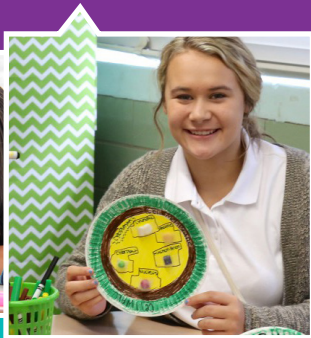# A FAMILY GUIDE FOR STUDENT SUCCESS

MISSISSIPPI
DEPARTMENT OF
EDUCATION

Ensuring a bright *future* for every child

A FAMILY GUIDE FOR STUDENT SUCCESS

7TH GRADE

The MDE would like to thank the following individuals for their expertise, commitment, and time devoted to the development of this guide.

FAMILY GUIDE FOR STUDENT SUCCESS COMMITTEE

MISSISSIPPI DEPARTMENT OF EDUCATION
Carey M. Wright, Ed.D.,
State Superintendent of Education

STUDENT EXPECTATIONS

Parents are their child's first teachers in life and know their child better than anyone else. Parents have valuable insights into their child's needs, strengths, abilities, and interests. The collaboration of parents and educators is vital in guiding each child toward success. The *Family Guide for Student Success* outlines what your child should learn at each grade level from pre-kindergarten through eighth grade. You can encourage your child's academic growth by reinforcing classroom activities at home. The *Family Guide for Student Success* booklets represent what all students should know and be able to do at the end of each grade level. The achievement of the expectations will help your child meet the assessment standards established by our state. It is only through your support and active participation in your child's education that we form a partnership for success for all the children in Mississippi.

If you have special questions regarding curriculum or school programs, please call your child's school. Do not be afraid to reach out to your child's teacher for additional activities to support mastery of the standards. This guide will help set clear and consistent expectations for your child, build your child's knowledge and skills, and help set high goals for your child.

READING

In grade 7, your child will continue reading and writing, but in addition to stories and literature, he will read more texts that provide facts and background knowledge in areas including science and social studies. He will read more challenging texts and be asked questions that will require him to refer back to what he has read. Your child will continue to develop the ability to cite relevant evidence when interpreting or analyzing a text or supporting his points in speaking and writing. There will also be an increased emphasis on building a strong vocabulary so that your child can read and understand challenging material. Your child will build academic vocabulary as he reads more complex texts, including stories, plays, historical novels, poems, and informational books and articles. Activities in these areas include:

- Reading, analyzing, and annotating a literary text to comprehend what the author says explicitly and to discover the levels of meaning embedded deeply within complex literary texts.

- Providing an analysis of plot structure and development (e.g., conflict and resolution, rising and falling action, subplots) and determining how events advance the plot, explain previous events, and foreshadow later events.

- Reading, analyzing and annotating a text for evidence of the meanings of words and phrases as they are used in a text.

- Conducting self-checks to ensure comprehension of an informational text, persevering through difficult sections, examining unfamiliar words or phrases and attempt to uncover the meaning of unknown words.

Your child can cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from a text.

- Analyze what a text says explicitly.

- Formulate inferences from textual material.

- Cite resources that support analysis of a text.

HELP AT HOME

▸ Give your child sticky notes to jot down thoughts, questions, predictions, inferences, and connections as he reads. Instruct your child to stick the notes to the corresponding page in the text and come back to those notes when answering questions about the text.
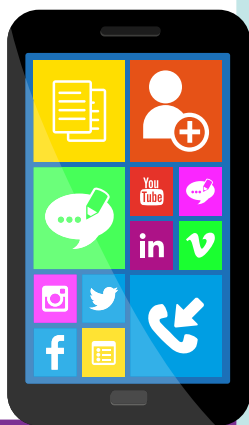
VOCABULARY

An **INFERENCE** is an idea that is drawn from the text. It is based on the details in the text and a reader's prior knowledge. It is not something that is directly stated. To infer is to make a guess about a passage based on what you read.

