Southern Lehigh School District

UbD Curriculum Template

Course: Algebra IB | Unit: 1 - Equations | Grades: **8,9**

Teacher Team: Viola, Bronfenbrenner | Date: October, 2016

Stage 1 – Desired Results	
Established Goals	**Enduring Understandings/Transfer**
1. What 21st Century Essentials included in the mission statement will this unit address? *Transfer of Learning* *Career Planning and Life-Long Learning* *Problem Solving* 2. What content standards will this unit address? ● ELA PA Core State Standards ● Math PA Core State Standards CC.2.1.7.E.1 Apply and extend previous understandings of operations with fractions to operations with rational numbers. CC.2.2.7.B.1 Apply properties of operations to generate equivalent expressions. CC.2.1.HS.F.2 Apply properties of rational and irrational number to solve real world or mathematical problems.	**Written as a declarative statement, an enduring understanding is a "big idea" that focuses on larger concepts, principles, and processes that go beyond discrete facts or skills. Enduring Understandings are applicable to new situations across content areas and TRANSFERABLE (the ability to learn in one context and apply to a new situation, particularly outside of the classroom) to the real world.** 3. List the Enduring Understanding(s): *a. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions.* *b. Real number properties apply to numbers and variables in all situations.* *c. Mathematical relationships can be represented as expressions, equations, and inequalities in mathematical situations.* *d. Communicate mathematical concepts to peers, teachers, and instructional assistants in a safe and encouraging environment.* 4. What do you want students to do with this knowledge or skill beyond this course? What is Transfer? *a. Students will make sense of and persevere in solving complex and novel mathematical problems.* *b. Students will use effective mathematical reasoning to construct viable arguments and critique the reasoning of others.* *c. Students will communicate precisely when making mathematical statements and express answers with a degree of precision appropriate for the context of the problem/situation.* *d. Students will apply mathematical knowledge to analyze and model situations/relationships using multiple representations and appropriate tools in order to make decisions, solve problems, and draw conclusions.* *e. Students will make use of structure and repeated reasoning to gain a mathematical perspective and formulate generalized problem solving strategies* *f. Given a word problem, students will solve the word problem using an appropriate strategy or strategies and will share and compare the use of multiple strategies leading to the same answer.* *g. Obtaining a solution to an equation no matter how complex, always involves the process of undoing operations.* *h. Real World situations can be modeled and solved by using equations.*

CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.
CC.2.2.HS.D.1 Interpret the structure of expressions to represent a quantity in terms of its context.
CC.2.2.HS.D.2 Write expressions in equivalent forms to solve problems CC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable.
CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.

What thought-provoking questions will foster inquiry, meaning-making, and transfer?

5. List the Essential Question(s) that students should ponder, wonder about or explain by the end of this unit:
a. How are properties of real numbers used to simplify expressions?
b. How can you represent quantities, patterns, and relationships?
c. How can expressions, and equations be used to quantify, solve, model, and/or analyze mathematical situations?
d .How can equations that appear to be different be equivalent?
e. How can you solve equations?

Acquisition

Students will know...	**Students will be skilled at... (be able to do)**
6. What facts should students know and be able to use to gain further knowledge? *Integer operations* 7. What vocabulary should students know and be able to recall? *Tier 2:* *apply, distinguish, estimate, compare, contrast, develop, understand, analyze, define, determine, identify, perform, interpret, compare, construct, describe, extend, represent, extend, explain, represent, create, relationships, display, simplify, inferences, predict, model* *Tier 3:* *additive inverse, algebraic expression, coefficient, evaluate equations, integers, combine like terms, order of operations, real numbers, simplify, term, variable, compare, distribute, inverse operations, rate, scale, equal sign, left side, right side, identify variable, plan algebraic moves, arrive at a solution with a variable by self, expressions, check process,*	9. What discrete skill and processes should students be able to demonstrate? *A1.1.1.1.1 Compare and/or order any real numbers. Note: Rational and irrational may be mixed. properties/laws of exponents, roots, and/or absolute values to solve problems. Note: Exponents should be integers from –10 to 10* *A1.1.2.1.1 Write, solve, and/or apply a linear equation (including problem situations).* *A1.1.2.1.2 Use and/or identify an algebraic property to justify any step in an equation□solving process. Note: Linear equations only.* *A1.1.3.1.3 Interpret solutions to problems in the context of the problem situation. Note: Linear inequalities only.*

● PA Content Standards	*with a variable by itself, expressions, check process, express variable by itself.* 8. What basic concepts should students know and be able to recall and apply? *Recognize like terms, combine like terms, distribute, evaluate and write variable expressions and equations, if there are variables on both sides, you must move one of the variables to the other side.*	

Stage 2 – Evidence	
NETS for Students	**PERFORMANCE TASK(S)—can include transfer tasks and Project-Based Learning**
NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world. *Critical Thinking* *Technology Operations*	*Examples include but are not limited to:* *Labs, open-ended essays, voice recordings, videos, presentations, discussion boards, graphic organizers, songs, skits, dioramas, visual projects (posters, dioramas)* List the task(s), then explain how the student will demonstrate the transfer of knowledge or skill involved in the task(s) (reference Stage 1, Item #4): *Generate equations and representations that can be used to solve world problems and check for reasonableness of solutions.* *Write and solve equations from word problems and then test for reasonableness of answers, including rounding up or down, as appropriate.*
	OTHER SUMMATIVE ASSESSMENTS—can include factual recall
	Examples include but are not limited to final projects, research papers, quizzes and tests. List the assessments: *Quizzes and Tests*

Stage 3 – Learning Plan		
NETS for Students	**Learning Activities**	**Progress Monitoring/Formative Assessment**
NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills	Questions to consider while planning: ● Are transfer and acquisition addressed in the learning plan?	● **How will you monitor students' progress toward acquisition, meaning, and transfer during learning activities?**

<table>
<tr>
<td rowspan="2">and knowledge students need to learn effectively and live productively in an increasingly global and digital world.

Critical Thinking
Technology Operations</td>
<td colspan="2">Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?</td>
<td>Daily assessments, teacher observation of students in□ class performance, teacher observation during peer share□out sessions, notebook assessment, SLO
What are potential rough spots and student misunderstandings? Distributing □□ remember to
distribute to everything in the parentheses and remembering to distribute the negative signs
Adding like terms □□ keeping the signs with the correct term Calculation errors at the beginning of a problem will give an incorrect answer
Students don't choose the easiest way to solve the problem which created more difficult arithmetic
Students forget that they must variables to the same side of the equation
Students forget that they must do the same thing to both sides of the equation, which should be the inverse operation of the original equation
Students do not check answers using calculators
How will students get the feedback they need? Graded assessment, teacher observation immediate feedback, peer feedback, mid□chapter quiz, Xtramath, notebook assessment</td>
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<tr>
<td>List planned activities
(examples include but are not limited to: experiments, guided reading, worksheets, discussions, note-taking, research, games):

Translating expression matching activity - given an expression and word phrases, students will match them appropriately

Word Problems Google Slides presentation - have students present word</td>
<td>List resources required
(examples include but are not limited to: laptops, iPads, websites, digital cameras, magazines, Blackboard, textbooks, novels, primary source documents, other non-fiction text, lab equipment, maps, translator, calculators)

Textbook, laptops, whiteboard, graph paper white boards, document camera, calculators</td>
<td>FORMATIVE ASSESSMENTS—any non-graded, diagnostic assessment administered prior to or during a unit that reflects prior knowledge, skill levels, and potential misconceptions.

Examples include but are not limited to: Pre-tests, clickers (CPS), mini whiteboards, entrance and exit tickets, CDTs, DIBELS, Aimsweb

Study island, mini whiteboards, Kahoot, Google Classroom, Spartan Docs, Xtramath, Quizlet</td>
</tr>
</table>

	problems using google slides to the entire class. worksheets, classwork, homework, Study Island		

