



## Marietta City Schools

### District Unit Planner

Everything on the unit planner must be included on the unit curriculum approval statement.

#### Grade 8 Honors Mathematics

|            |  |          |   |                     |                           |
|------------|--|----------|---|---------------------|---------------------------|
| Unit title | Unit 4: Real-Life Phenomena Explored Through Systems of Linear Equations | MYP year | 3 | Unit duration (hrs) | MMS- (4.5 hours per week) |
|------------|--|----------|---|---------------------|---------------------------|

Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): *What will students learn?*

#### Georgia K-12 Standards

##### Standards

**8.FGR.7** Justify and use various strategies to solve systems of linear equations to model and explain real-life phenomena.

##### ***8.FGR.7: Justify and use various strategies to solve systems of linear equations to model and explain realistic phenomena.***

| Expectations |  | Evidence of Student Learning<br>(not all inclusive; see Grade Level Overview for more details)  |  |
|--------------|--|---|--|
|              |  | Strategies and Methods  | Examples   |
| 8.FGR.7.1    | Interpret and solve relevant mathematical problems leading to two linear equations in two variables.   | <ul style="list-style-type: none"><li>Students should have a variety of opportunities to explore problems using technology and tools in order to strengthen their conceptual understanding of systems of linear equations as they visually analyze what happens when the variables are manipulated in the problem.</li></ul>  | <ul style="list-style-type: none"><li>A trampoline park that you frequently go to is \$9 per visit. You have the option to purchase a monthly membership for \$30 and then pay \$4 for each visit. Explain whether you will buy the membership, and why.<br/><br/>Option A: <math>y = \\$9x</math><br/>Option B: <math>y = \\$30 + \\$4x</math></li><li>Anya is traveling from out of town. This is the only time she will visit this trampoline park. Which option should she choose?</li><li>Jin plans on going to the trampoline park seven times this month. Which option should he choose? What does the point of intersection of the graphs represent?</li></ul> |
| 8.FGR.7.2    | Show and explain that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because the points of | <b>Strategies and Methods</b> <ul style="list-style-type: none"><li>Students should be provided with opportunities to explore systems of equations represented on interactive graphs to analyze and interpret the solutions to the systems.</li><li>Students should be able to analyze and explain solutions to systems of equations presented numerically, algebraically, and graphically.</li></ul> |  |

|           |   |  |   |  |  |
|-----------|---|--|---|--|--|
|           | intersection satisfy both equations simultaneously.   |  |   |  |  |
| 8.FGR.7.3 | Approximate solutions of two linear equations in two variables by graphing the equations and solving simple cases by inspection.                          | <b>Strategies and Methods</b> <ul style="list-style-type: none"> <li>Students should be provided with opportunities to explore systems of equations represented on interactive graphs to analyze and interpret the solutions to the systems.</li> <li>Students should have opportunities to analyze and explore problems using technology and tools to strengthen their conceptual understanding of systems of linear equations.</li> </ul>  | <b>Example</b> <ul style="list-style-type: none"> <li>A student can graph two linear equations that represent a culturally relevant problem using digital graphing tools (i.e., Desmos) and visually make sense of the graphed lines based on a given context. A student can provide a verbal or written explanation of their reasoning.</li> </ul> |  |  |
| 8.FGR.7.4 | Analyze and solve systems of two linear equations in two variables algebraically to find exact solutions.   | <b>Strategies and Methods</b> <ul style="list-style-type: none"> <li>Students should be able to analyze and solve pairs of simultaneous linear equations (systems of linear equations) within realistic situations and an expressed phenomenon.</li> <li>Students should validate their graphical approximations using algebraic strategies.</li> <li>Students should use substitution and elimination to solve systems of linear equations.</li> </ul>  | <b>Example</b> <ul style="list-style-type: none"> <li>Given coordinates for two pairs of points, a student can determine whether the line through the first pair of points intersects the line through the second pair.</li> </ul>  |  |  |
| 8.FGR.7.5 | Create and compare the equations of two lines that are either parallel to each other, perpendicular to each other, or neither parallel nor perpendicular. | <b>Strategies and Methods</b> <ul style="list-style-type: none"> <li>Students should have the opportunity to explore visual graphs of equations that are parallel, perpendicular or neither parallel nor perpendicular to develop a deep, conceptual understanding.</li> <li>As students are comparing parallelism and perpendicularity of lines, they should see the connection as a system of equations.</li> <li>Students should be able to explain if systems are consistent or inconsistent.</li> </ul> | <b>Example</b> <ul style="list-style-type: none"> <li>A student can recognize that there is no solution to the system of equations formed by <math>3x + 2y = 5</math> and <math>3x + 2y = 6</math> because the lines are parallel and <math>3x + 2y</math> cannot simultaneously be 5 and 6.</li> </ul>   |  |  |

**8.MP:** Display perseverance and patience in problem-solving. Demonstrate skills and strategies needed to succeed in mathematics, including critical thinking, reasoning, and effective collaboration and expression. Seek help and apply feedback. Set and monitor goals.