Your child can determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details. Your child can provide an accurate summary of the text based on this analysis.

- Recognize the theme or central idea.
- Identify supporting details.
- Develop an objective summary of the text.

HELP AT HOME

▸ Allow your child to use your social media account(s) to write short summaries of fun family activities or exciting events for friends and family members to see and respond to.

▸ Have your child take phone messages when an adult is unavailable to come to the phone. This teaches summarization, as he must overlook unnecessary information and only note the most important details.

▸ Complete a "Year in Review" notebook with the family. Keep an ongoing written record of family life by having each family member summarize important events that happen during the year. Add family photos when possible. Once a year, such as New Year's Eve, sit together and review all of the things that have happened in your family over the last year. These notebooks will improve the writing skills of your child as well as become family keepsakes later on.

VOCABULARY

THEME is the central, underlying, and controlling idea of a work of literature. It is the lesson or "moral" the author is trying to teach the reader. The theme of a text projects to the readers a universal idea. For example, the theme of "The Emperor's New Clothes" is that honesty is a rare virtue.

Your child can analyze how particular elements of a literary text interact with one another (e.g., how setting shapes the characters or plot).

- Determine how the elements of a story relate to one another.

- Determine how the elements of a story interact to move the story along.

- Explain how elements of a story change as they interact.

- Analyze characters' traits and actions to determine how they affect the setting, plot, theme, and other characters.

- Analyze characters' responses to events and interactions with others and how this affects setting, plot, other characters, and themes.

Your child can determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings. Your child can can analyze the impact of specific word choice (e.g., alliteration) on meaning and tone.

- Determine how the author's use of words and phrases controls the meaning and tone of the text.

- Point out examples of figurative language, rhyme, connotative meanings, alliteration, etc., and discuss why the author chose to include them.

HELP AT HOME

▸ Encourage your child to keep a vocabulary notebook. When he comes across an unfamiliar word or phrase while reading, have him record it in the notebook. Direct your child to look up the meaning of the word using reference books or an online search. Ask your child to restate the explanation in his own words in the notebook, and draw an illustration of the term beside his explanation.
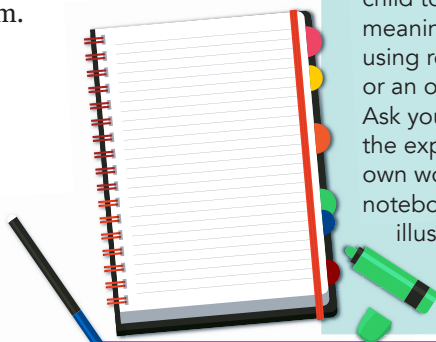
VOCABULARY

CONNOTATION refers to a meaning that is implied by a word apart from the things which it describes explicitly. Words carry cultural and emotional associations or meanings in addition to their literal meanings, or denotations. For example: Describing someone as "childish" has a negative connotation of immaturity, while describing someone as "youthful" brings to mind a person who is lively and energetic.

Your child can analyze how a drama's or poem's form or structure (e.g., soliloquy, sonnet) contributes to its meaning.

- Know that most plays are divided into acts and scenes.

- Know that each new scene in a play usually indicates a different time and place.

- Know that most poetry is a type of literature in which words are chosen and arranged to create a certain effect.

HELP AT HOME

▸ When reading poetry, have your child predict the meaning of the poem based only on the title. Next, have him come up with a one or two sentence paraphrase of the poem. Remind your child to look in the poem for meaning beyond the literal. Ask him to find and label examples of figurative language/literary devices. Have your child note shifts in speakers and in attitudes throughout the poem.

KINDS OF POETRY

There are many types of poetry, but three of the major kinds are soliloquy, sonnet, and ballad.

- A **SOLILOQUY** is a speech that one gives to oneself. In a play, a character talks to himself, thinking out loud so that the audience better understands the thoughts of the character.

- A **SONNET** is a poem of 14 lines, typically having 10 syllables per line.