Southern Lehigh School District

UbD Curriculum Template

Course: Algebra IB **Unit: 2 - Inequalities** **Grades: 8, 9**

Teacher Team: Viola, Bronfenbrenner **Date: October, 2016**

Stage 1 – Desired Results	
Established Goals	**Enduring Understandings/Transfer**
1. What 21st Century Essentials included in the mission statement will this unit address? *Transfer of Learning* *Career Planning and Life-Long Learning* *Problem-solving* 2. What content standards will this unit address? ● ELA PA Core State Standards ● Math PA Core State Standards CC.2.2.7.B.3 Model and solve real world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations. CC.2.2.HS.D.1 Interpret the structure of expressions to represent a quantity in terms of its context. CC.2.2.HS.D.7 Create and graph equations or inequalities to describe numbers or relationships.	**Written as a declarative statement, an enduring understanding is a "big idea" that focuses on larger concepts, principles, and processes that go beyond discrete facts or skills. Enduring Understandings are applicable to new situations across content areas and TRANSFERABLE (the ability to learn in one context and apply to a new situation, particularly outside of the classroom) to the real world.** 3. List the Enduring Understanding(s): *a. Real World situations can be modeled and solved by using equations and inequalities.* *b. Equations may have one solution, no solution, or infinitely many solutions/all real numbers* *c. inequalities have a set of solutions, which are sometimes graphed on a number line. Inequalities can also have no solution.* *d. Compound inequalities can be solved by graphing each simple inequality that is represented.* *e. Communicate mathematical concepts to peers, teachers, and instructional assistants in a safe and encouraging environment.* 4. What do you want students to do with this knowledge or skill beyond this course? What is Transfer? *a. Students will make sense of and persevere in solving complex and novel mathematical problems.* *b. Students will use effective mathematical reasoning to construct viable arguments and critique the reasoning of others.* *c. Students will communicate precisely when making mathematical statements and express answers with a degree of precision appropriate for the context of the problem/situation.* *d. Students will apply mathematical knowledge to analyze and model situations/relationships using multiple representations and appropriate tools in order to make decisions, solve problems, and draw conclusions.* *e. Students will make use of structure and repeated reasoning to gain a mathematical perspective and formulate generalized problem solving strategies* *f. Given a word problem, students will solve the word problem using an appropriate strategy or strategies and will share and compare the use of multiple strategies leading to the same answer.* *g. Students will recognize what an equation/inequality with no solution means in real life; they also will recognize what an equation/inequality with an infinite number of solutions means.*

CC.2.2.HS.D.10 Represent, solve, and Interpret equations/inequalities and systems of equations algebraically and graphically.

- PA Content Standards

Essential Questions

What thought-provoking questions will foster inquiry, meaning-making, and transfer?

5. List the Essential Question(s) that students should ponder, wonder about or explain by the end of this unit:
   a. *How can equations or inequalities that appear to be different be equivalent?*
   b. *How can you solve equations and inequalities?*
   c. *How can expressions, equations, and inequalities be used to quantify, solve, model, and/or analyze mathematical situations?*

Students will know...	**Students will be skilled at... (be able to do)**
6. What facts should students know and be able to use to gain further knowledge? *When you divide or multiply by a negative number, the inequality sign switches directions* 7. What vocabulary should students know and be able to recall? *Tier 2:* *apply, distinguish, estimate, compare, contrast, develop, understand, analyze, define, determine, identify, perform, derive, interpret, compare, construct, describe, extend, represent, extend, explain, represent, create, relationships, display, simplify, inferences, predict, model* *Tier 3:* *distribute, combine like terms, simplify, variable, equivalent equations, formula, inverse operations, rate, ratio, scale, unit analysis, compound inequality, equivalent inequalities, all real numbers/infinite solution, no solution set, expression, left side, right side, identify variable, plan algebraic moves, arrive at a solution with the variable by itself, inequality signs, expressions, left side, right side, less than, greater than, less than or*	9. What discrete skill and processes should students be able to demonstrate? *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).* *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.*

equal to, greater than or equal to, at least, minimum, no more than, maximum, at most, check process, express variable by itself 8. What basic concepts should students know and be able to recall and apply? *How to draw and label a number line.* *When graphing inequalities with less than or equal to OR greater than or equal to you must fill in the circle; otherwise the circle is left open.* *When graphing compound inequalities be able identify graphs that have infinite solutions and all real number solutions.*	

Stage 2 – Evidence	
NETS for Students	**PERFORMANCE TASK(S)—can include transfer tasks and Project-Based Learning**
NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world. *Critical Thinking* *Technology Operations*	*Examples include but are not limited to:* *Labs, open-ended essays, voice recordings, videos, presentations, discussion boards, graphic organizers, songs, skits, dioramas, visual projects (posters, dioramas)* List the task(s), then explain how the student will demonstrate the transfer of knowledge or skill involved in the task(s) (reference Stage 1, Item #4): *Students sort equations into 3 categories - one solution, no solution, or infinitely many solutions/all real numbers. They show work and then critique others work* *Students will write and solve equations from word problems and then test for reasonableness of answers, including rounding up or down, as appropriate.*
	OTHER SUMMATIVE ASSESSMENTS—can include factual recall
	Examples include but are not limited to final projects, research papers, quizzes and tests. List the assessments: *Quizzes and Tests*

	Learning Activities		Progress Monitoring/Formative Assessment
Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world. *Critical Thinking* *Technology Operations*	Questions to consider while planning: ● Are transfer and acquisition addressed in the learning plan? ● Does the learning plan reflect principles of learning and best practices? ● Is there tight alignment with Stages 1 and 2? ● Is the plan likely to be engaging and effective for all students?		● **How will you monitor students' progress toward acquisition, meaning, and transfer during learning activities?** *Daily assessments, teacher observations of students in-class performance, teacher observation during peer share-out sessions, notebook assessment* ● **What are potential rough spots and student misunderstandings?** *Distributing □□ remember to distribute to everything in the parentheses and remembering to distribute the negative signs* *When multiplying or dividing by a negative number, the inequality sign switches* *Adding like terms □□ keeping the signs with each term Calculation errors at the beginning of a problem will give an incorrect answer* *Students don't choose the easiest way to solve the problem which created more difficult arithmetic* *Students forget that they must variables to the same side of the equation* *Students forget that they must do the same thing to both sides of the equation, which should be the inverse operation of the original equation* *Students don't check answers using calculators* ● **How will students get the feedback they need?** *Graded assessment, teacher observation, immediate feedback, peer feedback, mid-chapter quiz, X-tra Math, notebook assessment*
	List planned activities *(examples include but are not limited to: experiments, guided reading, worksheets, discussions, note-taking, research, games)*: *Vocabulary t-chart activity. Students brainstorm key*	**List resources required** *(examples include but are not limited to: laptops, iPads, websites, digital cameras, magazines, Blackboard, textbooks, novels, primary source documents, other non-fiction*	**FORMATIVE ASSESSMENTS—any non-graded, diagnostic assessment administered prior to or during a unit that reflects prior knowledge, skill levels, and potential misconceptions.** *Examples include but are not limited to: Pre-tests, clickers (CPS), mini whiteboards, entrance and exit tickets, CDTs, DIBELS, Aimsweb*

	words that represent inequality symbols. As a class we create a list to be used when solving or writing word problems. worksheets, classwork, homework, Study Island	*text, lab equipment, maps, translator, calculators)* Textbook, laptops, whiteboard, graph paper white boards, document camera, calculators	*Study Island, mini whiteboards, Kahoot, X-tra Math*

Southern Lehigh School District

UbD Curriculum Template

Course: Algebra IB | **Unit: 3 Absolute Value/Proportions and Percents** | **Grades: 8, 9**

Teacher Team: Viola, Bronfenbrenner | **Date: October, 2016**

Stage 1 – Desired Results	
Established Goals	**Enduring Understandings/Transfer**
1. What 21st Century Essentials included in the mission statement will this unit address? *Transfer of Learning* *Career Planning and Life-Long Learning* *Problem Solving* 2. What content standards will this unit address? Please access the appropriate standards and copy/paste in the gray region ● ELA PA Core State Standards ● Math PA Core State Standards CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real□world and mathematical problems. CC.2.2.7.B.1 Apply properties of operations to generate equivalent expressions.	**Written as a declarative statement, an enduring understanding is a "big idea" that focuses on larger concepts, principles, and processes that go beyond discrete facts or skills. Enduring Understandings are applicable to new situations across content areas and TRANSFERABLE (the ability to learn in one context and apply to a new situation, particularly outside of the classroom) to the real world.** 3. List the Enduring Understanding(s): *a. Recognize an absolute value function given an equation or graph and be able to graph an absolute value function* *b. Compound inequalities and absolute value inequalities can be solved by graphing each simple inequality that is represented.* *c. Communicate mathematical concepts to peers, teachers, and instructional assistants in a safe and encouraging environment.* 4. What do you want students to do with this knowledge or skill beyond this course? What is Transfer? *a. Students will make sense of and persevere in solving complex and novel mathematical problems.* *b. Students will use effective mathematical reasoning to construct viable arguments and critique the reasoning of others.* *c. Students will communicate precisely when making mathematical statements and express answers with a degree of precision appropriate for the context of the problem/situation.* *d. Students will apply mathematical knowledge to analyze and model situations/relationships using multiple representations and appropriate tools in order to make decisions, solve problems, and draw conclusions.* *e. Students will make use of structure and repeated reasoning to gain a mathematical perspective and formulate generalized problem solving strategies* *f. Given a word problem, students will solve the word problem using an appropriate strategy or strategies and will share and compare the use of multiple strategies leading to the same answer.* *g. Obtaining a solution to an equation no matter how complex, always involves the process of undoing operations.* *h. Real World situations can be modeled and solved by using equations.*

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real□world or mathematical problems.

CC.2.2.8.B.2 Understand the connections between proportional relationships, lines, and linear equations.

- PA Content Standards

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real-world or mathematical problems.

CC.2.2.8.B.2 Understand the connections between proportional relationships, lines, and linear equations.

