL CENTER

750 Phelps Way, New Castle, PA 16101-5099 724-658-3583 Fax 724-658-4753 www.lcctceagles.com

UbD Curriculum Overview

Department	Mathematics		
Course Name	Algebra 2		
Course Summary	The students will be introduced to linear inequalities and systems of linear inequalities. The main understandings that I want to develop in my students are that there are many methods to solving math problems and that solving the problem is not always enough (mathematically correct solutions are not always the best solutions). They will need to analyze the solutions they develop to determine whether or not their answer is reasonable. Students will demonstrate their knowledge of linear equalities by solving them algebraically, graphically, and using a table. Students will compare and contrast linear equations to linear inequalities. They will explore real-world examples of linear inequalities and discuss when linear inequalities are necessary to solve certain problems. Students will apply what they have learned to a project. Each student will open a store of their choosing. They must decide how many of two products they would like to have at their store based upon the amount of space each takes up and the profit earned by each product. They will also compare this simplified problem to what the problem would be like in the real world.		
Unit Name	Linear Inequalities		
Grade Level(s)	10-11	Time / Duration	4 weeks
Created (Date)	6/1/22	Revised (Date)	

Standards Addressed

List all standards that will be addressed during the unit.

Stage 1 - Desired Results: Enduring Understandings & Essential Questions

What are the overarching takeaways and big ideas for students?

Big Ideas	1. To solve, graph, and interpret linear inequalities
Transfer	<i>Students will be able to independently use their learning to...</i> Solve and graph linear inequalities and interpret word problems using inequalities.
Meaning	<i>Students will understand that...</i> There are many methods for solving mathematical problems. Systems



LAWRENCE COUNTY CAREER AND TECHNICAL CENTER

750 Phelps Way, New Castle, PA 16101-5099 724-658-3583 Fax 724-658-4753 www.lcctceagles.com

	give absolute or optimal solutions for a set of equations or inequalities. Mathematically correct solutions may not always yield the best solutions.
Essential Questions	1. When do you use inequalities? When do you not? How do you decide which method to use to solve a problem? When is a “correct” mathematical answer not the best solution?

Stage 1 - Essential Content, Concepts, & Skills

What do we want students to know and be able to do?

Acquisition

Knowledge	<i>Students will know...</i> The student formulates systems of equations and inequalities from problem situations, uses a variety of methods to solve them, and analyzes the solutions in terms of the situations. Following are performance descriptions. (A) The student analyzes situations and formulates systems of equations or inequalities in two or more unknowns to solve problems.
Skills	<i>Students will be skilled at (be able to do)...</i> (B) The student uses algebraic methods, graphs, tables, or matrices, to solve systems of equations or inequalities. (C) For given contexts, the student interprets and determines the reasonableness of solutions to systems of equations or inequalities.

Stage 2 - Assessments / Evidence of Learning

What are the formative (informal) and summative (formal) assessments used to measure learning and growth? How will you know that they did it?

Evaluation Criteria (F/S)	Assessment Evidence
You are going to open your own store. However, you need to get a business partner in order to get enough money to get your store running. To show your potential partner your business qualifications, you will show her the process you go through when stocking your products. You are currently trying to decide how much of product A and product B you want to buy. Product A takes up less space than Product B, but it also yields a smaller profit. Note: Assume that there will be no problem selling any amount of either product. You will need to name your store and decide what you want to sell. Product A and Product B will be of your choosing (name and describe each	Performance Task(s) / Think:



LAWRENCE COUNTY CAREER AND TECHNICAL CENTER

750 Phelps Way, New Castle, PA 16101-5099 724-658-3583 Fax 724-658-4753 www.lcctceagles.com

product). You will need to decide on a reasonable amount of space that each product will take up in your store. You will also need to assign an appropriate amount of profit for each product that you sell. Given those amounts of profits for each product and keeping in mind that you have 600ft³ to store those products, how much do you want to make each month in profit from those products? Write two inequalities to represent your constraints and explain what they represent. Graph the inequalities and label all important points and axes. For the final portion of this project, I would like you to reflect on the work you've done. Why was the use of a system of linear inequalities necessary for this problem? What do you think about the assumption I asked you to make (at the end of the first paragraph)? What other factors would influence the person's decision to become your business partner? Pretend you are receiving this proposal; would you want to invest in the store if you were in their place? What other costs will come into play if you were really opening up your own store? What is your favorite thing about your store or presentation? Is there anything you would have liked to have done differently? ****You will give a short (2-3 min) presentation of your project after you turn it in

- file:///C:/Users/NoOne/Downloads/DOC060122-06012022130501.pdf

Other Evidence:

-

Stage 3 - Learning Plan

What are the differentiated instructional strategies, activities, lesson plans that support the enduring understandings and essential questions for all students? This section provides a summary of the Key Learning Events and Instruction.

Summary of Key Learning Events and Instruction

- Day 1-2: •Ask the students the question: what are inequalities (mathematical or otherwise)? •What are some examples of inequalities? Graph one of the examples given to show how real-world ideas and examples can be represented mathematically. Emphasize how you determine which region will be shaded. •Demonstrate "coding" for linear inequalities. "Coding" should have been covered with solving linear equations; explain the extensions of "coding" here. After performing a few examples for the students, have the students work through a set of 10 inequalities where they are to get "y" by itself.



LAWRENCE COUNTY CAREER AND TECHNICAL CENTER

750 Phelps Way, New Castle, PA 16101-5099 724-658-3583 Fax 724-658-4753 www.lcctceagles.com

- Day 3: Explain how to graph inequalities. Again, work a few examples for the students, then walk around the room and check for understanding. Give them examples where they must first “solve” for y , before graphing. •During the last 5 minutes of class, have the students write an explanation of what they are doing and why they are doing it as they solve a linear inequality.
- Day 4: •Compare and contrast linear equation and linear inequalities. What is the solution of a linear equation/inequality? How many solutions does a linear equation/inequality have? What does the graph of a linear equation/inequality look like? What does a linear equation/inequality look like and what do the different numbers and variables represent? •Have the students find the solutions of a linear inequality algebraically, using a table, and by analyzing its graph.
- Day 5: •Quiz students over solving linear inequalities.
- Days 6-9: •Compare and contrast systems of linear equations to systems of linear inequalities. •What are examples of key words that will help you to identify when you will need to use inequalities to solve a problem? •Go through Unit 1 Lesson 4 Investigations 1-2
- Day 10: •Quiz over systems of linear inequalities.
- Days 11-12: •Go through Unit 1 Lesson 4 Investigation 3.
- Days 13-16: •Allow students to work on their projects. Keep track of their progress using the following checklist: _____
- Day 13: Introduce the performance task. Read through the instructions and go over the rubric. Make sure students give the name of their store and information (description, size, and potential profit) of each product involved. _____
- Days 14-15: Inequalities written down and graphs completed. _____
- Day 16: Reflections completed.
- Days 17-18: •Students will turn in their projects and begin presenting their “stores” to the rest of the class on Day 17.
- Day 19: •Review systems of linear equations with the students. •Have students write an answer to: How do you solve a system of linear inequalities and what does the graphical solution look like?
- Day 20: •Cumulative Test

Resources

-