- A **BALLAD** is a poem or song narrating a story in short stanzas.

VOCABULARY

A poem's **FORM** refers to the way a poem is laid out on the page, including the length and placement of the lines and the grouping of lines into stanzas.

Your child can analyze how an author develops and contrasts the points of view of different characters or narrators in a text.

- Understand that personal perspectives shape how events are perceived and described.

- Know the narrator/speaker in a story tells events from his or her own point of view.

- Ralize that events may be described differently, depending on whose point of view a story is being told from.

HELP AT HOME

▸ Encourage your child to use "The Most Important Thing" strategy. When reading, have him list two important ideas he understands about the author's point of view/ perspective and how it impacts the reader of the text. Then, have your child list the most important thing he learned from the text. This will build the connection between the author's point of view and how it impacts what readers learn from the text.

▸ Encourage your child to orally discuss or write another viewpoint of his favorite story. What if it was told from the point of view of another character in the story? What if the villain was the narrator? How and why would the story be different?

Your child can compare and contrast a written story, drama, or poem to its audio, filmed, staged or multimedia version, analyzing the effects of techniques unique to each medium (e.g., lighting, sound, color, camera focus and angles in a film).

- Identify how the visual presentation of a text supports the author's message.

- Know that the presentation of a text (e.g., visual or multimedia), enhances the reader's understanding of the text.

- Identify multimedia elements, including: lighting, sound, color, camera angles, and camera focus.

HELP AT HOME

‣ Take your child to a play or musical based on a written work that he has previously read. Discuss with your child the way the props, music, costumes, and actors' voices and movements bring the story to life. How does the lighting or background music change from scene to scene? Why?

‣ Discuss the ways you and your child think the film or stage version could have been improved. Ask your child questions such as: Did the scenery, casting, and music match the "picture" in your head from when you read the text? How could it have been changed to be more true to the original text, or do you think the changes improved the overall impression of the story?

RESOURCES

The following novels have been made into films and may be considered appropriate for junior high students (not a complete list): *Bridge to Terabithia* by Katherine Paterson, *Charlie and the Chocolate Factory* by Roald Dahl, *Diary of a Wimpy Kid* by Jeff Kinney, and *Harry Potter and the Sorcerer's Stone* by J.K. Rowling.

Your child can compare and contrast a fictional portrayal of a time, place, or character and a historical account of the same time, place, or character as a means of understanding how authors of fiction use and alter history.

- Understand that stories can share the same theme or topic even though the story elements may differ.

- Recognize that authors reveal the theme of a story by emphasizing a recurrent message through characters and events in a story.

HELP AT HOME

▸ Suggest a variety of texts surrounding a common historical event that interests your child (e.g., the Dust Bowl, the sinking of the Titanic, the Civil Rights Movement) in order to help your child see how different authors vary in their approach to communicating the same theme. Some of the texts should be informational (factual) and some of them should be fictional. This will help your child understand how information can be integrated from multiple texts on the same topic, a skill he will need for research papers in the future.

VOCABULARY

The main purpose of **INFORMATIONAL TEXTS** is to inform or instruct the reader in some way. Informational texts are complex, teach about the natural or social world, and are associated with text features such as diagrams, charts, tables, photographs, and illustrations.

By the end of the year, your child can read and comprehend literature (including stories, dramas, and poems) and informational texts in the grades 6-8 level proficiently, with scaffolding as needed at the high end of the range.

- Experience reading stories, drama, poetry, history, science, and technical texts.

- Comprehend grade-level literature at a proficient level when reading and working independently.

HELP AT HOME

▸ Offer your child incentives at home as his reading level increases throughout the year. If your child has an interest in a certain series of books or books on a certain topic, make those texts readily accessible for him. Help your child acquire a public library card and encourage him to use it.

▸ Reach out to your child's teacher for more texts, material, and activities to help your child at home.

HIGHLIGHTING TEXT

Highlighting for a purpose can help your child improve comprehension. All you need to get started is a handful of different colored highlighters and a sample essay you have written (editorials from the paper will also work).