- PA Content Standards

Essential Questions

What thought-provoking questions will foster inquiry, meaning-making, and transfer?

5. List the Essential Question(s) that students should ponder, wonder about or explain by the end of this unit:
   a .How can an absolute value equation be the same as a compound inequality?
   b. How can you solve absolute value equations?
   c. What kind of relationships can proportions represent?
   d. How do you use percents to solve problems?

Students will know...

6. What facts should students know and be able to use to gain further knowledge?
   When you multiply or divide by a negative number, the inequality sign switches directions.
   Absolute value measures the distance to 0 on a number line and is always a positive value.

7. What vocabulary should students know and be able to recall?

   Tier 2:
   apply, distinguish, estimate, compare, contrast, develop, understand, analyze, define, determine, identify, perform, derive, interpret, compare, construct, describe, extend, represent, extend, explain, represent, create, relationships, display, simplify, inferences, predict, model
   Tier 3:
   compound inequality, absolute value, greater than, less than, greater than or equal to, less than or equal to, and vs or, proportion, percent, percent change, cross multiply, cross product, additive inverse, algebraic expression, coefficient, evaluate equations, integers, combine like terms, order of operations, real numbers, simplify, term, variable, compare, distribute, inverse operations, rate, scale, equal sign, left side, right side, identify variable,

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

9. What discrete skill and processes should students be able to demonstrate?
   A1.1.1.3.1 Simplify/evaluate expressions involving properties/laws of exponents, roots, and/or absolute values to solve problems. Note: Exponents should be integers from –10 to 10
   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).

plan algebraic moves, arrive at a solution with variable by itself, expressions, check process, express variable by itself, graph, number line, open circle, closed circle, all real numbers, no solution 8. What basic concepts should students know and be able to recall and apply? *An absolute value inequality should be split into a compound inequality correctly and then solved and graphed accordingly.*	

Stage 2 – Evidence	
NETS for Students	**PERFORMANCE TASK(S)—can include transfer tasks and Project-Based Learning**
NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world. *Critical Thinking* *Technology Operations*	*Examples include but are not limited to:* *Labs, open-ended essays, voice recordings, videos, presentations, discussion boards, graphic organizers, songs, skits, dioramas, visual projects (posters, dioramas)* List the task(s), then explain how the student will demonstrate the transfer of knowledge or skill involved in the task(s) (reference Stage 1, Item #4): *Generate equations and representations that can be used to solve world problems and check for reasonableness of solutions.* *Write and solve equations from word problems and then test for reasonableness of answers, including rounding up or down, as appropriate.*
	OTHER SUMMATIVE ASSESSMENTS—can include factual recall
	Examples include but are not limited to final projects, research papers, quizzes and tests. List the assessments: *Quizzes and Tests*

Stage 3 – Learning Plan		
NETS for Students	**Learning Activities**	**Progress Monitoring/Formative Assessment**
NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live	Questions to consider while planning: ● Are transfer and acquisition addressed in the learning plan? ● Does the learning plan reflect principles of learning and best practices? ● Is there tight alignment with Stages 1 and 2?	● **How will you monitor students' progress toward acquisition, meaning, and transfer during learning activities?** Daily assessments, teacher observation of students in□ class performance, teacher observation during peer share□out sessions, notebook assessment

<table>
<tr>
<td rowspan="2">productively in an increasingly global and digital world.

Critical Thinking
Technology Operations</td>
<td colspan="2">● Is the plan likely to be engaging and effective for all students?</td>
<td>● What are potential rough spots and student misunderstandings?
Students forget to isolate the absolute value before splitting into two equations.
Students forget to spit the absolute value equation into two equations.
When multiplying or dividing by a negative number, the inequality sign switches direction.
Students have difficulty setting up solving percent problems.
Calculations with percents need to be converted to decimals before doing calculations.
Students forget to how to change decimals to percents and percents to decimals.
● How will students get the feedback they need?
Graded assessment, teacher observation immediate feedback, peer feedback, mid□chapter quiz, xtramath, notebook assessment</td>
</tr>
<tr>
<td>List planned activities
(examples include but are not limited to: experiments, guided reading, worksheets, discussions, note-taking, research, games):

Highlighter activity: practice isolating the absolute value and highlighting it prior to splitting into two equations.

Absolute Value Foldable: Solve and graph 6 different types of equations/inequalities (one solution, no solution, all real numbers). 3 equations - 3 inequalities. Create a foldable with the equations/inequalities on</td>
<td>List resources required
(examples include but are not limited to: laptops, iPads, websites, digital cameras, magazines, Blackboard, textbooks, novels, primary source documents, other non-fiction text, lab equipment, maps, translator, calculators)

Textbook, laptops, whiteboard, graph paper white boards, document camera, calculators, highlighters</td>
<td>FORMATIVE ASSESSMENTS—any non-graded, diagnostic assessment administered prior to or during a unit that reflects prior knowledge, skill levels, and potential misconceptions.

Examples include but are not limited to: Pre-tests, clickers (CPS), mini whiteboards, entrance and exit tickets, CDTs, DIBELS, Aimsweb

Study island, mini whiteboards, Kahoot, Google Classroom, Spartan Docs, Xtramath, Quizlet</td>
</tr>
</table>

	the outside, solutions on the inside flap, and graph in the center. note-taking, worksheets, classwork, homework, Study Island		

Southern Lehigh School District

UbD Curriculum Template

Course: Algebra IB **Unit: 4 - Functions** **Grades: 8, 9**

Teacher Team: Viola, Bronfenbrenner **Date: October, 2016**

Stage 1 – Desired Results

Established Goals

1. What 21st Century Essentials included in the mission statement will this unit address?

   Transfer of Learning
   Career Planning and Life-Long Learning
   Problem Solving

2. What content standards will this unit address?

   - ELA PA Core State Standards
   - Math PA Core State Standards

   CC.2.1.7.E.1 Apply and extend previous understandings of operations with Fractions to operations with rational numbers
   CC.2.2.7.8.1 Apply properties of operations to generate equivalent expressions numbers

   CC.2.2.7.B.1 Apply properties of operations to generate equivalent expressions.
   CC.2.2.8.B.2 Understand the connections between proportional

Enduring Understandings/Transfer

Written as a declarative statement, an enduring understanding is a "big idea" that focuses on larger concepts, principles, and processes that go beyond discrete facts or skills. Enduring Understandings are applicable to new situations across content areas and TRANSFERABLE (the ability to learn in one context and apply to a new situation, particularly outside of the classroom) to the real world.

3. List the Enduring Understanding(s):
   a. *How can you represent and describe functions?*
   b. *Can functions describe real-world situations?*
   c. *What is the difference between independent and dependent variables?*
   d. *Communicate mathematical concepts to peers, teachers, and instructional assistants in a safe and encouraging environment.*

4. What do you want students to do with this knowledge or skill beyond this course? What is Transfer?

a. Students will make sense of and persevere in solving complex and novel mathematical problems.
b. Students will use effective mathematical reasoning to construct viable arguments and critique the reasoning of others.
c. Students will communicate precisely when making mathematical statements and express answers with a degree of precision appropriate for the context of the problem/situation.
d. Students will apply mathematical knowledge to analyze and model situations/relationships using multiple representations and appropriate tools in order to make decisions, solve problems, and draw conclusions.
e. Students will make use of structure and repeated reasoning to gain a mathematical perspective and formulate generalized problem solving strategies.

Essential Questions

What thought-provoking questions will foster inquiry, meaning-making, and transfer?

5. List the Essential Question(s) that students should ponder, wonder about or explain by the end of this unit:
   a. *How can you represent and describe functions?*
   b. *How can functions describe real world situations?*
   c. *How do you represent domain and range?*
   d. *How can domain and range be represented using inequalities and interval notation?*

relationships, lines, and linear equations.
CC.2.2.8.C.1 Define, evaluate, and compare functions.
CC.2.2.8.C.2 Use concepts of functions to model relationships between quantities.
CC.2.2.HS.C.1 Use the concept and notation of functions to interpret and apply them in terms of their context.
CC.2.2.HS.C.2 Graph and analyze functions and use their properties to make connections between the different representations.
CC.2.2.HS.C.3 Write functions or sequences that model relationships between two quantities.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi□step problems.
CC.2.2.HS.C.6 Interpret functions in terms of the situations they model.

