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ST. JOSEPH

SCHOOL DISTRICT

*Math Modeling and Reasoning I Curriculum

Unit 0	Unit 1	Unit 2	Unit 3
Prerequisites	Equations and Graphs	Functions	Polynomial and Rational Functions
4 weeks	4 weeks	4 weeks	4 weeks

Course MLS Learning Intentions

We are learning to be mathematicians…

- We create, apply, and use mathematical models to solve problems.
- We draw conclusions and make decisions using proportional reasoning.
- We learn how functions and their graphs can be used to solve many real-world applications.

Course SMP Learning Intentions

We are learning to be mathematicians…

- We communicate our ideas using precise math language.
- We make mistakes and persevere in solving problems.
- We find patterns and make connections.
- We model and show our thinking in multiple ways.
- We use tools and practice to improve understanding.

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Unit 0: Prerequisites (3 weeks)

Learning Intention

We are learning to make and use algebraic models.

Success Criteria

- I can use real number properties to model and solve problems.
- I can write and use algebraic expressions to model and solve problems.
- I can use ratios, proportions, rates, and percentages to explain, draw conclusions, or make decisions.
- I can make and use models to solve problems.
- I can use units and unit conversion to explain, draw conclusions, or make decisions.

Learning Standards

ACT Alignment: N 603. Apply number properties involving positive/negative numbers

ACT Alignment: AF 402. Perform straightforward word-to-symbol translations

ACT Alignment: A 402. Add and subtract simple algebraic expressions

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Unit 1: Equations and Graphs (3 weeks)

Learning Intention

We are learning to use equations and graphs to model situations, solve problems, and make predictions.

Success Criteria

- I can graph equations with two variables.
- I can create and use a linear equation to model situations and solve problems.
- I can create and solve inequalities.
- I can use technology to find a line of best fit and use it to make predictions.

Learning Standards

ACT Alignment: A 405. Match simple inequalities with their graphs on the number line.

ACT Alignment: A 406. Exhibit knowledge of slope.

ACT Alignment: AF 503. Match linear equations with their graphs in the coordinate plane.

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Unit 2: Functions (3 weeks)

Learning Intention

We are learning to use functions to model situations and solve problems.

Success Criteria

- I can collect and organize data in graphs and tables.
- I can describe and contrast linear and non-linear rates of change.
- I can transform functions.
- I can use a function to model situations and make predictions.

Learning Standards

ACT Alignment: F 401. Evaluate linear and quadratic functions, expressed in function notation, at integer values.

ACT Alignment: F 504. Attend to the difference between a function modeling a situation and the reality of the situation.

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Unit 3: Polynomial and Rational Functions (3 weeks)

Learning Intention

We are learning to use polynomial and rational functions to model situations and solve problems.

Success Criteria

- I can graph quadratic functions and use them to model situations and solve problems.
- I can graph polynomial functions and use them to model situations and solve problems.
- I can graph rational functions and use them to model situations and solve problems.

Learning Standards

ACT Alignment: F 501. Evaluate polynomial functions, expressed in function notation, at integer values.

ACT Alignment: F 510. Find where a rational function's graph has a vertical asymptote