

Unit 2: Parallel and Perpendicular Lines
Honor's Geometry
6 Meetings
Revised May 2023

Essential Questions

- How do the angles formed by two parallel lines and a transversal relate to each other?

Enduring Understandings with Unit Goals

EU 1: You can write the equation and graph a line when you know certain facts about the line.

- Write and graph a line using the slope, y-intercept, and points on the line.

EU 2: Using the slopes, you can determine if two lines are parallel or perpendicular.

- Write equations of parallel and perpendicular lines.

EU 3: The angles created by parallel lines and a transversal form special pairs.

- Identify the special pairs of angles as supplementary or congruent.
- Prove that the converse theorem is true.

Standards

Common Core State Standards:

- **HSG.GPE.B.5:** Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).
- **HSG.CO.A.1:** Know precise definitions of angle, perpendicular line, parallel line, and line segment.

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.

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Unit Content Overview

1. Equations of Lines in the Coordinate Plane

- Finding Slopes of Lines
- Forms of Linear Equations
- Graphing Lines
- Writing Equations of Lines

2. Slopes of Parallel and Perpendicular Lines

- Checking for Parallel Lines
- Writing Equations of Parallel Lines
- Checking for Perpendicular Lines
- Writing Equations for Perpendicular Lines

3. Properties of Parallel Lines and Angles

- Lines in 3D
- Angle Pairs Formed by Transversals
- Identifying an Angle Pair
- Identifying Supplementary Angles

4. Parallel and Perpendicular Lines

- Finding Measures of Angles
- Solving a Problem with Parallel Lines and a Transversal

Interdisciplinary Connection:

- Language Arts - Word Problems
- Science – Word Problems

Daily Learning Objectives with *TWPS Activities*

Students will be able to...

- Graph and write linear equations
 - *TWPS – What are the three main types of linear equations and how are they related?*
- Identify and relate slopes to parallel and perpendicular lines.
 - *TWPS – Explain the difference between two linear equations that are parallel and perpendicular to each other.*
- Identify special angle pairs formed by parallel lines and a transversal.
 - *TWPS – Find the error in the student's work when finding angle pairs.*
- Solve equations using properties of parallel lines to find angle measures
 - *TWPS – Which of the three statements about parallel and perpendicular lines is a lie? Explain.*

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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
- Independent problem-solving
- Collaborative problem-solving
- Cross-curricular problem solving (independent and collaborative)
- Accountable Talk
- Manipulatives
- Cumulative Homework
- Visuals to support instruction
- Small group instruction
- Pre-teaching and reteaching

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:

- Accountable Talk Discussions
- Daily Think-Write-Pair Share (TWPS)
- Daily Do Now
- Whiteboards
- Mid-class check-ins
- Exit Slips
- Cumulative Homework
- Performance Task – City Design
 - Problem Solving Rubric

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SUMMATIVE ASSESSMENTS:

- Edulastic Quiz – EU 1, EU 2
- Unit 2 Test
- Performance Task – City Design

Unit Task

Unit Task Name: City Design

Description: Students will use information learned in this unit about how special angle pairs are created by the intersection of a line with two or more lines, how the special angles formed by a parallel line and a transversal are either congruent or supplementary, and how certain angle pairs can be used to decide whether two lines are parallel (EU 3) in order to create a city design with various features. Students will be tasked with creating a city of parallel roads and two transversal roads. They will be given different angle pairs where crucial parts of the city need to be placed. Students can place the buildings wherever they want as long as they comply with angle rules. Students will create their city on large poster paper or a method of their choosing. Buildings and angle pairs will be labeled on a separate sheet of paper. Cities will have a theme and students will present their cities in small groups.

Evaluation: Problem Solving Rubric

Unit Resources

- Worksheets
- Calculator
- Laptops
- SBAC Prep Online
- Edulastic
- Kahn Academy
- Gimkit
- Quizizz
- Individual Whiteboards
- 2 Truths & One Lie
- State Common Core Standards Transition Tasks
- Online resources