- PA Content Standards

Acquisition	
Students will know...	**Students will be skilled at... (be able to do)**
6. What facts should students know and be able to use to gain further knowledge? *graphing ordered pairs* *compare and order numbers* 7. What vocabulary should students know and be able to recall? *Tier 2:* *apply, distinguish, estimate, compare, contrast, develop, understand, analyze, define, determine, identify, perform, interpret, compare, construct, describe, extend, represent, extend, explain, represent, create, relationships, display, simplify, inferences, predict, model* *Tier 3:* *independent, dependent, domain, range, x-axis, y-axis, vertical line test, function notation, interval notation, infinity, units of measurement, relation, function, table of values, ordered pairs* 8. What basic concepts should students know and be able to recall and apply? *identify and list domain and range* *f(x) is the same as y* *the x-axis is the independent axis (domain)* *the y-axis is the dependent axis (range)* *rules to determine a function*	9. What discrete skill and processes should students be able to demonstrate? *A1.2.1.1.1 Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically* *A1.2.1.1.2 Determine whether a relation is a function, given a set of points or a graph.* *A1.2.1.1.3 Identify the domain or range of a relation (may be presented as ordered pairs, a graph, or a table).* *A1.2.1.2.1 Create, interpret, and/or use the equation, graph, or table of a linear function.* *A1.2.1.2.2 Translate from one representation of a linear function to another (i.e., graph, table, and equation).*

Stage 2 – Evidence	
NETS for Students	**PERFORMANCE TASK(S)—can include transfer tasks and Project-Based Learning**
NETS—National Educational Technology Standards; i.e., the	*Examples include but are not limited to:*
standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world. *Critical Thinking* *Technology Operations*	*Labs, open-ended essays, voice recordings, videos, presentations, discussion boards, graphic organizers, songs, skits, dioramas, visual projects (posters, dioramas)* List the task(s), then explain how the student will demonstrate the transfer of knowledge or skill involved in the task(s) (reference Stage 1, Item #4): *a. Students explain how to verify that a relation is a function* *b. Students translate functions numerically, graphically, verbally, and algebraically* **OTHER SUMMATIVE ASSESSMENTS—can include factual recall** *Examples include but are not limited to final projects, research papers, quizzes and tests.* List the assessments: *Quizzes and Tests*

Stage 3 – Learning Plan		
NETS for Students	**Learning Activities**	**Progress Monitoring/Formative Assessment**
NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world. *Critical Thinking* *Technology Operations*	Questions to consider while planning: ● Are transfer and acquisition addressed in the learning plan? ● Does the learning plan reflect principles of learning and best practices? ● Is there tight alignment with Stages 1 and 2? ● Is the plan likely to be engaging and effective for all students?	● **How will you monitor students' progress toward acquisition, meaning, and transfer during learning activities?** Daily assessments, teacher observation of students in class performance, teacher observation during peer share out sessions, notebook assessment ● **What are potential rough spots and student misunderstandings?** remembering domain is x and range is y. rules for listing domain and range forgetting to put parentheses around negative numbers when calculating values graphing ordered pairs identifying independent and dependent variables from word problems. ● **How will students get the feedback they need?** Graded assessment, teacher observation immediate feedback, peer feedback, mid chapter quiz, xtramath, notebook assessment

	List planned activities *(examples include but are not limited to: experiments, guided reading, worksheets, discussions, note-taking, research, games)*: Battleship: students play coordinate battle ship using ordered pairs. Pattern Activity: given a group of functions, identify the pattern that forms. Graphing calculator activity: type equations into graphing calculator to verify that their functions are graphed correctly. worksheets, classwork, homework, Study Island	**List resources required** *(examples include but are not limited to: laptops, iPads, websites, digital cameras, magazines, Blackboard, textbooks, novels, primary source documents, other non-fiction text, lab equipment, maps, translator, calculators)* Textbook, laptops, whiteboard, graph paper white boards, document camera, calculators, highlighters	**FORMATIVE ASSESSMENTS—any non-graded, diagnostic assessment administered prior to or during a unit that reflects prior knowledge, skill levels, and potential misconceptions.** *Examples include but are not limited to: Pre-tests, clickers (CPS), mini whiteboards, entrance and exit tickets, CDTs, DIBELS, Aimsweb* Study island, mini whiteboards, Kahoot, Google Classroom, Spartan Docs, Xtramath, Quizlet

Southern Lehigh School District

UbD Curriculum Template

Course: Algebra IB **Unit: 5 -Linear Functions** **Grades: 8, 9**

Teacher Team: Viola, Bronfenbrenner **Date: October, 2016**

Stage 1 – Desired Results

Established Goals

1. What 21st Century Essentials included in the mission statement will this unit address?

   Transfer of Learning
   Career Planning and Life-Long Learning
   Problem Solving

2. What content standards will this unit address?

   - ELA PA Core State Standards
   - Math PA Core State Standards
     CC.2.1.7.E.1 Apply and extend previous understandings of operations with fractions to operations with rational numbers

Enduring Understandings/Transfer

Written as a declarative statement, an enduring understanding is a "big idea" that focuses on larger concepts, principles, and processes that go beyond discrete facts or skills. Enduring Understandings are applicable to new situations across content areas and TRANSFERABLE (the ability to learn in one context and apply to a new situation, particularly outside of the classroom) to the real world.

3. List the Enduring Understanding(s):

   a. Can functions describe real world situations?
   b. What information does the equation of a line give you?
   c. What does the slope of a line indicate about the line?
   d. A line on a graph can be represented by a linear equation.
   e. The equation of a line can be written in multiple forms.
   f. The relationship between two lines can be determined by comparing their slopes and y intercepts.
   g. Communicate mathematical concepts to peers, teachers, and instructional assistants in a safe and encouraging environment.

4. What do you want students to do with this knowledge or skill beyond this course? What is Transfer?

   a. Students will make sense of and persevere in solving complex and novel mathematical problems.
   b. Students will use effective mathematical reasoning to construct viable arguments and critique the reasoning of others.
   c. Students will communicate precisely when making mathematical statements and express answers with a degree of precision appropriate for the context of the problem/situation.
   d. Students will apply mathematical knowledge to analyze and model situations/relationships using multiple representations and appropriate tools in order to make decisions, solve problems, and draw conclusions.
   e. Students will make use of structure and repeated reasoning to gain a mathematical perspective and formulate generalized problem solving strategies

Essential Questions

What thought-provoking questions will foster inquiry, meaning-making, and transfer?

CC.2.2.7.B.1 Apply properties of operations to generate equivalent expressions.
CC.2.2.8.B.2 Understand the connections between proportional relationships, lines, and linear equations.
CC.2.2.8.B.3 Analyze and solve linear equations and pairs of simultaneous linear equations.
CC.2.2.8.C.1 Define, evaluate, and compare functions.
CC.2.2.8.C.2 Use concepts of functions to model relationships between quantities.
CC.2.2.HS.C.1 Use the concept and notation of functions to interpret and apply them in terms of their context.
CC.2.2.HS.C.2 Graph and analyze functions and use their properties to make connections between the different representations.
CC.2.2.HS.C.3 Write functions or sequences that model relationships between two quantities.
CC.2.4.HS.B.2 Summarize, represent, and interpret data on two categorical and quantitative variables.
CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs, and data displays.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi□step problems.
CC.2.2.HS.C.6 Interpret functions in terms of the situations they model.
CC.2.2.HS.C.5 Construct and compare linear, quadratic, and exponential models to solve problems.

5. List the Essential Question(s) that students should ponder, wonder about or explain by the end of this unit:
   a. *How can you represents and describe linear equations?*
   b. *How can linear functions describe real-world situations?*

Acquisition

Students will know...

6. What facts should students know and be able to use to gain further knowledge?

ordered pairs
domain and range
x and y axis
lines can have a positive slope /
*lines can have a negative slope *
lines can have a slope of zero (horizontal line)
lines can have no slope (vertical line)

7. What vocabulary should students know and be able to recall?

Tier 2:
apply, distinguish, estimate, compare, contrast, develop, understand, analyze, define, determine, identify, perform, derive, interpret, compare, construct, describe, extend, represent, extend, explain, represent, create, relationships, display, simplify, inferences, predict, model

Tier 3:
translate, derive the equation, dependent variable, independent variable, domain, range, linear, non-linear, linear equation, parallel lines, perpendicular lines, point-slope form, rate of change, slope, slope-intercept form, standard form, x intercept, y intercept, table of x an y values, ordered pairs of coordinates, changes in x and y values.