**Concepts/Skills to support mastery of standards**

- 8.FGR.7.1- Interpret and Solve two linear equations with two variables
- 8.FGR.7.2- Explain solutions for Systems of Equations (Point of Intersections)
- 8.FGR.7.3- Graphing Systems of Equations (Approximate Solution Point)
- 8.FGR.7.4- Algebraically solve Systems of Equations (Exact Solution)
- 8.FGR.7.5- Create and Compare Parallel and Perpendicular Lines

**Vocabulary**

[K-12 Mathematics Glossary](#)

|                      |                       |              |             |                           |                 |
|----------------------|-----------------------|--------------|-------------|---------------------------|-----------------|
| Systems of Equations | Point of Intersection | One Solution | No Solution | Infinitely Many Solutions | Slope Intercept |
|----------------------|-----------------------|--------------|-------------|---------------------------|-----------------|

|   |   |                      |                                |   |                     |
|---|---|----------------------|--------------------------------|---|---------------------|
| Standard Form   | Substitution Method   | Elimination Method   | Graphing of 2 Linear Functions | Parallel Lines                                      | Perpendicular Lines |
| <b><u>Notation</u></b><br>Y = mx + b  |   |                      |                                |   |                     |
| Key concept   |   | Related concept(s)   |                                | Global context                                      |                     |
| Logic   |   | Justification System |                                | Scientific and Technical Innovation                 |                     |
| Statement of inquiry  |   |                      |                                |   |                     |
| Analyzing systems helps us make logical decisions.  |   |                      |                                |   |                     |
| Inquiry questions   |   |                      |                                |   |                     |
| Factual— What is the method for solving systems of equations? What is the solution to a system? |   |                      |                                |   |                     |
| Conceptual— How can results of a system of equations be interpreted?                            |   |                      |                                |   |                     |
| Debatable- What would be the best way to solve a system of equations?                           |   |                      |                                |   |                     |
| MYP Objectives  | Assessment Tasks  |                      |                                |   |                     |
| What specific MYP <b><u>objectives</u></b> will be addressed during this unit?                  | Relationship between summative assessment task(s) and statement of inquiry: |                      |                                | List of common formative and summative assessments. |                     |

|  |   |  |
|--|---|--|
| <p>Criterion A: Knowledge and Understanding</p> <p>Criterion D: Applying Mathematics in Real Life Context.</p>   | <p>Students can analyze systems in order to make logical decisions.</p> | <p><b><u>Formative Assessment(s):</u></b></p> <p><b><u>Unit 4 CFA</u></b></p> <p><b><u>Summative Assessment(s):</u></b></p> <p><b><u>Unit 4 Summative</u></b></p> <p><b><u>MYP Project:</u></b></p> <p><b><u>Savvas Topic 5 Performance Task B</u></b></p> |
| <p><b>Approaches to learning (ATL)</b></p>   |   |  |
| <p><b>Category:</b> Communication Skills</p> <p><b>Cluster:</b> Communication</p> <p><b>Skill Indicator:</b> Exchanging thoughts, messages and information effectively through interaction</p> |   |  |

