

Teaching and Learning

Family Roadmap to Math Success in Louisiana

Geometry Overview

In Geometry, students apply definitions, properties, and transformations to understand and justify relationships in geometric figures. They use rigid motions to establish congruence and dilations to develop similarity, which leads to right-triangle trigonometry. Students analyze two-dimensional and three-dimensional shapes, explore circles and their properties, and use coordinate geometry to make algebraic connections. Through proofs, modeling tasks, and real-world applications, students build strong reasoning skills and deepen their understanding of the spatial world around them.

By the end of Geometry, your student will be able to:

- Understand and apply precise definitions of geometric terms such as angle, circle, perpendicular lines, parallel lines, and line segments.
- Use transformations—including reflections, rotations, translations, and dilations—to explore congruence and similarity.
- Prove geometric theorems involving lines, angles, triangles, and parallelograms.
- Understand similarity through transformations and use it to solve problems involving right triangles and trigonometry.
- Analyze and apply properties of circles, including arc length, sector area, and angle relationships.
- Use coordinate geometry to solve problems and prove geometric relationships.
- Apply geometric concepts to model and solve real-world problems involving area, surface area, and volume.

How can families help at home?

- Encourage your student to identify geometric shapes in everyday objects (buildings, signs, furniture).
- Have your student explain how they know two shapes are congruent or similar.
- Use a measuring tape or ruler around the house to discuss perimeter, area, and/or angles.
- Watch sports or architectural videos and discuss angles, symmetry, and transformations.
- Have them sketch simple objects and identify transformations (slide, flip, and turn).
- Talk about real-life situations that involve geometry, such as painting a room, building projects, or maps.

Building reasoning and problem-solving through word problems

Working through word problems helps students develop both their mathematical vocabulary and their reasoning abilities. Word problems support critical thinking, improve problem-solving strategies, and help students apply math concepts to real-world situations. Here are example word problems that Geometry students might work on:

- A designer wants to create a logo using a triangle and its reflection. Describe the transformation and prove that corresponding sides are equal.
- A ladder leans against a wall. Using similar triangles, determine the height the ladder reaches.
- A circular garden has a radius of 6 meters. What portion of the garden is covered by a 90° sector?
- A carpenter cuts wood to build a triangular frame. Explain how the Pythagorean Theorem proves the frame is a right triangle.
- A city park planner uses a scale drawing. If 1 inch represents 20 feet, determine actual distances using proportions.
- A cell tower casts a 45-foot shadow at the same time a nearby fence casts a 9-foot shadow. Find the height of the tower.

Family Engagement Tips

- Talk positively about math and encourage your child to maintain a growth mindset.
- Encourage your child to share/show you a different way to solve a math problem than you are familiar with and explain the reasoning for their approach.
- Celebrate mistakes as learning opportunities. Remind your child that making mistakes is part of learning and praise their efforts.
- Stay in touch with your child's teacher to learn what your child is learning and how to support it at home.
- Create a learning space for your child with supplies such as paper, pencils, rulers, calculators, and age-appropriate math manipulatives.

How does Geometry build on Algebra 1?

Geometry builds on Algebra I by applying algebraic reasoning to geometric situations. Students extend their understanding of transformations, coordinate geometry, and linear relationships to prove theorems, analyze shapes, and solve real-world geometric problems. Algebraic equations are used to explore geometric properties, model figures, and justify reasoning.

Math Conversations

Communicate with your child about math using open-ended questions:

- What strategy did you use to solve the problem?
- Why do you think your answer makes sense?
- If your answer was wrong, how could you check your work?
- How did you solve that problem?

Online Resources

- [Family Math Resources](#)
- [Family Literacy Resources](#)
- [School System Parent and Family Engagement Resources](#)