]

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

9. What discrete skill and processes should students be able to demonstrate?

A1.1.2.1.1 Write, solve, and/or apply a linear equation (including problem situations).
A1.1.2.1.3 Interpret solutions to problems in the context of the problem situation. Note: Linear equations only.
A1.1.2.2.2 Interpret solutions to problems in the context of the problem situation. Note: Limit systems to two linear equations.
A1.2.1.1.3 Identify the domain or range of a relation (may be presented as ordered pairs, a graph, or a table)
A1.2.1.2.1 Create, interpret, and/or use the equation, graph, or table of a linear function.
A1.2.1.2.2 Translate from one representation of a linear function to another (i.e., graph, table, and equation).
A1.2.2.1.1 Identify, describe, and/or use constant rates of change.
A1.2.2.1.2 Apply the concept of linear rate of change (slope) to solve problems.
A1.2.2.1.3 Write or identify a linear equation when given • the graph of the line, • two points on the line, or • the slope and a point on the line. Note: Linear equation may be in point□slope, standard, and/or slope□intercept form.
A1.2.2.1.4 Determine the slope and/or y□intercept represented by a linear equation or graph

• PA Content Standards	8. What basic concepts should students know and be able to recall and apply? *Students will learn the best way to graph a line is using slope-intercept form.* *Students will graph a line in standard and slope-intercept form.* *Students will calculate the equation of a line given appropriate information.* *Students will check to see if a solution is valid. Students will calculate intercepts.* *Students will determine parallel and perpendicular lines and write their equations.*	

Stage 2 –	
NETS for Students	**PERFORMANCE TASK(S)—can include transfer tasks and Project-Based Learning**
NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world. *Critical Thinking* *Technology Operations*	*Examples include but are not limited to:* *Labs, open-ended essays, voice recordings, videos, presentations, discussion boards, graphic organizers, songs, skits, dioramas, visual projects (posters, dioramas)* List the task(s), then explain how the student will demonstrate the transfer of knowledge or skill involved in the task(s) (reference Stage 1, Item #4): *a. Students form expressions, equations (in different forms), or inequalities from real world context and connect symbolic and graphical representations as they apply algebraic concepts to the context.* *b. Students translate functions numerically, graphically, verbally, and algebraically*
	OTHER SUMMATIVE ASSESSMENTS—can include factual recall
	Examples include but are not limited to final projects, research papers, quizzes and tests. List the assessments: *Quizzes and Tests, Linear Functions Book, Dog House Final Project*

Stage 3 – Learning Plan

<table>
<tr><th>NETS for Students</th><th colspan="2">Learning Activities</th><th>Progress Monitoring/Formative Assessment</th></tr>
<tr><td rowspan="2">NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world.

Critical Thinking
Technology Operations</td><td colspan="2">Questions to consider while planning:
● Are transfer and acquisition addressed in the learning plan?
● Does the learning plan reflect principles of learning and best practices?
● Is there tight alignment with Stages 1 and 2?
● Is the plan likely to be engaging and effective for all students?</td><td>● How will you monitor students' progress toward acquisition, meaning, and transfer during learning activities?
Daily assessments, teacher observation of students in class performance, teacher observation during peer share out sessions, linear functions book, notebook assessment
● What are potential rough spots and student misunderstandings?
Algebraic errors when manipulating the equation
Errors when graphing linear equations, especially slope
Finding slope from a graph
using equations correctly to graph
difference between horizontal and vertical lines
using the slope formula correctly (double negatives)
interval notation for domain and range
● How will students get the feedback they need?
Graded assessment, teacher observation immediate feedback, peer feedback, mid chapter quiz, demos</td></tr>
<tr><td>List planned activities
(examples include but are not limited to: experiments, guided reading, worksheets, discussions, note-taking, research, games):

Linear Functions Book: students complete a book of problems with one component for each linear function already filled in. They must fill in the remaining components (draw the line, write slope and y-intercept, write the equation in slope-intercept</td><td>List resources required
(examples include but are not limited to: laptops, iPads, websites, digital cameras, magazines, Blackboard, textbooks, novels, primary source documents, other non-fiction text, lab equipment, maps, translator, calculators)

Textbook, laptops, whiteboard, graph paper white boards, document camera, calculators, rulers</td><td>FORMATIVE ASSESSMENTS—any non-graded, diagnostic assessment administered prior to or during a unit that reflects prior knowledge, skill levels, and potential misconceptions.

Examples include but are not limited to: Pre-tests, clickers (CPS), mini whiteboards, entrance and exit tickets, CDTs, DIBELS, Aimsweb

Study Island, mini whiteboards, Kahoot, demos</td></tr>
</table>

	form, complete a table, and describe the graph). Demos Activity: students must graph a set of lines to duplicate a picture. They must use interval notation for domain and range to make the line segments start and stop at the correct points. worksheets, classwork, homework, Study Island		

Southern Lehigh School District

UbD Curriculum Template

Course: Algebra IB **Unit: 6 - Systems of Equations** **Grades: 8, 9**

Teacher Team: Viola, Bronfenbrenner **Date: October, 2016**

Stage 1 – Desired Results

Established Goals

1. What 21st Century Essentials included in the mission statement will this unit address?

   Transfer of Learning
   Career Planning and Life-Long Learning
   Problem Solving

2. What content standards will this unit address?

   - ELA PA Core State Standards
   - Math PA Core State Standards

   CC.2.1.7.E.1 Apply and extend previous understandings of operations with fractions to operations with rational numbers.
   CC.2.2.7.B.1 Apply properties of operations to generate equivalent expressions.
   CC.2.2.8.B.3 Analyze and solve linear equations and pairs of simultaneous linear equations.

   CC.2.2.HS.D.7 Create and graph equations or inequalities to describe numbers or relationships.

Enduring Understandings/Transfer

Written as a declarative statement, an enduring understanding is a "big idea" that focuses on larger concepts, principles, and processes that go beyond discrete facts or skills. Enduring Understandings are applicable to new situations across content areas and TRANSFERABLE (the ability to learn in one context and apply to a new situation, particularly outside of the classroom) to the real world.

3. List the Enduring understanding(s):
   a. Systems of linear equations and inequalities can be used to model problems.
   b. Systems of equations can be solved by graphing, substitution, or elimination.
   c. Solutions to systems of equations can vary from no solution to infinite solutions.
   d. Solutions to systems of inequalities must be graphed.
   e. Solutions to systems of equations and inequalities must be interpreted within the context of the problem.
   f. Communicate mathematical concepts to peers, teachers, and instructional assistants in a safe and encouraging environment.

4. What do you want students to do with this knowledge or skill beyond this course? What is Transfer?
   a. Students will make sense of and persevere in solving complex and novel mathematical problems.
   b. Students will use effective mathematical reasoning to construct viable arguments and critique the reasoning of others.
   c. Students will communicate precisely when making mathematical statements and express answers with a degree of precision appropriate for the context of the problem/situation.
   d. Students will apply mathematical knowledge to analyze and model situations/relationships using multiple representations and appropriate tools in order to make decisions, solve problems, and draw conclusions.
   e. Students will make use of structure and repeated reasoning to gain a mathematical perspective and formulate generalized problem solving strategies

Essential Questions

What thought-provoking questions will foster inquiry, meaning-making, and transfer?

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.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

- PA Content Standards

5. List the Essential Question(s) that students should ponder, wonder about or explain by the end of this unit:

a. How can you solve a system of equations or inequalities?
b. Where is the solution set for a system of equations or inequalities?
c. How can systems of equations or inequalities model real□world situations?
d. How do you decide which method would be easier to solve a particular system of equations?

Acquisition

Students will know...

6. What facts should students know and be able to use to gain further knowledge?
slope, y-intercept, coordinate points, equation of a line, point slope equation

7. What vocabulary should students know and be able to recall?
Tier 2:
apply, distinguish, estimate, compare, contrast, develop, understand, analyze, define, determine, identify, perform, derive, interpret, compare, construct, describe, extend, represent, extend, explain, represent, create, relationships, display, simplify, inferences, predict, model
Tier 3:
elimination method, substitution method, inconsistent, independent, dependent, linear inequality, solution of a system of linear equations/inequalities, table of x and y values, ordered pairs of coordinates, changes in x and y values, points plotted in a line, sections on coordinate plane created by intersecting lines, test points from each section

8. What basic concepts should students know and be able to recall and apply?
Solve a system using elimination, substitution, and graphing. Students will know how to choose which method to use.

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

9. What discrete skill and processes should students be able to demonstrate?
A1.1.2.1.1 Write, solve, and/or apply a linear equation (including problem situations).
A1.1.2.1.3 Interpret solutions to problems in the context of the problem situation. Note: Linear equations only.
A1.1.2.2.1 Write and/or solve a system of linear equations (including problem situations) using graphing, substitution, and/or elimination. Note: Limit systems to two linear equations.
A1.1.2.2.2 Interpret solutions to problems in the context of the problem situation. Note: Limit systems to two linear equations.
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).
A1.1.3.2.1 Write and/or solve a system of linear inequalities using graphing. Note: Limit systems to two linear inequalities.
A1.1.3.1.3 Interpret solutions to problems in the context of the problem situation. Note: Linear inequalities only.
A1.1.3.2.2 Interpret solutions to problems in the context of the problem situation. Note: Limit systems to two linear inequalities.