- Use one highlighter to mark the essay's main idea or topic sentence, and any sentences that support the main idea.
- Use a different color to mark all the other "points" and their corresponding sentences.
- Explain to your child what you are doing as you work and discuss with your child what you see when done.
- Explain that you may find that some ideas were not expanded upon enough, or that sentences need to be moved around (grouped by color) to make better sense.
- Help your child decide which supports belong with which main idea and match the evidence to the claims.
- Have your child use this strategy to edit his own work.

Your child can trace and evaluate the argument and specific claims in an informational text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.

- Know that authors include details, in the form of reasons and evidence, which support and bring validity to particular points in an informational text.

- Identify which evidence supports which points.

- Examine sources and authors' opinions for credibility.

HELP AT HOME

▶ Listen with your child to a TV reporter, motivational speaker, or political candidate. Review the speaker's main points with your child and ask whether or not the speaker was trying to convince the audience of something. How was the speaker attempting to do so (what kinds of words, details, etc. were used)? Is the person speaking as an "expert" in his field? Who might be a better or more qualified person to speak on the topic?

▶ Teens can be challenging! Use that to your advantage. When disagreements arise, ask your child to put his reasons and supporting evidence into words by writing a short argument. As the parent, you do the same. Read each other's arguments and discuss which reasons are "good" and which are not. You can even take it a step further and each write a rebuttal in response to the original arguments. This is a great way to provide a "real-life" purpose for your child's writing.

A FAMILY GUIDE FOR STUDENT SUCCESS

MATHEMATICS

In Grade 7, your child will focus primarily on four critical areas. The first is developing an understanding of and applying proportional relationships. In addition, your child will develop an understanding of operations with rational numbers and work with expressions and linear equations. He will also solve problems involving scale drawings and informal geometric constructions, and work with two- and three-dimensional shapes to solve problems involving area, surface area, and volume. The fourth focus area is drawing inferences about populations based on samples.

Activities in these areas include:

- Setting up and solving ratios to include complex fractions.
- Constructing graphs or tables to determine if quantities are proportional and writing equations representing proportional relationships.
- Adding or subtracting up to 3 rational numbers with and without the use of a horizontal or vertical number line.
- Adding and subtracting up to 3 like or unlike fractions and mixed numbers.
- Multiplying and dividing integers and rational numbers.
- Reproducing a scale drawing that is proportional to a given geometric figure using a different scale.
- Identifying corresponding sides of scaled geometric figures.
- Constructing triangles from three given angle measures or from three given side measures.
- Calculating the area of circles, the circumference of circles, and identifying relationships between the two.
- Solving mathematical and real-world problems involving types of angles and their measures.
- Solve mathematical and real-world problems involving area, surface area, and volume of geometric figures.
- Drawing informal comparative inferences about two populations from random samples.

Your child can compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.

- Use a four-function calculator or standard algorithm to compute unit rates.

- Set up and solve ratios to include complex fractions.

- Determine when it is appropriate to use unit rate and understand when it has limitations.

HELP AT HOME

▸ Have your child determine the unit rate by measuring with ingredients (e.g., a recipe needs 1/3 cup of sugar to every 3/4 cup of flour). Let him determine the unit rate of sugar to flour (e.g., 4/9 cups of sugar to every cup of flour).

VOCABULARY

UNIT RATE is the amount per one unit.

Flour

Your child can recognize and represent proportional relationships between quantities. Your child can decide whether two quantities are proportional (e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin).

- Use a four-function calculator or standard algorithm to determine if two quantities are proportional.

- Determine proportionality between two quantities that are not whole numbers.

- Construct graphs or tables to determine if quantities are proportional.

- Solve problems beyond those that involve whole number values.