| <p style="text-align: center;"><b><u>Learning Experiences</u></b></p> <p style="text-align: center;">Add additional rows below as needed.</p>   |  |  |
|---|--|--|
| Objective or Content  | Learning Experiences   | Personalized Learning and Differentiation  |
| <p><b>8.FGR.7</b> Justify and use various strategies to solve systems of linear equations to model and explain real-life phenomena.</p> <ul style="list-style-type: none"> <li>8.FGR.7.1- Interpret and Solve two linear equations with two variables</li> <li>8.FGR.7.2- Explain solutions for Systems of Equations (Point of Intersections)</li> <li>8.FGR.7.3- Graphing Systems of Equations (Approximate Solution Point)</li> </ul> | <p>Baseball Jerseys Project Resources</p> <p><a href="https://lor2.gadoe.org/gadoe/file/ac355ed7-6ace-4028-9180-8e1ff8b1d9e5/1/Baseball-Jerseys-Projected-Resources.pdf">https://lor2.gadoe.org/gadoe/file/ac355ed7-6ace-4028-9180-8e1ff8b1d9e5/1/Baseball-Jerseys-Projected-Resources.pdf</a><br/>(student resource)</p> <p><a href="https://lor2.gadoe.org/gadoe/file/ac355ed7-6ace-4028-9180-8e1ff8b1d9e5/1/Baseball-Jerseys.pdf">https://lor2.gadoe.org/gadoe/file/ac355ed7-6ace-4028-9180-8e1ff8b1d9e5/1/Baseball-Jerseys.pdf</a><br/>(Teacher's Guide)</p>   | <p>In this learning plan, students will be given a scenario where students must analyze options for making t-shirts. Students will create and solve a system of linear equations. Teachers will be able to assess how well students are able to interpret a situation and represent the variables mathematically, select appropriate mathematical methods to use, and explore the effects of systematically varying the constraints.</p>   |
| <p><b>8.FGR.7</b> Justify and use various strategies to solve systems of linear equations to model and explain real-life phenomena.</p> <ul style="list-style-type: none"> <li>8.FGR.7.1- Interpret and Solve two linear equations with two variables</li> <li>8.FGR.7.4- Algebraically solve Systems of Equations (Exact Solution)</li> </ul>  | <p>Fun-with-Tape-Diagrams</p> <p><a href="https://lor2.gadoe.org/gadoe/file/11b94812-fdb2-46be-b119-82a74d360485/1/Fun-with-Tape-Diagrams-Student-Reproducibles-Grade-8-Unit-4.pdf">https://lor2.gadoe.org/gadoe/file/11b94812-fdb2-46be-b119-82a74d360485/1/Fun-with-Tape-Diagrams-Student-Reproducibles-Grade-8-Unit-4.pdf</a><br/>(student resource)</p> <p><a href="https://lor2.gadoe.org/gadoe/file/11b94812-fdb2-46be-b119-82a74d360485/1/Fun-with-Tape-Diagrams.pdf">https://lor2.gadoe.org/gadoe/file/11b94812-fdb2-46be-b119-82a74d360485/1/Fun-with-Tape-Diagrams.pdf</a><br/>(Teacher's Guide)</p>                                     | <p>In this learning plan, students will explore another way to solve systems of equations through the use of diagrams. Students will be given the opportunity to reason logically with systems of equations to “eliminate” common components and find a solution.</p>  |
| <p><b>8.FGR.7</b> Justify and use various strategies to solve systems of linear equations to model and explain real-life phenomena.</p> <ul style="list-style-type: none"> <li>8.FGR.7.3- Graphing Systems of Equations (Approximate Solution Point)</li> <li>8.FGR.7.5- Create and Compare Parallel and Perpendicular Lines</li> </ul>   | <p>Parallel and Perpendicular Lines</p> <p><a href="https://lor2.gadoe.org/gadoe/file/6ad5864d-a3ba-4873-9133-90792916d9dd/1/Parallel-and-Perpendicular-Lines-FAL-Student-Reproducibles.pdf">https://lor2.gadoe.org/gadoe/file/6ad5864d-a3ba-4873-9133-90792916d9dd/1/Parallel-and-Perpendicular-Lines-FAL-Student-Reproducibles.pdf</a><br/>(Student Resource)</p> <p><a href="https://lor2.gadoe.org/gadoe/file/6ad5864d-a3ba-4873-9133-90792916d9dd/1/Parallel-and-Perpendicular-Lines-FAL.pdf">https://lor2.gadoe.org/gadoe/file/6ad5864d-a3ba-4873-9133-90792916d9dd/1/Parallel-and-Perpendicular-Lines-FAL.pdf</a><br/>(Teacher's Guide)</p> | <p>This learning plan is intended to help you assess how well students understand the relationship between the slopes of parallel and perpendicular lines and in particular and to help identify students who find it difficult to find, from their equations, lines that are parallel and perpendicular and identify and use intercepts. It also aims to encourage discussion on some common misconceptions about equations of lines.</p> |

| Content Resources                          |
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| Georgia DOE Frameworks<br>enVisionmath 2.0 |