Unit 01: Introduction to Geometry

Content Area: **Mathematics**
Course(s): **Mathematics**
Time Period: **Week 1**
Length: **3 Weeks**
Status: **Published**

Unit Overview

In this unit, students will learn essential vocabulary and concepts that they will use in definitions and theorems for the remainder of this course. Students will be introduced to geometry as a mathematical system of logical thinking that is composed of undefined terms, definitions, postulates, and theorems. They will understand that algebra and geometry are different branches of mathematics, but they can be used in conjunction to solve problems. Students will review and extend their prior knowledge on basic geometric concepts such as points, lines, and angles. This unit contains the building blocks of geometry that students will need to use for the remainder of the course.

Standards

MA.G-CO.A.1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.

Essential Questions

1) Why must care be given when labeling and inspecting in the study of geometry?

2) How can algebraic principles be used to solve problems that involve angle measurement and segment length?

3) How can knowledge of problem-solving strategies assist in decision-making and real-world situations?

Application of Knowledge and Skills...

Students will know that...

- 1) the union of two sets is the set of all elements from both sets.
- 2) the intersection of two sets is the set of the elements that are common between both sets.
- 3) each degree in an angle is divided into 60 minutes.
- 4) objects are collinear when they lie on a straight line.
- 5) the sum of the lengths of any two sides of a triangle is always greater than the length of the third side.
- 6) two-column proofs are a method that can be used to prove theorems and other mathematical statements.
- 7) bisectors divide an angle or segment into two congruent parts while trisectors divide an angle or segment into three congruent parts.

Students will be able to...

- a) identify and name points, lines, rays, angles, and triangles.
- b) find the union and intersection of sets and geometric figures.
- c) convert degree measurements into degrees, minutes, and seconds.
- d) identify collinearity and betweenness of points.
- e) write basic two-column proofs.
- f) apply the definitions of bisectors and trisectors to find missing measurements and complete two-column proofs.

Assessments

- Daily Formative Assessments Formative: Other written assessments Formative assessments, such as Do-Now assignments, homework assignments, Tickets-to-Leave, and SmartPal response board practice problems, will provide daily data for teachers.
- Pre-Assessment Diagnostic: Other written assessments Students will be assessed on their prior knowledge of algebraic concepts that they will need to utilize during this course.
- Unit Quiz Formative: Written Test The unit quiz will include unions, intersections, angle measures, betweenness, assumptions from diagrams, and collinearity.
- Unit Test Summative: Written Test Students will be assessed on understanding of definitions for discussed geometric terms, finding missing angle and segment measurements, converting degree measurements to degrees, minutes, and seconds, recognizing congruency, writing basic two-column proofs, recognizing collinearity, and applying definitions and properties to find unknown information.

Activities

Communicator Practice

Students will complete differentiated practice problems on SmartPal response boards.

Cooperative Problem-Solving

Students will work cooperatively on challenge problems. This work may be presented by students, discussed

as a class, or collected for grading and comments.

Angle Bisector Construction

Students will construct an angle bisector by drawing an angle and using paper folds.

Triangle Inequality Investigation

Students will complete an investigation using an online geometry applet in order to discover the triangle inequality. This can be done on Netbooks or as a whole-class demonstration.

Triangle Inequality Investigation

Activities to Differentiate Instruction

Interactive Smartboard Activities will be utilized.

Students will work in mixed-level groups.

Students will be assigned optional and mandatory challenge problems on homework assignments.

Enrichment worksheets will be available for classwork and/or homework.

Guided notes and study guides will be provided accordingly.

Appropriately-leveled problems for students to solve when participating in communicator practice will be provided.

Students will be assigned missing measurement problems that will require solving systems of equations or quadratic equations.

Integrated/Cross-Disciplinary Instruction

- Students will understand that writing geometry proofs is similar to writing persuasive essays. They must take given information, build supporting details, and draw a conclusion.

Resources

McDougal Littell *Geometry for Enjoyment and Challenge* textbook and resources

Smartboard

Smart Exchange

McDougal Littell *Activity Generator* CD-ROM

Protractors

Rulers

Smart Exchange

21st Century Skills

CRP.K-12.CRP2.1	Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
CRP.K-12.CRP4.1	Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting

	with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.
CRP.K-12.CRP8.1	Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.
CRP.K-12.CRP11.1	Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
CRP.K-12.CRP12.1	Career-ready individuals positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.