EAGLE MOUNTAIN SAGINAW ISD
Curriculum and Instruction

Advanced Quantitative Reasoning Parent Guide

1st Six Weeks

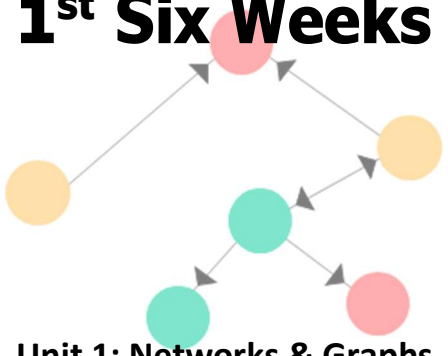
Unit 1 Concepts:

This unit focuses on the creation of models that represent real-world contexts involving networks & graphs & using these networks & graphs to investigate real world scheduling problems.

Learning Goals:

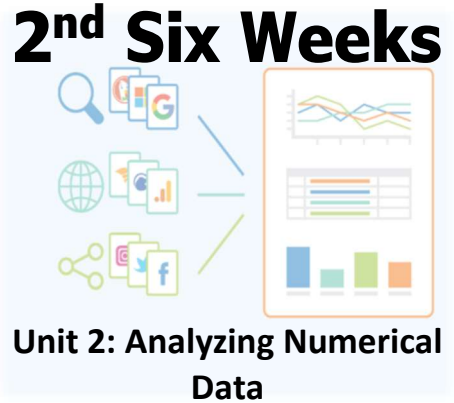
Students will use graphs, circuits and paths to study Euler and Hamiltonian Circuits. They will represent situations using graphs and use algorithms to find minimal spanning trees. Students will create coloring maps and their associated graphs, then analyze and construct activity graphs to help make predictions about the time it would take to complete a task.

Why? – We create models that represent real-world contexts involving networks and graphs to investigate real-world scheduling problems.



Unit 1: Networks & Graphs

2nd Six Weeks



Unit 2: Analyzing Numerical Data

Unit 2 Concepts:

This unit focuses on deepening students' understanding of proportional reasoning & basic numerical calculations - such as rations, rates, & percent - by applying them to settings in business, media, consumer & other areas.

Learning Goals:

Students will use proportions and the fundamental counting principal to estimate large numbers. They will use proportional reasoning to solve problems involving ratios, such as changing tires or selecting a new television. They will calculate weighted sums and averages along with understanding how credit card numbers are derived.

Why? – Proportional reasoning and basic numerical calculations – such as ratios, rates, and percent – can be applied to settings in business, media, and many other areas of life. We learn in depth how to analyze information in order to make decisions in everyday situations.

3rd Six Weeks

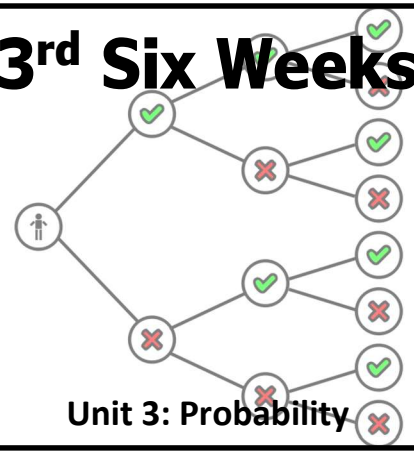
Unit 3 Concepts:

This unit focuses on the analysis of information using probability to make decisions about everyday situations.

Learning Goals:

Students will analyze and construct representations of events, including tree diagrams, Venn diagrams, and area models to determine probabilities and risk. They will explore the use of probabilities in situations like playing cards, computer games, or selecting classes. They will use these probabilities to calculate expected outcomes and payoffs for a variety of situations. Lastly, they will apply these skills to determine mathematical fairness.

Why? – We use probability to analyze information and make decisions about risks and mathematical fairness. In real-life, scenarios will include those in which outcomes are not always equally likely, and the tools we learn help us weight the different possibilities in such situations.



Unit 3: Probability

Unit 4 Concepts:

This unit focuses on developing background statistical knowledge through the use of existing case studies & introducing students to the basic components of the design & implementation of statistical studies. After collecting and displaying data, students explore introductory techniques of statistical analysis.

Learning Goals:

Students will review the parts of the research cycle and the types of studies that exist. They will learn about treatments, variables of interest, and various sampling designs. Students will interpret a variety of graphical displays and learn when to use them successfully and then review the concept of bias and its effect on studies.

Why? – In this unit, students are empowered to become more discerning consumers of the statistics in everyday situations.

4th Six Weeks

Unit 4: Statistical Studies

5th Six Weeks

Unit 5: Using Recursion & Functions in Models & Decision Making

Unit 5 Concepts:

Students will analyze and find rules to model data. This unit builds on students' knowledge of linear and exponential functions and focuses on recursive rules that model data exhibiting exponential and linear patterns.

Learning Goals:

In this unit students will dig deeper into their understanding of graphical displays by analyzing the form, direction, and strength of scatterplots. They will identify if the data models a linear or exponential pattern and find both explicit and recursive rules to model the data. Lastly, they will learn about new functions including logistical, cyclical, piecewise, and step functions.

Why? – Students will work with rules in business and natural contexts where they need to create models for a variety of real-world situations.

Unit 6 Concepts:

Unit 6 focuses on the financial decisions that surround borrowing, loaning, and investing money and how the time value of money affects such decisions.

Learning Goals:

Students will analyze income opportunities involving salary, type of employment, taxes, benefits, and financial goals. They will research and calculate the cost of living and how that effects a budget. They will learn about the future value of an investment to help plan for retirement and look at the effects of debt over time.

Why? – Students will learn to make good financial decisions that surround borrowing, loaning, and investing money along with financial tools to help them plan wisely and use credit knowledgeably. These contexts provide rich opportunities for critical thinking and problem solving.

6th Six Weeks

Unit 6: Decision Making in Finance

Questions? Please contact your AQR math teacher. **Additional Support:** We recommend Khan Academy and Tutor.com and remember campus tutoring is also available.