Stage 2 – Evidence	
NETS for Students	**PERFORMANCE TASK(S)—can include transfer tasks and Project-Based Learning**
NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world. *Critical Thinking* *Technology Operations*	*Examples include but are not limited to:* *Labs, open-ended essays, voice recordings, videos, presentations, discussion boards, graphic organizers, songs, skits, dioramas, visual projects (posters, dioramas)* List the task(s), then explain how the student will demonstrate the transfer of knowledge or skill involved in the task(s) (reference Stage 1, Item #4): *a. Generate equations and representations that can be used to solve word problems and check for reasonableness of solutions.* *b. Making choices to know when to: buy annual pass or pay daily, buy refillable cup or pay daily, drive to airport and park or take shuttle, etc*
	OTHER SUMMATIVE ASSESSMENTS—can include factual recall
	Examples include but are not limited to final projects, research papers, quizzes and tests. List the assessments: *Tests and Quizzes*

Stage 3 – Learning Plan		
NETS for Students	**Learning Activities**	**Progress Monitoring/Formative Assessment**
NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world. *Critical Thinking* *Technology Operations*	Questions to consider while planning: ● Are transfer and acquisition addressed in the learning plan? ● Does the learning plan reflect principles of learning and best practices? ● Is there tight alignment with Stages 1 and 2? ● Is the plan likely to be engaging and effective for all students?	● **How will you monitor students' progress toward acquisition, meaning, and transfer during learning activities?** Daily assessments, teacher observation of students in class performance, teacher observation during peer share out sessions, notebook assessment ● **What are potential rough spots and student misunderstandings?** *Correctly graphing a linear equation* *Correctly graphing and shading a linear inequality*

			For elimination, students lose negative signs when distributing. *If solving algebraically, systems with no solution or infinitely many solutions are difficult to interpret.* ● **How will students get the feedback they need?** Graded assessment, teacher observation immediate feedback, peer feedback, mid□chapter quiz, notebook assessment
	List planned activities *(examples include but are not limited to: experiments, guided reading, worksheets, discussions, note-taking, research, games)*: Systems Stations Activity: students move from station to station doing problems from each method of solving systems of equations. They have to complete the problems correctly at each station before moving onto the next station. note-taking, worksheets, classwork, Study Island, homework	**List resources required** *(examples include but are not limited to: laptops, iPads, websites, digital cameras, magazines, Blackboard, textbooks, novels, primary source documents, other non-fiction text, lab equipment, maps, translator, calculators)* Textbook, laptops, whiteboard, graph paper white boards, document camera, calculators, rulers, colored pencils	**FORMATIVE ASSESSMENTS—any non-graded, diagnostic assessment administered prior to or during a unit that reflects prior knowledge, skill levels, and potential misconceptions.** *Examples include but are not limited to: Pre-tests, clickers (CPS), mini whiteboards, entrance and exit tickets, CDTs, DIBELS, Aimsweb* interactive whiteboard , Study Island, mini whiteboards, Kahoot

Southern Lehigh School District

UbD Curriculum Template

Course: Algebra IB | **Unit: 7: Polynomials (FOIL, factoring, rational expressions)** | **Grades: 8,9**

Teacher Team: Viola, Bronfenbrenner | **Date: October, 2016**

Stage 1 – Desired Results

Established Goals	Enduring Understandings/Transfer
1. What 21st Century Essentials included in the mission statement will this unit address? *Transfer of Learning* *Career Planning and LIfe-Long Learning* *Problem-Solving* 2. What content standards will this unit address? ● ELA PA Core State Standards ● Math PA Core State Standards CC.2.1.7.E.1 Apply and extend previous understandings of operations with fractions to operations with rational numbers. CC.2.2.7.B.3 Model and solve real□ world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations. CC.2.3.7.A.1 Solve read□ world and mathematical problems	**Written as a declarative statement, an enduring understanding is a "big idea" that focuses on larger concepts, principles, and processes that go beyond discrete facts or skills. Enduring Understandings are applicable to new situations across content areas and TRANSFERABLE (the ability to learn in one context and apply to a new situation, particularly outside of the classroom) to the real world.** 3. List the Enduring Understanding(s): *a. Squaring a number and finding the square root are inverse operations.* *b. The square root of a non□perfect square is an irrational number* *c. Polynomials can be added, subtracted, multiplied and divided.* *d. Polynomials can be named according to number of terms and degree.* *e. Factoring quadratics when a=1 (a not equal to zero is optional)* *f. Find the GCF of a polynomial* *g. Find the zeros of a quadratic function* *h. Factoring special cases such as difference of squares and perfect squares* *i. simplify/reduce rational algebraic expressions .* *j. Communicate mathematical concepts to peers, teachers, and instructional assistants in a safe and encouraging environment.* 4. What do you want students to do with this knowledge or skill beyond this course? What is Transfer? *a. Students will make sense of and persevere in solving complex and novel mathematical problems.* *b. Students will use effective mathematical reasoning to construct viable arguments and critique the reasoning of others.* *c. Students will communicate precisely when making mathematical statements and express answers with a degree of precision appropriate for the context of the problem/situation.* *d. Students will apply mathematical knowledge to analyze and model situations/relationships using multiple representations and appropriate tools in order to make decisions, solve problems, and draw conclusions.* *e. Students will make use of structure and repeated reasoning to gain a mathematical perspective and formulate generalized problem solving strategies*

involving angle measure, area, surface area, circumference, and volume.
CC.2.1.8.E.1 Distinguish between rational and irrational numbers using their properties.
CC.2.1.8.E.4 Estimate irrational numbers by comparing them to rational numbers.
CC.2.2.8.B.1 Apply concepts of radicals and integer exponents to generate equivalent expressions.
CC.2.3.8.A.1 Apply the concepts of volume of cylinders, cones, and spheres to solve real world and mathematical problems.
CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.
CC.2.1.HS.F.1 Apply and extend the properties of exponents to solve problems with rational exponents. CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.
CC.2.2.HS.D.1 Interpret the structure of expressions to represent a quantity in terms of its context.
CC.2.2.HS.D.2 Write expressions in equivalent forms to solve problems. CC.2.2.HS.D.3 Extend the knowledge of arithmetic operations and apply to polynomials.
CC.2.2.HS.D.5 Use polynomial identities to solve problems.

f. Given a word problem, students will solve the word problem using an appropriate strategy or strategies and will share and compare the use of multiple strategies leading to the same answer.

Essential Questions

What thought-provoking questions will foster inquiry, meaning-making, and transfer?

5. List the Essential Question(s) that students should ponder, wonder about or explain by the end of this unit:

a. How do you compare numbers?
b. How does the use of exponents make representing quantities more efficient?
c. How can two algebraic expressions that appear to be different be equivalent?
d. How are the properties of real numbers related to polynomials?
e. How can you solve a quadratic equations?
f. How can you use functions to model real-world situations?
g. How are rational expressions represented?
h. How can you solve a rational equation?

Acquisition

Students will know...

6. What facts should students know and be able to use to gain further knowledge?

To multiply numbers with the same base, add the exponents
To divide numbers with the same base, subtract the exponents
rules for finding the degree of a polynomial
what is a term and how do I count them
GCF of numbers

7. What vocabulary should students know and be able to recall?

Tier 2:
apply, distinguish, estimate, compare, contrast, develop, understand, analyze, define, determine, identify, perform, derive, interpret, compare, construct, describe, extend, represent, extend, explain, represent, create, relationships, display, simplify, inferences, predict, model
Tier 3:

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

9. What discrete skill and processes should students be able to demonstrate?

A1.1.1.2.1 Find the Greatest Common Factor (GCF) and/or the Least Common Multiple (LCM) for sets of Monomials.
A1.1.1.3.1 Simplify/evaluate expressions involving properties/laws of exponents, roots, and/or absolute values to solve problems. Note: Exponents should be integers from –10 to 10
A1.1.1.5.1 Add, subtract, and/or multiply polynomial expressions (express answers in simplest form)
A1.1.1.5.2 Factor algebraic expressions, including difference of squares and trinomials. Note: Trinomials are limited to the form ax2 + bx + c where a is equal to 1 after factoring out all monomial factors
A1.1.1.5.3 Simplify/reduce a rational algebraic expression.

CC.2.2.HS.D.6 Extend the knowledge of rational functions to rewrite in equivalent forms. ● PA Content Standards	*exponent, square root, rational, irrational, monomial, binomial, trinomial, polynomial, perfect square trinomial, standard form, degree of monomial/polynomial, terms, like terms, positive, negative, simplify, add, subtract, FOIL, linear, quadratic, cubic, quartic, quintic, quadratic function, GCF, LCM, factor tree, pairs, prime factors, distribute, exponent, rational function, rational expression, rational equation, common factor, reduce, lowest terms, simplify, cancel* 8. What basic concepts should students know and be able to recall and apply? *Multiply and divide expressions in exponent form* *Combining like terms* *how to multiply monomials, binomials, and binomials and trinomials* *Find the GCF of a polynomial* *knowing difference between factors and a term* *Recognize like terms, evaluate and write variable expressions and equations*	

Stage 2 – Evidence	
NETS for Students	**PERFORMANCE TASK(S)—can include transfer tasks and Project-Based Learning**
NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world. *Critical Thinking*	*Examples include but are not limited to:* *Labs, open-ended essays, voice recordings, videos, presentations, discussion boards, graphic organizers, songs, skits, dioramas, visual projects (posters, dioramas)* List the task(s), then explain how the student will demonstrate the transfer of knowledge or skill involved in the task(s) (reference Stage 1, Item #4): *a. Students will represent positive and negative exponents in a table to find patterns and relationships.* *b. Generate equations and representations that can be used to solve word problems and check for reasonableness of solutions.*