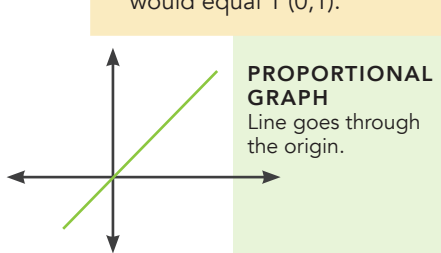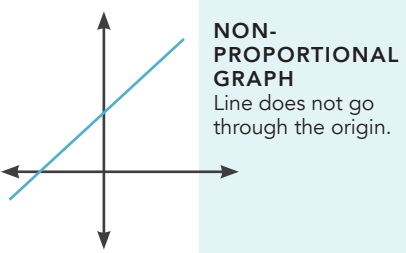- Determine if data is proportional or not and explain why or why not when given a table of values.

VOCABULARY

EQUIVALENT is equal.

PROPORTIONAL is when there is the same rate of change.

HELP AT HOME

▸ Have your child pour a liquid into a measuring cup to determine if ½ cup is equivalent to 4/8 cup. Let him fill the cup 1/8 full 4 separate times, pouring the liquid into a separate measuring cup each time. Determine if after 4 times the amounts are proportional or non-proportional.

▸ Create cards, some with proportional items and others with non-proportional items. Make two piles with the cards: one pile is graphs that are proportional, the other is non-proportional. If the graph has a line that goes through the origin, the graph is proportional. For example: y = 2x ; (1,2) (2,4) (3,6) is proportional because (0,0) would be on the line. However, 2x + 1 would not be proportional because when x = 0, y would equal 1 (0,1).

RESOURCES

NON-PROPORTIONAL GRAPH
Line does not go through the origin.

PROPORTIONAL GRAPH
Line goes through the origin.

Your child can recognize and represent proportions between quantities. Your child can identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

- Identify the unit rate given any of the various forms of proportions.

- Will not be allowed to use a four-function calculator to represent relationships in various forms.

- Create a table of values, a graph, and an equation that will describe the situation and determine if the situation represents a proportion, when given a real-world scenario.

- Compare proportions given in different forms (e.g.,tables, equations, diagrams, verbal expressions, graphs).

Your child can recognize and represent proportions between quantities. Your child can also represent proportions by equations.

- Solve equations involving proportions without a four-function calculator.

- Write equations representing proportions when provided a real-world context.

**Your child can recognize and represent proportional relationships between quantities. Your child can explain what a point (x,y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0,0) and (1,r) where r is the unit rate.**

- Interpret a point on the graph of a proportional relationship in terms of the situation.

- Describe what the point (0,0) means in the content in the graph or situation provided.

- Accurately draw a graph when the value of y is proportional to the value of x, and the constant or proportionality is provided.

- Will not be allowed to use a four-function calculator.

TOTAL PRICE ($) vs NUMBER OF HOT DOGS
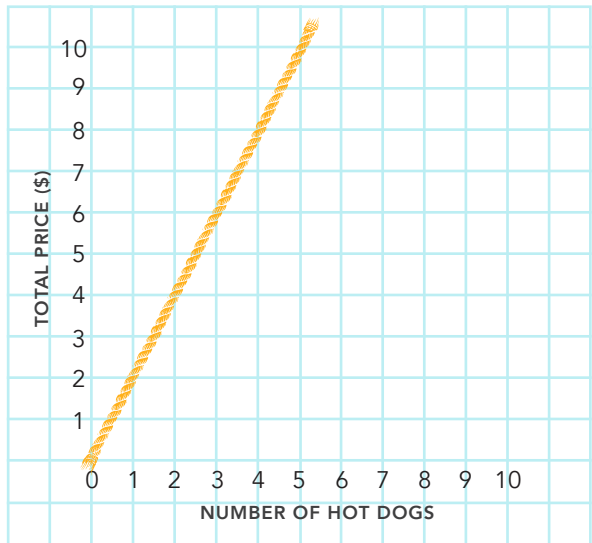
RESOURCES

See page 17 for examples of proportional and non-proportional graphs.

Your child can use proportional relationships to solve multi-step ratio and percent problems.

