Saint Patrick High School

Curriculum Guide

Department:	Mathematics	Grade and Level:	Sophomores
Class:	Algebra 1 PX	Term (Semester or Year):	All Year

Required Text:	Pearson - Prentice Hall Foundations of Algebra 1
Additional Resources (i.e. texts, materials, apps, etc.):	iPad Apps Nearpod Showbie GoodReader Socrative GoogleDrive Other TI-83/84 Graphing Calculator Notebook and Looseleaf Paper Pencil

Course Description

This level of Algebra I is designed for sophomores students who have demonstrated a working knowledge of mathematics. The course covers traditional topics, including properties of real numbers, algebraic expressions, and linear and quadratic equations. Emphasis is given to problem solving and graphing. Students in this course over most of the same material as the College prep class but may take longer to master learning targets. (1 credit / Phoenix weight)

Learning Targets

Some learning targets are labeled as "optional". This is meant to imply that these targets are of a secondary nature and students must show mastery of the former targets to attempt the optional ones. Keep pacing of the unit in mind if you plan to incorporate these targets.

Units Cover by Chapters

Unit 1: Operations with Real Numbers	
Unit 2: Solving Equations	
Unit 3: Solving Inequalities	
Unit 4: Functions	
Unit 5: Linear Functions	
Unit 6: Systems of Linear Equations	
Unit 7: Exponents & Exponential Functions	
Unit 8: Polynomials & Factoring	
Unit 9: Quadratic Functions & Equations	
Unit 10: Radicals/Data Analysis/Probability	

Agreed Upon Assessments

Forms of assessments may include but are not limited to….
- Unit Tests
- Learning Target Quizzes

Unit:1	Operations with Real Numbers	**Duration:**	18 days instructional 1 day review 2 days assessment

Essential Questions:
- How can we simplify an expression?

Learning Targets:
Students will be able to…:
- Determine whether a statement is an expression or equation.
- Apply the order of operations to a given expression.
- Distinguish between the properties of real numbers (associative, commutative, Identity)
- Add or subtract any two real numbers.
- Multiply or divide any two real numbers.
- Distribute over a set of parentheses and simplify.
- Explain strategies for simplifying expressions based on apparent characteristics.

Academic Standards Addressed (CCSS):
- *A.SSE.1.a*
- N.RN.3
- A.CED.1
- A.CED.2

Common Assessments:
- 3 Learning Target Quizzes
- Chapter Test

Unit:2	Solving Equations	Duration:	20 days instructional 1 day review 2 days assessment

Essential Questions:
- How do we know which inverse operation to apply for a given equation?

Learning Targets:
Students will be able to…:
- Solve one-step equations by using inverse operations and properties of equality.
- Solve two-step equations by using inverse operations and properties of equality.
- Solve multi-step equations by using inverse operations and properties of equality.
- Solve equations with variables on both sides by using inverse operations and properties of equality.
- Write ratios to relate two quantities.
- Find unit rates
- Convert units and rates to different units using unit analysis.
- Solve proportions by using the cross-multiplication property.
- Solve for missing elements (percent, part, or whole) in a percent equation.

Academic Standards Addressed (CCSS):
- A.CED.1
- A.REI.3
- A.REI.1
- A.CED.4
- N.Q.1
- N.Q.2
- N.Q.3

Common Assessments:
- 3 Learning Target Quizzes
- Chapter Test

Unit:3	Solving Inequalities	Duration:	15 days instructional 1 day review 2 days assessment

Essential Questions:

- How do we know which inverse operations to apply for a given inequality?

Learning Targets:

Students will be able to…:

- Graph the solutions of inequalities.
- Solve one-step inequalities by using addition or subtraction.
- Solve one-step inequalities by using multiplication or division.
- Know when to change an inequality symbol if multiplying or dividing by a negative value.
- Solve multi-step inequalities.
- Solve compound inequalities
- Graph the solutions to compound inequalities
- Solve absolute value equations *(optional)*
- Solve absolute value inequalities *(optional)*
- Graph the solutions to absolute value inequalities.
- Write sets, identify subsets, and identify complements of sets *(optional)*
- Identify the unions and intersections of sets. *(optional)*

Academic Standards Addressed (CCSS):

- A.REI.1
- A.REI.3
- A.REI.11
- A.CED.1
- A.APR.1

Common Assessments:

- 3 Learning Target Quizzes
- Chapter Test

Unit:4	An Introduction to Functions	**Duration:**	12 days instructional 1 day review 2 days assessment

Essential Questions:
- What is a function and how can we represent it?
- What do I need to know to create a function rule?

Learning Targets:
Students will be able to…:
- Identify the four quadrants of the Cartesian Plane.
- Plot and record ordered pairs on the Cartesian Plane.
- take information from a data-table and graph the corresponding points.
- identify a linear functions and create a function rule for it.
- differentiate between linear and non-linear functions.
- create a graph given a function rule.
- create a function rule when given a description.
- analyze the domain and range and determine if the relation is a function.

Academic Standards Addressed (CCSS):
- A.F.IF.1
- A.F.IF.2
- A.F.IF.4
- A.F.BF.1
- A.F.LE.1

Common Assessments:
- 2 Learning Target Quizzes
- Chapter Test

Unit:5	Linear Functions	Duration:	16 days instructional 1 day review 2 days assessment

Essential Questions:
- What does the slope of a line indicate about the line?
- What information does the equation of a line give you?
- How can you make predictions based on a scatter plot?

