College Math Pacing Guide

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| Unit | Time Frame | Activities | Assessments | Standard/ Objective |
| Unit 1: Problem Solving   * 1.1 Solving Problems by Inductive Reasoning * 1.2 Application of Inductive Reasoning: Number Patterns * 1.3 Strategies for Problem Solving | Two weeks  August to September (tentative schedule) | * Students will take guided notes for the chapter. These can sometimes be used on assessments to add to their worth. * Students will complete Exercises to practice the learned skills (10 points each) | * Students will take a test over the chapter (40 points) | Objectives:   * Use inductive reasoning to solve problems * Discover and apply different problem solving strategies for all types of real world problems |
| Unit 2: The Basic Concepts of Set Theory   * 2.1 Symbols and Terminology * 2.2 Venn Diagrams and Subsets * 2.3 Set Operations and Cartesian Products * 2.4 Cardinal Numbers and Surveys | Two weeks  September | * Students will take guided notes for the chapter. These can sometimes be used on assessments to add to their worth. * Students will complete Exercises to practice the learned skills (10 points each | * Students will take a test over the chapter (40 points) | Objectives:   * Apply the basic terminology and symbols of set theory * Use Venn Diagrams to organize sets and their subsets * Use set operations * Find Cardinal numbers of sets |
| Unit 4: Numeration and Mathematical Systems  4.1 Historical Numeration Systems  4.2 Arithmetic in Hindu-Arabic System  4.3 Conversion Between Number Bases  4.4 Finite Mathematical Systems  4.5 Groups | Four weeks  September to November  (tentative schedule) | * Students will take guided notes for the chapter. These can sometimes be used on assessments to add to their worth. * Students will complete Exercises to practice the learned skills (10 points each | * Students will choose an ancient numerical system and research it. They will make a presentation to the class on their findings and show how it worked. (100 points) * Students will take a test over the chapter (around 40 points) | Objectives:   * Explore Historical Numeration Systems and apply them. * Explore the Hindu-Arabic Number system, its beginnings and basic properties * Convert numbers between number bases * Use the properties of finite sets * Use mathematical groups |
| Unit 5: Number Theory   * 5.1 Prime and Composite Numbers * 5.2 Selected Topics from Number Theory * 5.3 Greatest Common Factor and Least Common Multiple * 5.4 Clock Arithmetic and Modular Systems * 5.5 The Fibonacci Sequence and the Golden Rule | Four weeks  November to December  (tentative schedule) | * Students will take guided notes for the chapter. These can sometimes be used on assessments to add to their worth. * Students will complete Exercises to practice the learned skills (10 points each) * Students will look up the Fibonacci Sequence and the Golden Rule and give a brief explanation of each; Then find real life examples of The Fibonacci Sequence and the Golden rule. | * Students will choose a famous mathematician to research. They will make a presentation to the class. (100 points) * Students will take a test over the chapter. (around 40 points) | * Discover Properties of Prime and Composite Numbers * Use Divisibility Tables and rules * Use Selected topics in Number theory such as the Fibonacci Sequence and Fermat’s Last Theorem. * Find the GCF and LCF of huge numbers * Use Modular Arithmetic and Binary Code * Explore how the Golden rule and the Fibonacci Sequence occur naturally, or are used in the world. |
| Unit 6: The Real Numbers and Their Representations   * 6.1 Real Numbers, Order and Absolute Value * 6.2 Operations, Properties and Applications of Real Numbers * 6.3 Rational Numbers and Decimal Representations * 6.4 Irrational Numbers and Decimal Representations * 6.5 Applications of Decimals and Percents | Three Weeks  January  (tentative schedule) | * Students will take guided notes for the chapter. These can sometimes be used on assessments to add to their worth. * Students will complete Exercises to practice the learned skills (10 points each | * Students will take a quiz over Real Numbers and Rational Numbers (30 points) * Students will take a test over Real numbers and their representations (50 points) | |  |  | | --- | --- | | **Domain** | ***The Real Number System*** | | ***Cluster*** | ***Extend the properties of exponents to rational exponents*** | | **Standards** | 1. Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.  2. Rewrite expressions involving radicals and rational exponents using the properties of exponents. | |