- Use a four-function calculator or standard algorithm to solve multi-step ratio problems.

- Set up and solve multi-step problems involving real-world percentages.

- Determine when it is appropriate to use unit rate and understand when it has limitations.

VOCABULARY

GRATUITIES are "tips" we give a server for a job well done. Common amounts are 10%, 15% or 20% of the original price.

A **COMMISSION** is a percentage of a sale that a worker earns.

Your child can apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; and can represent addition and subtraction on a horizontal or vertical number line diagram. Your child can also describe situations in which opposite quantities combine to make zero.

- Use a horizontal or vertical number line to add and subtract.

- Answer questions in a real-world context.

HELP AT HOME

▸ Use a thermometer to help your child understand adding and subtracting on a number line.

▸ Have your child give you a situation when the result would be 0 (e.g., the temperature rose 5 degrees by noon, but dropped 5 degrees by dark, thus the overall change was 0).

▸ Discuss when the result is negative and when the result is positive.

▸ Determine answers to real-world problems such as: During a football game, Danny lost 7 yards on a down. At the end of the next down he gained 5 yards. Explain what his team needs to do to show a positive gain of yardage on the next down.

Your child can apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; and represent addition and subtraction on a horizontal or vertical number line diagram. Your child can understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Your child can show that a number and its opposite have a sum of 0 (additive inverses) and can interpret sums of rational numbers by describing real-world contexts.

- Use a horizontal or vertical number line to illustrate p + q and p + (-q).

- Use a horizontal or vertical number line to illustrate p + (-p) = (-p) + p = 0.

- Determine the possible values of numbers that are a given distance from a known number.

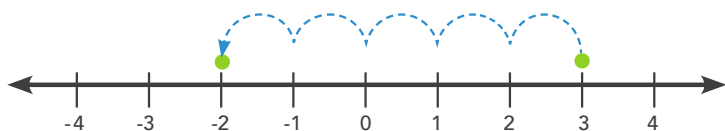- Explain, in a real-world context, the sum of rational numbers.

Your child can apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; and represent addition and subtraction on a horizontal or vertical number line diagram. Your child can understand subtraction of rational numbers as adding the additive inverse, p - q = p + (-q). Your child can also show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.

- Use a horizontal or vertical number line to illustrate p + q, p + (-q), and p + (-p) = (-p)+p = 0.

Distance between two integers on a number line = Absolute value of the difference of the integers

$$3 - (-2) = |5|$$
$$|5| = 5$$

OR

$$-2 - 3 = |-5|$$
$$|-5| = 5$$

Your child can apply and extend previous understandings of addition and subtraction to add and subtract rational numbers. Your child can also represent addition and subtraction on a horizontal or vertical number line diagram, and apply properties of operations as strategies to add and subtract rational numbers.

- Use a four-function calculator with square root to add and subtract rational numbers.

- Add or subtract up to three rational numbers both with and without the use of a horizontal or vertical number line.

- Add and subtract up to three like or unlike fractions and mixed numbers.

- Demonstrate conceptual understanding by producing, or recognizing, an expression equivalent to a given sum or difference.

HELP AT HOME

▸ Have your child practice adding and subtracting fractions and mixed numbers, some with a common denominator and some without a common denominator.

▸ Using a calculator, have your child practice adding and subtracting decimals and square roots on a calculator.

VOCABULARY

$\dfrac{1}{2}$

NUMERATOR is the top number in a fraction.

DENOMINATOR is the bottom number in a fraction.

Your child can apply and extend previous understandings of multiplication and division, and of fractions, to multiply and divide rational numbers. Your child can understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (-1) (-1) = 1 and the rules for multiplying signed numbers. He can also interpret products of rational numbers by describing real-world contexts.

- Multiply integers and rational numbers.

- Write properties for given mathematical statements.

- Solve real-world problems involving multiplication of integers.

- Demonstrate conceptual understanding by producing or recognizing equivalent expressions using properties of operations.