Learning Targets:
Students will be able to…:
- Find rates of change from tables.
- Find and calculate slope given a graph.
- Calculate slopes given two points.
- Write and graph an equation of a direct variation. *(optional)*
- Write linear equations using slope-intercept form.
- Graph linear equation in slope-intercept form.
- Write and graph linear equations using point-slope form.
- To graph linear equations using intercepts.
- To write linear equations in standard form. **(optional)**
- To determine whether lines are parallel, perpendicular, or neither.
- To write equations of parallel lines and perpendicular lines. *(optional)*

Academic Standards Addressed (CCSS):
- 8.EE.5
- 8.EE.6
- 8.EE.7
- A.CED.1
- A.F.IF.7a
- A.F.LE.2

Common Assessments:
- 3 Learning Target Quizzes
- Chapter Test

Unit:6	Systems of Linear Equations and Inequalities	**Duration:**	12 days instructional 1 day review 2 days assessment

Essential Questions:
- What does the solution to a systems of equations represent?
- Which method would be best suited for solving a particular system of equations?

Learning Targets:
Students will be able to…:
- determine whether a point is a solution to a system of equations or inequalities.
- graph a system of equations to find the solution.
- apply the substitution method to solve a systems of equations.
- apply the elimination method to solve a systems of equations.
- model and solve a real-world application using a systems of equations. *(optional)*
- extend their knowledge of systems of equations to systems of inequalities.

Academic Standards Addressed (CCSS):
- 8.EE.8
- A.REI.6
- A.REI.12

Common Assessments:
- 2 Learning Target Quizzes
- Chapter Test

Unit:7	Exponents and Exponential Functions	Duration:	8 days instructional 1 day review 1 day assessment

Essential Questions:
- How can you represent numbers less than one using exponents?
- How can you simplify expressions involving exponents?

Learning Targets:
Students will be able to…:
- simplify expressions involving zero and negative exponents.
- multiply powers with the same base.
- raise a power to a power.
- raise a product to a power.
- divide powers with the same base.
- raise a quotient to a power.

Academic Standards Addressed (CCSS):
- 8.EE.1
- A.N.RN.1
- A.N.RN.2

Common Assessments:
- Two Learning Target Quizzes
- Chapter Test

Unit:8	Polynomials and Factoring	Duration:	16 days instructional 1 day review 2 days assessment

Essential Questions:
- Can two algebraic expressions that appear to be different be equivalent?
- How are the properties of real numbers related to polynomials.

Learning Targets:
Students will be able to…:
- Classify, add, and subtract polynomials.
- Multiply a monomial by a polynomial.
- Factor a monomial from a polynomial.
- Multiply two binomials or a binomial by a trinomial.
- Find the square of a binomial and to find the product of a sum and difference.
- Factor trinomials of the form $x^2 + bx + c$
- Factor trinomials of the form $ax^2 + bx + c$
- Factor perfect-square trinomials and the differences of two squares.
- Factor by grouping. *(optional)*

Academic Standards Addressed (CCSS):
- A.APR.1
- A.APR.2
- A.APR.3

Common Assessments:
- 3 Learning Target Quizzes
- Chapter Test

Unit:9	Quadratic Functions and Equations	Duration:	12 days instructional 1 day review 2 days assessments

Essential Questions:
- What are the defining features of a quadratic equation?
- How can we solve a quadratic equation?

Learning Targets:
Students will be able to…:
- explain how the parameters a and c affect the graph of $y = ax^2 + c$.
- graph a parabola in standard form.
- find the vertex and axis of symmetry of a parabola in standard form.
- identify the solutions or a quadratic equation on a graph.
- solve a quadratic equation by factoring the polynomial.
- perform the quadratic formula to solve a quadratic equation.

Academic Standards Addressed (CCSS):
- A.SSE.3
- A.REI.4
- A.F.IF.7

Common Assessments:
- 2 Learning Target Quizzes
- Chapter Test

Unit:10	Radicals/Data Analysis/Probability	**Duration:**	8 days instructional 1 day review 2 days assessment

Essential Questions:
- How are radicals simplified?
- How can collecting and analyzing data help you make decisions or predictions.
- How can you make and interpret different representations of data?
- How is probability related to real-world events?

Learning Targets:
Students will be able to…:
- Simplify radicals involving products and quotients.
- Find mean, median, mode, and range.
- To find theoretical and experimental probabilities.
- To find probabilities of mutually exclusive and overlapping events.
- To find probabilities of independent and dependent events.

Academic Standards Addressed (CCSS):
- 8.EE.2
- A.S.ID.2
- A.S.CP.1
- A.S.CP.2
- A.S.CP.5
- A.S.CP.6
- A.S.CP.7

Common Assessments:
- One Learning Target Quiz
- Chapter Test

Appendix

CCSS Resources
Common Core Website: http://www.corestandards.org/read-the-standards/
Common Core App:

Essential Questions
Essential Questions help structure and plan an academic unit. For information regarding developing Essential Questions, please refer to the file shared with you on Google Drive.

Action Verbs
Examples of Action Verbs:
Discuss, recall, state, measure, identify, collect, create, hypothesize, analyze, identify, define, describe