| Unit 7: The Basic Concepts of Algebra   * 7.1 Linear Equations * 7.2 Applications of Linear Equations * 7.3 Ratio, Proportion, and Variation * 7.4 Linear Inequalities * 7.5 Properties of Exponents and Scientific Notation * 7.6 Polynomials and Factoring * 7.7 Quadratic Equations and Applications | Four Weeks  February to March (tentative schedule) | * Students will take guided notes for the chapter. These can sometimes be used on assessments to add to their worth. * Students will complete Exercises to practice the learned skills (10 points each | * Students will do a Collage of mathematics for a project. They must make it out of famous mathematicians, or any other math items they can picture. They must explain at least 15 items from their board. (100 points) * Students will take a test over the chapter (50-60 points) | |  |  | | --- | --- | | **Domain** | **Cluster** | | **Seeing Structure in Expressions** | Interpret the structure of expressions  Write expressions in equivalent forms to solve problems. |  |  |  | | --- | --- | | **Arithmetic with Polynomials and Rational Expressions** | Perform arithmetic operations on polynomials.  Understand the relationship between zeros and factors of polynomials. |  |  |  | | --- | --- | | **Reasoning with Equations and Inequalities** | Understand solving equations as a process of reasoning and explain the reasoning.  Solve equations and inequalities in one variable.  Solve systems of equations.  Represent and solve equations and inequalities graphically. | |
| Unit 8: Graphs, Functions, and Systems of Equations   * 8.1 The Rectangular Coordinate System and Circles * 8.2 Lines and Slopes * 8.3 Equations of Lines and Linear Models * 8.4 An Introduction to Functions: Linear Functions, Applications, and Models * 8.5 Quadratic Functions, Applications and Models * 8.6 Exponential and Logarithmic Functions, Applications and Models * 8.7 Systems of Equations and Applications * 8.8 Linear Inequalities, Systems, and Linear Programming | Three weeks March | * Students will take guided notes for the chapter. These can sometimes be used on assessments to add to their worth. * Students will complete Exercises to practice the learned skills (10 points each | * Students will take a quiz over the first four sections of the chapter. (30-40 points) * Students will take a test over the chapter (50-60 points) | |  |  | | --- | --- | | Domain | Cluster | | Interpreting Functions | Understand the concept of a function and use function notation.  Interpret functions that arise in applications in terms of the context. |  |  |  | | --- | --- | | Linear, Quadratic, and Exponential Models | Construct and compare linear, quadratic, and exponential models and solve problems. | |
| Unit 9: Geometry   * 9.1 Points, Lines, Planes, and Angles * 9.2 Curves, Polygons, and Circles * 9.3 Perimeter, Area, and Circumference * 9.4 The Geometry of Triangles: Congruence, Similarity, and the Pythagorean Theorem * 9.5 Space Figures, Volume and Surface Area * 9.6 Transformational Geometry * Non-Euclidean Geometry, Topology and Networks * 9.7 Chaos And Fractal Geometry | Three weeks  April  (tentative Schedule) | * Students will take guided notes for the chapter. These can sometimes be used on assessments to add to their worth. * Students will complete Exercises to practice the learned skills (10 points each) * Students will look up Fractals. They will try to create one using cardboard and glue. | * Students will take a quiz over the first four sections of the unit. (30-40 points) * Students will take a test over the unit. (50-60 points) | |  |  | | --- | --- | | Domain | Cluster | | **Congruence** | Experiment with transformations in the plane  Understand congruence in terms of rigid motions |  |  |  | | --- | --- | | **Similarity, Right Triangles, and Trigonometry** | Understand similarity in terms of similarity transformations |  |  |  | | --- | --- | | **Circles** | Understand and apply theorems about circles. |  |  |  | | --- | --- | | **Geometric Measurement and Dimension** | Explain volume formulas and use them to solve problems. | |
| Unit 10 Trigonometry   * 10.1 Angles and their measures * 10.2 Trigonometric Functions and Angles * 10.3 Trigonometric Identities * 10.4 Right Triangles and Function Values * 10.5 Applications of Right Triangles * 10.6 The Laws of Sines and Cosines; Area Formulas * 10.7 The Unit Circle and Graphs | Four Weeks April to May  (tentative schedule) | * Students will take guided notes for the chapter. These can sometimes be used on assessments to add to their worth. * Students will complete Exercises to practice the learned skills (10 points each | * Students will research an important topic or Person in Mathematics. They will present this to the class in a creative way of their choice. (song, movie, story book, or other approved option of their choice)(100 points) * Students will take a Test over the unit (50-60 points) | Domain:   |  | | --- | | **Similarity, Right Triangles, and Trigonometry** |   Cluster:   |  | | --- | | ***Apply trigonometry to general triangles*** | |