Technology Operations	**OTHER SUMMATIVE ASSESSMENTS—can include factual recall**
	Examples include but are not limited to final projects, research papers, quizzes and tests. List the assessments: *Quizzes and Tests*

Stage 3 – Learning Plan		
NETS for Students	**Learning Activities**	**Progress Monitoring/Formative Assessment**
NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world. *Critical Thinking* *Technology Operations*	Questions to consider while planning: ● Are transfer and acquisition addressed in the learning plan? ● Does the learning plan reflect principles of learning and best practices? ● Is there tight alignment with Stages 1 and 2? ● Is the plan likely to be engaging and effective for all students?	● **How will you monitor students' progress toward acquisition, meaning, and transfer during learning activities?** Daily assessments, teacher observation of students in class performance, teacher observation during peer share out sessions, notebook assessment ● **What are potential rough spots and student misunderstandings?** Students mistakenly multiply the numerical bases when calculating the product of two or more exponential expressions with numerical Failure to perform the correct operation of coefficients and/or exponents Students forget that if there is not an exponents then it is 1 Improperly simplify negative exponents not setting each factor equal to zero when solving forgetting laws of exponents do not know multiplication facts, especially with negative numbers ● **How will students get the feedback they need?** Graded assessment, teacher observation immediate feedback, peer feedback, mid chapter quiz, notebook assessment

	List planned activities *(examples include but are not limited to: experiments, guided reading, worksheets, discussions, note-taking, research, games)*: learnalberta.ca Math Interactives: Exploring Laws of Exponents - Site Dig: correctly simplify exponents using the laws of exponents to complete the archeological dig of their choice. Polynomials Matching Game: match the product to the correct polynomial. Baseball activity: setting up the x to factor (ac on top, b on bottom, factors on 1st and 3rd base) note taking, worksheets, classwork, homework, Study Island	**List resources required** *(examples include but are not limited to: laptops, iPads, websites, digital cameras, magazines, Blackboard, textbooks, novels, primary source documents, other non-fiction text, lab equipment, maps, translator, calculators)* Textbook, laptops, whiteboard, graph paper white boards, document camera, calculators, highlighters, colored pencils, scissors	**FORMATIVE ASSESSMENTS—any non-graded, diagnostic assessment administered prior to or during a unit that reflects prior knowledge, skill levels, and potential misconceptions.** *Examples include but are not limited to: Pre-tests, clickers (CPS), mini whiteboards, entrance and exit tickets, CDTs, DIBELS, Aimsweb* Study island, mini whiteboards, Kahoot, Google Classroom, Spartan Docs, Xtramath, Quizlet

Southern Lehigh School District

UbD Curriculum Template

Course: Algebra I B **Unit: Unit 8: Radicals** **Grades: 8, 9**

Teacher Team: Viola, Bronfenbrenner **Date: October, 2016**

Stage 1 – Desired Results	
Established Goals	**Enduring Understandings/Transfer**
1. What 21st Century Essentials included in the mission statement will this unit address? *Transfer of Learning* *Career Planning and Life-Long Learning* *Problem Solving* 2. What content standards will this unit address? ● ELA PA Core State Standards ● Math PA Core State Standards CC.2.2.7.B.3 Model and solve real□ world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations. CC.2.1.7.E.1 Apply and extend previous understandings of operations with fractions to operations with rational numbers.	**Written as a declarative statement, an enduring understanding is a "big idea" that focuses on larger concepts, principles, and processes that go beyond discrete facts or skills. Enduring Understandings are applicable to new situations across content areas and TRANSFERABLE (the ability to learn in one context and apply to a new situation, particularly outside of the classroom) to the real world.** 3. List the Enduring Understanding(s): *a. Radicals can be simplified* *b. Operations can performed on radicals (addition, subtraction, multiplication, division)* *c. The Pythagorean theorem is used to find the missing portion of a right triangle.* *d. Communicate mathematical concepts to peers, teachers, and instructional assistants in a safe and encouraging environment.* 4. What do you want students to do with this knowledge or skill beyond this course? What is Transfer? *a. Students will make sense of and persevere in solving complex and novel mathematical problems.* *b. Students will use effective mathematical reasoning to construct viable arguments and critique the reasoning of others.* *c. Students will communicate precisely when making mathematical statements and express answers with a degree of precision appropriate for the context of the problem/situation.* *d. Students will apply mathematical knowledge to analyze and model situations/relationships using multiple representations and appropriate tools in order to make decisions, solve problems, and draw conclusions.* *e. Students will make use of structure and repeated reasoning to gain a mathematical perspective and formulate generalized problem solving strategies* *f. Given a word problem, students will solve the word problem using an appropriate strategy or strategies and will share and compare the use of multiple strategies leading to the same answer*

CC.2.1.8.E.1 Distinguish between rational and irrational numbers using their properties.
CC.2.1.8.E.4 Estimate irrational numbers by comparing them to rational numbers.
CC.2.2.8.B.1 Apply concepts of radicals and integer exponents to generate equivalent expressions.
CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.
CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real□world or mathematical problems.
CC.2.1.HS.F.1 Apply and extend the properties of exponents to solve problems with rational exponents.
CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.

- PA Content Standards

Essential Questions

What thought-provoking questions will foster inquiry, meaning-making, and transfer?

5. List the Essential Question(s) that students should ponder, wonder about or explain by the end of this unit:
   a. How and why do you simplify radicals?
   b. How can you solve a radical equation?

Acquisition

Students will know...

6. What facts should students know and be able to use to gain further knowledge?
   Multiplication facts
   Perfect Squares

7. What vocabulary should students know and be able to recall?

Tier 2:
apply, distinguish, estimate, compare, contrast, develop, understand, analyze, define, determine, identify, perform, derive, interpret, compare, construct, describe, extend, represent, extend, explain, represent, create, relationships, display, simplify, inferences, predict, model

Tier 3:
hypotenuse, Pythagorean Theorem, radical expression, like radicals, square root functions, square numbers, integer square roots

8. What basic concepts should students know and be able to recall and apply?
   Simplify square roots
   Estimate square roots and compare them
   Solve right triangle problems using the Pythagorean Thearem

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

9. What discrete skill and processes should students be able to demonstrate?

A1.1.1.1.2 Simplify square roots (e.g., $\sqrt{24} = 2\sqrt{6}$).
A1.1.1.3.1 Simplify/evaluate expressions involving properties/laws of exponents, roots, and/or absolute values to solve problems. Note: Exponents should be integers from –10 to 10

Stage 2 – Evidence	
NETS for Students	**PERFORMANCE TASK(S)—can include transfer tasks and Project-Based Learning**
NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world. *Critical Thinking* *Technology Operations*	*Examples include but are not limited to:* *Labs, open-ended essays, voice recordings, videos, presentations, discussion boards, graphic organizers, songs, skits, dioramas, visual projects (posters, dioramas)* List the task(s), then explain how the student will demonstrate the transfer of knowledge or skill involved in the task(s) (reference Stage 1, Item #4): *a. Generate equations and representations that can be used to solve word problems and check for reasonableness of solutions.* *b. Use the Pythagorean Theorem to solve real life problems.*
	OTHER SUMMATIVE ASSESSMENTS—can include factual recall
	Examples include but are not limited to final projects, research papers, quizzes and tests. List the assessments: *Quizzes and Tests*

Stage 3 – Learning Plan		
NETS for Students	**Learning Activities**	**Progress Monitoring/Formative Assessment**
NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world. *Critical Thinking* *Technology Operations*	Questions to consider while planning: ● Are transfer and acquisition addressed in the learning plan? ● Does the learning plan reflect principles of learning and best practices? ● Is there tight alignment with Stages 1 and 2? ● Is the plan likely to be engaging and effective for all students?	● **How will you monitor students' progress toward acquisition, meaning, and transfer during learning activities?** Daily assessments, teacher observation of students in class performance, teacher observation during peer share out sessions, notebook assessment ● **What are potential rough spots and student misunderstandings?** factoring mistakes forgetting to carry coefficients mixing up simplifying radicals (pairs on outside) adding instead of multiplying ● **How will students get the feedback they need?**

			Graded assessment, teacher observation immediate feedback, peer feedback, mid□chapter quiz, notebook assessment
	List planned activities *(examples include but are not limited to: experiments, guided reading, worksheets, discussions, note-taking, research, games)*: note-taking, worksheets, classwork, homework, Study Island	**List resources required** *(examples include but are not limited to: laptops, iPads, websites, digital cameras, magazines, Blackboard, textbooks, novels, primary source documents, other non-fiction text, lab equipment, maps, translator, calculators)* Textbook, laptops, whiteboard, graph paper white boards, document camera, calculators	**FORMATIVE ASSESSMENTS—any non-graded, diagnostic assessment administered prior to or during a unit that reflects prior knowledge, skill levels, and potential misconceptions.** *Examples include but are not limited to: Pre-tests, clickers (CPS), mini whiteboards, entrance and exit tickets, CDTs, DIBELS, Aimsweb* interactive whiteboard , Study Island, mini whiteboards, Kahoot, Xtramath