HELP AT HOME

▸ Review with your child how to multiply integers and rational numbers.

▸ Create a memory game matching the property to the example. Properties need to include: Multiplicative Property of Zero, Additive Inverse Property, Distributive Property, and Multiplicative Identity. Shuffle the cards, turn face down, then have your child turn two over. If they match, he keeps the cards; if not, he will turn the card back over and the next person takes a turn. The winner is the person with the most matches at the end of the game.

Multiplicative Property of Zero

$$13 \times 0 = 0$$

Additive Inverse Property

$$-21 + 21 = 0$$

$$4 \times 1 = 4$$

Multiplicative Identity

Below is a table describing some math properties.

| Name	Hints	Example	Notes
Associative "Grouping"	You "associate" with different groups.	$5 + (15 + 4) =$ $(5 + 15) + 4$	Works with addition and multiplication, not subtraction or division.
Commutative "Ordering"	Since Commutative has an "o" in it, think "order".	$5 + 4 + 3 =$ $4 + 3 + 5$	Works with addition and multiplication, not subtraction or division.
Distributive "Distributing or Pushing Through Parentheses"	Think of "distributing" something to your friends.	$5 \times (3 + 4) =$ $5 \times 3 + 5 \times 4 =$ $15 + 20 = 35$ $5 - 2(x - 3) =$ $5 - 2x + 6$ $5x + 7x =$ $(5 + 7)x = 12x$	When negatives are on the outside of the parenthesis, make sure you distribute the negatives to second number, too. Remember that multiplying two negatives results in a positive.
Identity "Staying the Same"	You always come back to your "identity".	$9 + 0 = 9$ $9 \times 1 = 9$	Additive identity is 0. Multiplicative identity is 1.
Inverse "Undoing"	When you put your car in "inverse", you go backwards.	$9 + -9 = 0$ $9 \times \dfrac{1}{9} = 1$	Additive inverse is $-a$, since $-a + a = 0$. Multiplicative inverse is $\frac{1}{a}$, since $\frac{1}{a} \times \frac{a}{1} = 1$. Note that the inverse of $\frac{a}{b}$ is $\frac{b}{a}$, since $\frac{a}{b} \times \frac{b}{a} = 1$.

Image from http://stjohnsmath.weebly.com/133.html

Your child can apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. Your child can understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then (p/q) = (-p)/q = p/(-q). Interpret quotients of rational numbers by describing real-world contexts.

- Divide integers and rational numbers.

- Solve real-world problems involving division of integers and rational numbers.

- Evaluate an expression using division.

- Demonstrate conceptual understanding by producing or recognizing equivalent expressions using properties of operations.

HELP AT HOME

▸ Ask your child questions such as: If Tom owes Sam $10 (-10), can two people give Tom $5 each (-5 and -5), such that Tom now owes each of them $5? Will his debt to Sam be paid in full?

▸ Discuss with your child the steps to dividing rational numbers and integers. Discuss if it affects the answer if the negative number is in the numerator or denominator of a fraction.

Your child can apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. Apply properties of operations as strategies to multiply and divide rational numbers.

- Multiply and divide up to three rational numbers.

- Demonstrate conceptual understanding by producing or recognizing equivalent expressions using properties of operations.

HELP AT HOME

▸ Extend one of the games played in previous activities by including examples with up to three numbers.

Your child can apply and extend previous understandings of multiplication and division, and of fractions, to multiply and divide rational numbers. Your child can convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.

- Write a fraction or a mixed number as a decimal using long division.

- Write a decimal as a fraction or mixed number in simplest form.

- Use long division to express fractions as decimals.

- Explain which fractions will result in terminating or repeating decimals.

HELP AT HOME

▸ Review with your how to do a long division algorithm. Discuss that the divisor can be larger than the dividend, resulting in a number less than one.

▸ Have your child classify fractions as terminating (stopping), repeating, or not terminating (not stopping) decimals.

▸ Using place value, have your child convert a decimal to a fraction.

