07_Systems of Equations and Inequalities

Content Area: **Math**
Course(s):
Time Period: **Full Year**
Length: **2-3 weeks (7-10 blocks)**
Status: **Published**

General Overview, Course Description or Course Philosophy

This unit will focus on strengthening the prerequisite skills and conceptual understanding needed to solve systems of equations and inequalities. Lesson activities will reinforce new content and address common misconceptions and errors to support students' progress toward solving systems of equations and inequalities.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Objectives/Enduring Understandings:

Students will understand that:

- Graphs of systems can be used to represent a real-world situation, solve a problem or predict an outcome
- Systems of equations can be solved using various methods: visually by graphing and algebraically by substitution or elimination
- The intersection of the graphs of a pair of linear equations is used to estimate the solution to the system
- The solution to systems of inequalities is the overlapping shaded region from the graph of two inequalities on the same coordinate plane

Essential Questions:

- How do you use systems of linear equations and inequalities to model situations and solve problems?
- How does the graph of a system of linear inequalities related to the solutions of the system of inequalities?

CONTENT AREA STANDARDS

MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.7	Look for and make use of structure.
MA.A-REI.C.5	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.

MA.A-REI.C.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
MA.A-REI.C.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.
MA.A-REI.D.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
MA.A-REI.D.12	Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
WRK.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
WRK.K-12.P.9	Work productively in teams while using cultural/global competence.

STUDENT LEARNING TARGETS

Declarative Knowledge

Students will understand that:

- A system of linear equations can have no solution, one solution, or inifinite solutions
- The overlapping shaded region from both linear inequality graphs determines the solution for the system of linear inequalities
- A simple system (between a linear equation and a quadratic in two variables) can have no solution, one solution, or two solutions

Procedural Knowledge

Students will be able to:

- Find exact solutions for systems of linear equations using a variety of methods (graphing, substitution, elimination)
- Find approximate solutions for systems of linear equations using graphs
- Graph a system of linear inequalities
- Determine appropriate points to test to develop the solution set for a system of linear inequalities
- Find the solution set for a simple system consisting of a linear equation and a quadratic in two variables algebraically and graphically

- Verify whether a point is or is not a solution to an equation of two variables

EVIDENCE OF LEARNING

Formative Assessments
- Student daily participation
- Student self-assessment
- Skills checklist
- Student-friendly proficiency scales
- Teacher feedback

Summative Assessments
- Assessment Reflection

RESOURCES (Instructional, Supplemental, Intervention Materials)

- Kuta Software
- Quizizz
- Desmos
- Delta Math
- Nearpod
- Khan Academy
- Assessment Reflection

INTERDISCIPLINARY CONNECTIONS
- The graphs and solution sets of systems of equations and inequalities can be used to

model and interpret real-world situations in a variety of contexts

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.