Southern Lehigh School District

UbD Curriculum Template

Course: Algebra B | **Unit 9: Probably and Statistics** | **Grades: 8, 9**

Teacher Team: Viola, Bronfenbrenner | **Date: October, 2016**

Stage 1 – Desired Results	
Established Goals	**Enduring Understandings/Transfer**
1. What 21st Century Essentials included in the mission statement will this unit address? *Transfer of Learning* *Career Planning and Life-Long Learning* *Problem-Solving* 2. What content standards will this unit address? ● ELA PA Core State Standards ● Math PA Core State Standards CC.2.4.6.B.1 Demonstrate an understanding of statistical variability by displaying, analyzing, and summarizing distributions. CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable. CC.2.4.HS.B.2 Summarize, represent, and interpret data on two categorical and quantitative variables.	**Written as a declarative statement, an enduring understanding is a "big idea" that focuses on larger concepts, principles, and processes that go beyond discrete facts or skills. Enduring Understandings are applicable to new situations across content areas and TRANSFERABLE (the ability to learn in one context and apply to a new situation, particularly outside of the classroom) to the real world.** 3. List the Enduring Understanding(s): *a. Students will make prediction based on linear models* *b. Students will be able to analyze single and graph single variable data using measures of central tendency, box and whisker plots, histogram, circle graphs and stem and leaf diagrams* *c. Students will be able to create and understand the significance of a line of best fit.* *d. Students will recognize compound and conditional probability and be able to calculate them based on various situations.* *e. Students will recognize independent versus dependent situations* *f. Communicate mathematical concepts to peers, teachers, and instructional assistants in a safe and encouraging environment.* 4. What do you want students to do with this knowledge or skill beyond this course? What is Transfer? *a. Students will make sense of and persevere in solving complex and novel mathematical problems.* *b. Students will use effective mathematical reasoning to construct viable arguments and critique the reasoning of others.* *c. Students will communicate precisely when making mathematical statements and express answers with a degree of precision appropriate for the context of the problem/situation.* *d. Students will apply mathematical knowledge to analyze and model situations/relationships using multiple representations and appropriate tools in order to make decisions, solve problems, and draw conclusions.* *e. Students will make use of structure and repeated reasoning to gain a mathematical perspective and formulate generalized problem solving strategies* *f. Given a word problem, students will solve the word problem using an appropriate strategy or strategies and will share and compare the use of multiple strategies leading to the same answer*

CC.2.4.HS.B.3 Analyze linear models to make interpretations based on the data.
CC.2.4.HS.B.4 Recognize and evaluate random processes underlying statistical experiments.
CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.
CC.2.4.HS.B.7 Apply the rules of probability to compute probabilities of compound events in a uniform probability model
CC.2.4.8.B.1 Analyze and/or interpret bivariate data displayed in multiple representations.
CC.2.4.8.B.2 Understand that patterns of association can be seen in bivariate data utilizing frequencies.
CC.2.2.7.B.3 Model and solve real□world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.
CC.2.4.7.B.3 Investigate chance processes and develop, use, and evaluate probability models.
CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.2.HS.D.2 Write expressions in equivalent forms to solve problems.

- PA Content Standards

Essential Questions

What thought-provoking questions will foster inquiry, meaning-making, and transfer?

5. List the Essential Question(s) that students should ponder, wonder about or explain by the end of this unit:
   a. How can collecting and analyzing data help you make decisions or predictions?
   b. How can you make and interpret different presentations of data?
   c. How do I recognize the difference between a problem with simple, compound or conditional probability?

Acquisition

Students will know...	**Students will be skilled at... (be able to do)**
6. What facts should students know and be able to use to gain further knowledge? *mean, median, mode, range* *what each of the types of graphs look like (bar, histogram, pie, line plot, box and whisker, stem and leaf)* *addition and multiplication of fractions and decimals* *procedure for converting fractions to decimals and percents* 7. What vocabulary should students know and be able to recall? *Tier 2:* *apply, distinguish, estimate, compare, contrast, develop, understand, analyze, define, determine, identify, perform, derive, interpret, compare, construct, describe, extend, represent, extend, explain, represent, create, relationships, display, simplify, inferences, predict, model* *Tier 3:* *mean, mode, median, range, data, outlier, analyze, predict, numeric ,categorical, quantitative, inner quartile range (IQR), quartiles, box and whisker, histograms, bar graph, pie chart, scatter plot, frequency table, line plot, total number of*	9. What discrete skill and processes should students be able to demonstrate? *A1.1.1.4.1 Use estimation to solve problems.* *A1.2.1.1.1 Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.* *A1.2.1.2.2 Translate from one representation of a linear function to another (i.e., graph, table, and equation).* *A1.2.2.1.2 Apply the concept of linear rate of change (slope) to solve problems.* *A1.2.2.2.1 Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot.* *A1.2.3.1.1 Calculate and/or interpret the range, quartiles, and interquartile range of data.* *A1.2.3.2.1 Estimate or calculate to make predictions based on a circle, line, bar graph, measure of central tendency, or other representation.* *A1.2.3.3.1 Find probabilities for compound events (e.g., find probability of red and blue, find probability of red or blue) and represent as a fraction, decimal, or percent* *A1.2.3.2.2 Analyze data, make predictions, and/or answer questions based on displayed data (box□and whisker plots, stem□and□leaf plots, scatter plots, measures of central tendency, or other*

outcomes, desired number of outcomes, ratios, percents, decimal, simple, compound, conditional, probability, experimental, theoretical 8. What basic concepts should students know and be able to recall and apply? *How to create each of the graphs - bar, histogram, pie, line plot, box and whisker, stem and leaf* *how to find the probability of an event ocurring* *how to find compound probabilities with and without replacement*	*representations).* *A1.2.3.2.3 Make predictions using the equations or graphs of best□fit lines of scatter plots*

Stage 2 – Evidence	
NETS for Students	**PERFORMANCE TASK(S)—can include transfer tasks and Project-Based Learning**
NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world. *Critical Thinking* *Technology Operations*	*Examples include but are not limited to:* *Labs, open-ended essays, voice recordings, videos, presentations, discussion boards, graphic organizers, songs, skits, dioramas, visual projects (posters, dioramas)* List the task(s), then explain how the student will demonstrate the transfer of knowledge or skill involved in the task(s) (reference Stage 1, Item #4): *Activities with real life data that require creating different types of graphs* *Line of best fit to make predictions, helping students understand what the slope and y-intercept mean in real life* *Participate in an experiment to show the difference between experimental and theoretical probability*
	OTHER SUMMATIVE ASSESSMENTS—can include factual recall
	Examples include but are not limited to final projects, research papers, quizzes and tests. List the assessments: *Quizzes and Tests*

<table>
<tr><th colspan="3">Stage 3 – Learning Plan</th></tr>
<tr><th>NETS for Students</th><th colspan="2">Learning Activities</th><th>Progress Monitoring/Formative Assessment</th></tr>
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Critical Thinking
Technology Operations</td><td colspan="2">Questions to consider while planning:
● Are transfer and acquisition addressed in the learning plan?
● Does the learning plan reflect principles of learning and best practices?
● Is there tight alignment with Stages 1 and 2?
● Is the plan likely to be engaging and effective for all students?</td><td>● How will you monitor students' progress toward acquisition, meaning, and transfer during learning activities?
Daily assessments, teacher observation of students in class performance, teacher observation during peer share out sessions, notebook assessment
● What are potential rough spots and student misunderstandings?
Messing up the different types of graphs
When creating line of best-fit, trying to read the y-intercept off of the graph, when creating a line of best fit, choosing any two points to use to calculate the line instead of the ones that the line actually goes through
students mix up conditional probabilities
students get confused between experimental and theoretical probability
● How will students get the feedback they need?
Graded assessment, teacher observation immediate feedback, peer feedback, mid chapter quiz, notebook assessment</td></tr>
<tr><td>List planned activities
(examples include but are not limited to: experiments, guided reading, worksheets, discussions, note-taking, research, games):

Probability Activity: have students find the probability using real world data (skittles, cards, dice, coins, etc)

note-taking, worksheets, classwork, homework, Study Island</td><td>List resources required
(examples include but are not limited to: laptops, iPads, websites, digital cameras, magazines, Blackboard, textbooks, novels, primary source documents, other non-fiction text, lab equipment, maps, translator, calculators)

Textbook, laptops, whiteboard, graph paper white boards, document camera, calculators</td><td>FORMATIVE ASSESSMENTS—any non-graded, diagnostic assessment administered prior to or during a unit that reflects prior knowledge, skill levels, and potential misconceptions.

Examples include but are not limited to: Pre-tests, clickers (CPS), mini whiteboards, entrance and exit tickets, CDTs, DIBELS, Aimsweb

interactive whiteboard , Study Island, mini whiteboards, Kahoot, Xtramath</td></tr>
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