LOUISIANA DEPARTMENT OF EDUCATION

Teaching and Learning

Family Roadmap to Math Success in Louisiana

Grade 8 Overview

In Grade 8, students transition from arithmetic to algebraic thinking as they analyze relationships between quantities using functions, equations, and graphs. They develop a deeper understanding of linear relationships and use them to model real-world situations. Students also solve systems of equations and connect multiple representations of relationships. Students describe and analyze transformations to understand how figures change and relate to one another. They apply the Pythagorean Theorem to solve problems involving distance and right triangles and use geometric reasoning to make connections between algebra and spatial relationships. Students also extend their understanding of numbers to include irrational numbers and use mathematical reasoning to connect concepts across topics.

By the end of the grade, your child will be able to:

- Understand and represent functions using tables, graphs, equations, and verbal descriptions.
- Analyze linear relationships, including slope and rate of change, and interpret them in context.
- Write and solve linear equations and systems of equations, and explain what solutions mean in context.
- Use functions and graphs to model and compare real-world situations.
- Understand and apply the Pythagorean Theorem to solve problems.
- Describe and apply transformations to analyze geometric figures.
- Understand and approximate irrational numbers and locate them on a number line.
- Use mathematical reasoning to make connections between representations and concepts.

How can families help at home?

- Ask your student to explain what a graph or equation represents in a real-world situation.
- Use real-life examples (e.g., distance vs. time, cost vs. items) to discuss the rate of change.
- Encourage your student to explain their thinking and justify their answers.
- Ask your student to compare two situations and explain how they are similar or different.
- Have your student describe what slope means in context (for example, how fast something is changing over time).
- Ask your student to estimate solutions and explain whether their answers are reasonable.
- Have your student write and explain equations to represent real-world situations.
- Ask your student to explain how different representations (table, graph, equation) show the same relationship.

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 Grade 8 students might work on:

- A car travels at a constant speed and goes 120 miles in 2 hours. Write an equation to represent the relationship between distance and time. How far will the car travel in 5 hours?
- A ladder leans against a wall, forming a right triangle with the ground. If the ladder is 10 feet long and the base is 6 feet from the wall, how high does the ladder reach?
- The square root of a number is between 7 and 8. What could the number be? How do you know?
- A figure is reflected across the x-axis and then translated. How does the transformation change the position and orientation of the figure?
- A table shows the number of hours worked and total pay earned. How can you determine whether the relationship is linear? How can you find the rate of change?
- A graph shows the relationship between time and distance for two runners. How can you determine which runner is moving faster? How can you tell if one runner starts ahead of the other?
- Two students are saving money. One starts with $10 and saves $5 each week. Another starts with $25 and saves $3 each week. After how many weeks will they have the same amount of money? What does this represent?

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 grade 8 math build on grade 7?

Grade 8 builds on students' understanding of proportional relationships and equations from Grade 7 by extending these ideas to functions, linear relationships, and systems of equations. Students connect multiple representations of relationships and use them to model real-world situations. They also expand their understanding of numbers to include irrational numbers and apply geometric reasoning to solve problems.

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