Unit 4 (Part 1): Pythagorean Theorem, Triangles, and Parallel Lines
Algebra Prep

6 Class Meetings

Created May 2022

Essential Questions

- How can we use the Pythagorean Theorem to solve problems?
- How do the angles formed by two parallel lines and a transversal relate to each other?

Enduring Understandings with Unit Goals

EU 1: The Pythagorean Theorem can be used to solve problems about a right triangle.
- Use the Pythagorean Theorem to find a missing side of a right triangle.
- Use the Pythagorean Theorem to determine if a triangle is a right triangle.

EU 2: Lines, angles and shape have certain relationships
- Find interior and exterior angles of a triangle.
- Identify and find angles formed when parallel lines are cut by a transversal.

Standards

Common Core State Standards:

- **8.G.B.7:** Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
- **8.G.B.8:** Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
- **8.G.A.5**: Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.

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ISAAC Vision of the Graduate Competencies

Competency 1: Write effectively for a variety of purposes.
Competency 2: Speak to diverse audiences in an accountable manner.
Competency 3: Develop the behaviors needed to interact and contribute with others on a team.
Competency 4: Analyze and solve problems independently and collaboratively.
Competency 5: Be responsible, creative, and empathetic members of the community.

Unit Content Overview

1. **The Pythagorean Theorem**
   - Identify the sides of a right triangle
   - Find the length of the hypotenuse using the Pythagorean Theorem.
   - Find the length of a missing leg using the Pythagorean Theorem.
   - Use the distance formula to find the distance between two points.
   - Vocabulary: 90-degree angle, leg, hypotenuse, square-root, radicand, rounding, distance, axes, point, grid, coordinate plane.
2. **Determining a Right Triangle**
   - Use the Pythagorean Theorem to determine if a triangle is a right triangle.
   - Vocabulary: 90-degree angle, leg, hypotenuse, square-root, radicand, rounding, equal,
3. **Determine angles of triangles and parallel lines**
   - Find measures of interior and exterior angles of triangles
   - Identify and find types of angles created when parallel lines are cut by a transversal
   - Vocabulary: triangle, complementary angle, supplementary angle, interior angle, exterior angle, side, angle measure, degree, parallel lines, alternate-interior angle, alternate-exterior angle

Interdisciplinary Connection:

- Language Arts - Word Problems

Daily Learning Objectives with *Do Now Activities*

Students will be able to…

- Find a missing side of a right triangle using the Pythagorean Theorem
  - *Do Now – Simplifying Radicals (revisited)*
- Find the distance between two points using the distance formula.
  - *Do Now – Right Triangle on the Coordinate plane*
- Determine if a triangle is a right triangle.
  - *Do Now – Error Analysis - Pythagorean Theorem*
- Find measures of interior and exterior angles of a triangle.
  - *Do Now – Complementary and Supplementary Angles*
- Identify and find measures of angles formed by parallel lines being cut by a transversal
  - *Do Now – Error Analysis – Interior Angles of a Triangle*

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Instructional Strategies/Differentiated Instruction

- Whole-group instruction
- Creating authentic connections for students
- Rephrasing and restatement of information and concepts
- Guided notes
- Student-led instruction
- Small group instruction
- Independent problem-solving
- Collaborative problem-solving
- Cross-curricular problem solving (independent and collaborative)
- Accountable Talk
- Manipulatives
- Homework

EL DIFFERENTIATED INSTRUCTION:

- Word Walls with visuals
- TWPS (Think, Write, Pair, Share)
- Pre-reading strategies
- Culturally responsive teaching
- Explicit Modeling
- Key Vocabulary
- Graphic Organizers
- Strategic Grouping
- Non-verbal Assessments

Assessments

FORMATIVE ASSESSMENTS:

- Warm-ups (SBAC)
- ABCD Cards
- Whiteboards
- Mid-class check-ins
- Exit Slips
- Student-led instruction
- Homework
- Accountable Talk Discussions
- Daily Do Now

SUMMATIVE ASSESSMENTS:

- Edulastic Quiz – EU 1

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Unit Resources
● Flipped Google Classroom Videos ● Worksheets ● Calculator ● Laptops ● SBAC Prep Online ● Edulastic ● Kahn Academy ● Match Fishtank ● Map.Mathshell.org ● Online resources