8th Grade — # Parent Guide for Understanding the Math Common Core

Sacramento City Unified School District

	The Number System	Expressions and Equations	Functions	Geometry	Statistics and Probability
Students will be able to:	• Distinguish between a rational and an irrational number. • Understand that all numbers can be expressed as decimals and all fractions can be expressed as either terminating (0.5) or repeating decimals (0.333….). • Compare and order rational and irrational numbers on a number line. • Estimate irrational numbers.	• Apply properties of integer exponents to create equivalent expressions. • Differentiate between perfect and non-perfect squares and cubes. • Understand the inverse relationship between squares and square roots and cubes and cube roots. • Graph proportional relationships as linear equations and derive the equation $y = mx + b$. • Solve linear equations in one variable. • Solve pairs of linear equations in 2 variables.	• Understand the definition of a function. • Compare functions when presented in different ways • Understand that a linear equation is represented by a straight line; identify the slope and the y-intercept of a line. • Understand the difference between linear and non-linear functions.	• Understand congruence and similarity within geometric figures • Understand the effect of geometric transformations: rotations, translations, reflections, and dilations. • Use the Pythagorean Theorem to solve for missing sides of triangles.	• Construct and interpret scatterplots. • Model and interpret linear data. • Organize data in a two-way table and analyze frequencies.
Schools will support by providing opportunities to:	• Provide mathematical and real-world examples of where irrational numbers occur (π in circles, $\sqrt{2}$ in special right triangles). • Learn strategies for approximating irrational numbers. • Apply the process of converting decimals to fractions in a variety of real-world problems.	• Use powers of 10, properties of exponents, and scientific notation when solving application problem. • Relate squares and cubes to geometric shapes and solids. • Graph and analyze data that can be represented as a linear function. • Develop a variety of strategies such as modeling with tape diagrams, number properties, and tables to solve linear equations.	• Model and interpret real world phenomena that have linear and non-linear relationships. • Represent a function graphically, algebraically, and in a table. • Identify and interpret the slope and y-intercept of a line from either a graph, equation or a table.	• Use models, drawings, patty paper, transparencies, and geometric software to determine congruence and similarity. • Provide hands-on projects to prove the Pythagorean Theorem. • Solve real world problems using the Pythagorean Theorem.	• Design investigations in which students collect data and display it in scatterplots and two-way tables. • Explore patterns between two sets of data. • Compare information within or across data sets.
Parents can support by:	• Ask your child to explain the difference between a rational and irrational number and to show examples of both. • Ask your child to show how π can be derived from any circular object, such as a soup can, bicycle tire, hula hoop, CD, and coaster.	• Ask your child to analyze cell phone offers to determine which offer is the better deal. • Discuss the cost of using a credit card versus using a debit card with a fee to buy gasoline, and write an expression to show this relationship.	• Ask your child to plan for a baby-sitting business and then project potential profits based on the number of clients.	• Ask your child to create a logo or emblem that represents an activity they enjoy. Transform the logo by flipping, turning, re-sizing and sliding.	• Read the news with your child and interpret any tables and charts included in the articles. Discuss the validity of any conclusions reached.

Eighth Grade Students:

- Understand the concept of a function.
- Understand the difference between linear and non-linear functions.
- Can graph proportional relationships as lines.
- Compare functions when represented in a variety of ways.
- Differentiate between rational and irrational numbers.
- Express fractions as either terminating or repeating decimals.
- Use Pythagorean Theorem to solve problems.
- Apply statistics to investigate patterns.
- Represent and interpret data.

Resources:

Sacramento City Unified School District
http://www.scusd.edu/commoncoredept
- ✓ Links to documents for California (CCS) Common Core Standards, including videos for the Standards for Mathematical Practice

Parent-Teacher Association
http://www.pta.org/446.htm
- ✓ Parent Guides including key items that children should be learning in mathematics in each grade.

California Department of Education
http://www.cde.ca.gov/re/cc/index.asp
- ✓ Informational flyers provide overviews and highlights of the Math CCS
- ✓ Handouts for parents on transitioning to CCS
- ✓ Link to *Council of Great City Schools Parent Roadmaps*
- ✓ Links to *Smarter Balanced Assessments*

How Parents Can Support:

- Analyze nutritional data with your child. Create a scatterplot to compare sugar content and calories for favorite snack foods.

- Look at MC Escher drawings with your child. Look for and identify geometric transformations.

- Choose a stock and follow its value on the stock market with your child. Graph the stock's value and predict when to sell the stock for a profit.

- Share how you use math in your daily life.

- Encourage your child to be persistent if a problem seems difficult.

- When your child gets stuck on their homework, some questions to ask are:

   1) Can you tell me what you know now?
   2) What do you need to find out?
   3) Can you make a drawing or picture to get started?
   4) Can you show me what you did that didn't work?

How Things Have Changed:

Expectations of students have changed a great deal with the adoption of the Common Core State Standards in Mathematics. While getting the right answer is still a great achievement, students are now required to think mathematically, communicate their thinking, and justify their reasoning while continuing to develop a greater level of understanding of how math works.

Previous California Standards Assessment:
Write 4/5 as a decimal.

Answer: 0.8

Common Core Standards Assessment:
Without using the square root button on your calculator, estimate $\sqrt{800}$ as accurately as possible to 2 decimal places. Explain your reasoning.

Possible Answer:

Knowing that $20^2 = 400$ and $30^2 = 900$, the solution must be between 20 and 30, and it will be closer to 30 than to 20 (since 800 is closer to 900 than to 400). Then I made a chart to test a few numbers, starting at 28:

n	n^2
28	$28^2 = 784$
28.2	$28.2^2 = 795.24$
28.25	$28.25^2 = 798.0625$
28.28	$28.28^2 = 799.7584$

$$\sqrt{800} \approx 28.28$$