

MAT1000_202338_Staging_EMBR_TEM

MAT-1000

2023 05/01/2023 to 04/30/2024 Modified 03/22/2023

Course Description

This year-long course combines the skills of algebraic thinking with the abstract concepts of plane geometry to give a good foundation in mathematical logical thinking and the skills needed to develop sequential proofs. Students will explore and practice inductive and deductive reasoning, the Pythagorean Theorem, properties and principles related to polygons, and a more detailed look at trigonometric ratios. Students will have access to engaging multimedia video lectures, notes pages for each lesson summarizing the video content, practice problems, and assessments.

Rationale

Geometry is a very abstract yet practical study of theoretical and applicable mathematical principles and properties. It includes logic and reasoning, proofs and theorems, and applications for daily living and work. Geometry is based on ideas that deal with spatial relationships that can be used to solve real-life problems by implementing proven angle theorems and equations.

Course Learning Outcomes

- A. The student will explore properties of the coordinate plane and use inductive and deductive reasoning to solve mathematical proofs and problems.
- B. The student will discover the properties of linear equations and the relationship of the slope to parallel and perpendicular lines while considering the y-intercept form.
- C. The student will use given properties and logical reasoning in order to prove triangle congruence and coordinate point calculations.
- D. The student will manipulate the properties of triangles and proven theorems in order to solve for unknown values.
- E. The student will investigate principles that distinguish special quadrilaterals and related computations.
- F. The student will explore trigonometric functions and similarity of triangles and other geometric shapes.
- G. The student will use given formulas for calculating perimeter, area of geometric shapes, and geometric probability.
- H. The student will calculate the surface area and volume of three-dimensional figures given the corresponding formulas.
- I. The student will investigate the properties and calculations associated with circles and transformations across the coordinate plane.
- J. The student will observe patterns existing in geometric functions and use established rules to solve for unknowns.

Course Resources

See Ember's [Systems Requirements](#) for computer specifications necessary to operate this curriculum.

- Note: Embedded YouTube videos may be utilized to supplement Ember's YouTube videos are the property of the respective content creator, licensed to YouTube for distribution and user access. As a non-profit educational institution, Ember is able to use YouTube video content under the YouTube Terms of Service. For additional information on copyright, please contact the [Jerry](#)

* Course Policies

Types of Assessments

To simplify and clearly identify which policies apply to which assessment, each assessment has been categorized into one of four categories: Lesson, Assignment, Quiz, or Test. Each applicable item on the course Modules page has been designated with an identifier chosen from among these categories. Thus, a Quiz on the American Revolution may be designated by the title, "1.2.W Quiz: The American Revolution."

- **Lesson:** *Any item on the Modules page designated as a "Lesson"*

These include instructional content and sometimes an assessment of that content. Typically, a Lesson will be the day-to-day work that a student completes.

- **Assignment:** *Any item on the Modules page designated as an "Assignment"*

Typical examples of Assignments include, but are not limited to, papers, book reports, projects, labs, and speeches. Assignments are usually something that the student should do his or her best work on the first time.

- **Quiz:** *Any item on the Modules page designated as a "Quiz"*

This usually takes the form of a traditional assessment where the student will answer questions to demonstrate knowledge of the subject. Quizzes cover a smaller amount of material than Tests.

- **Test:** *Any item on the Modules page designated as a "Test"*

This usually takes the form of a traditional assessment where the student will answer questions to demonstrate knowledge of the subject. Tests cover a larger amount of material than Quizzes.

Materials Selection Policy

Ember curates educational materials that are consistent with the school's philosophy; however, the fallen human condition depicted in literature (as in Scripture itself) is not always pleasant. Valuable works sometimes have objectionable or profane elements. Good books provide four (4) recognized values.

- They build godly attitudes and character traits.
- They deepen our social and cultural awareness.
- They strengthen our use of written language.
- They provide a lifelong source of enjoyment and relaxation.

In order to instill these values in students and fulfill the stated objectives of the school, all Ember students are expected to read and study good books on a regular basis. Recognizing that materials designed for one level may not be appropriate for another, three (3) levels of criteria are applied:

- Elementary materials must contain no objectionable material,
- Objectionable elements in sixth through eighth-grade materials must be limited and must serve a specific educational purpose, and
- Objectionable content may be included in high school materials but must be outweighed by positive literary, curricular, and/or Christian values.

The curriculum department has approved required educational materials for students.

Resubmission Policy

Students are expected to submit their best work on the first submission for every Lesson, Assignment, Quiz, and Test. However, resubmissions may be permitted in the following circumstances:

- **Lesson:** Students are automatically permitted two attempts on a lesson. Students may freely resubmit for their first two

attempts without the need for teacher approval.

If a student feels that he or she deserves a resubmission on a Lesson, Assignment, Quiz, or Test due to a technical issue such as a computer malfunction, the student should message his or her teacher to make the request. With Ember, the teacher may be a physical school teacher or the student's parent/guardian. The teacher can give another attempt from his or her Canvas account. For more information on how to do this, please review the Ember orientation course.

Schedule

Module 1: Fundamentals of Geometry

- Week 1: Points, Lines, Planes, and Angles
- Week 2: Coordinate Tools
- Week 3: Transformations and Module 1 Assessment

Module 2: Reasoning & Writing Geometric Proofs

- Week 4: Inductive and Deductive Reasoning
- Week 5: Mathematical Proof and Module 2 Assessment

Module 3: Parallel & Perpendicular Lines

- Week 6: Lines with Transversals
- Week 7: Slope and the Equation of a Line
- Week 8: More Equation of a Line
- Week 9: Module 3 and Quarter 1 Assessments

Module 4: Triangle Congruence

- Week 10: Triangles and Congruence
- Week 11: Proving Triangle Congruence
- Week 12: Special Triangle Congruence and Module 4 Assessment

Module 5: Properties & Attributes of Triangles

- Week 13: Segments in Triangles
- Week 14: Relationships in Triangles
- Week 15: Special Right Triangles and Module 5 Assessment

Module 6: Polygons & Quadrilaterals

- Week 16: Polygons and Parallelograms
- Week 17: Other Special Quadrilaterals
- Week 18: Module 6 and Quarter 2 Assessments

Module 7: Similarity

- Week 19: Similarity Relationships
- Week 20: Applying Similarity and Module 7 Assessment

Module 8: Right Triangles & Trigonometry

- Week 21: Trigonometric Ratios
- Week 22: Applying Trigonometric Ratios
- Week 23: Vectors and Module 8 Assessment

Module 9: Extending Perimeter Circumference, & Area

- Week 24: Developing Geometric Formulas
- Week 25: Applying Geometric Formulas

- Week 26: Geometric Probability
- Week 27: Module 9 and Quarter 3 Assessments

Module 10: Spatial Reasoning

- Week 28: Three-Dimensional Figures
- Week 29: Surface Area and Volume
- Week 30: More Volume and Module 10 Assessment

Module 11: Circles

- Week 31: Lines and Arcs in Circles
- Week 32: Angles and Segments in Circles
- Week 33: More Segments in Circles and Module 11 Assessment

Module 12: Transformational Geometry

- Week 34: Congruence Transformations
- Week 35: Patterns
- Week 36: Module 12 and Quarter 4 Assessments