Your child can solve real-world and mathematical problems involving the four operations with rational numbers.

- Add, subtract, multiply, and divide rational numbers when provided a real-world context.

HELP AT HOME

▸ Use measurement tools, such as a measuring cup, to review adding and subtracting rational numbers with your child.

▸ Help your child find the area of a rectangle with rational dimensions.

▸ Have your child find the length of a rectangle given the area and the width.
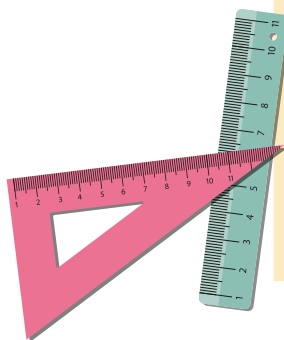
Your child can apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational numbers.

- Add, subtract, factor, and expand linear expressions with and without rational coefficients.

- Utilize properties of operations to rewrite expressions in a different form.

- Use division to express a linear expression by its factors and then also expand by using multiplication to rewrite the factors in a linear expression as a product.

- Produce and identify equivalent expressions.

HELP AT HOME

▸ Group fruit. Place 3 apples, 3 oranges, and 6 bananas on the table. Put the fruit in groups of 3 (e.g., 1 group of apples, 1 group of oranges, and 2 groups of bananas). Relate to the problem: $3x + 3y + 6z = 3(x + y + 2z)$. Repeat with and without visuals.
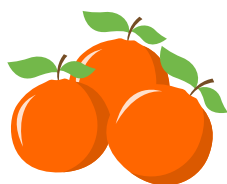
Your child can understand that rewriting an expression in different forms within the problem can shed light on the problem and how the quantities in the problem are related.

- Write an expression from a real-world experience, possibly involving sales tax, tip, discount, gratuity, markup, selling price, perimeter, area, and angle measures of a triangle.

- Evaluate an expression given a value for the variable.

- Translate verbal expression into an algebraic expression.

- Use manipulatives such as algebra tiles to factor expressions.

HELP AT HOME

▸ Have your child solve a sales tax question. Tell him to highlight where the numbers changed from one form (percent) to another (fraction or decimal) to make the problem easier.

▸ Make flashcards on which one side has the algebraic expression, the other side has the verbal expression.

VOCABULARY

An **ALGEBRAIC EXPRESSION** is the problem written with numbers and variables.

A **VERBAL EXPRESSION** is when the problem is spelled out in words.

4x - 12

Twelve less than the product of 4 and x.

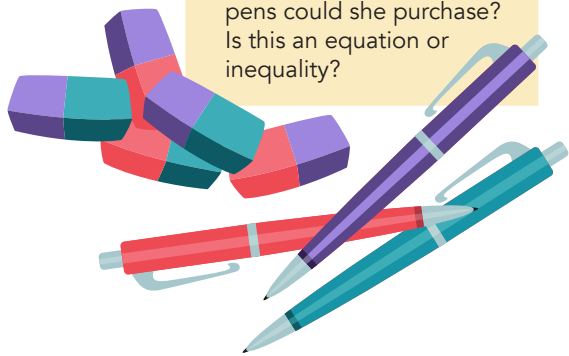**5(x + 3)**

The product of 5 and x plus 3.

3 - x

The difference of 3 and x.

Your child can use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. Your child is able to solve word problems leading to equations of the form px + q = r and p(x+q) = r where p, q, and r are specific rational numbers. He can solve equations of these forms fluently, and can also compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.

- Solve multi-step equations derived from word problems.

- Use arithmetic from a given problem to generalize an algebraic solution.

- Explain how to determine whether to write an equation or inequality and the properties of the real number system that was used to find a solution.

HELP AT HOME

▸ On a set of steps in your house, have your child solve each step of a given problem on a different step. This helps your child remember to show and explain the "steps" to his solution. Create problems such as: Macy bought 5 erasers for $2.50 each. She then bought some pens that were $2.00 each. She only had $30. How many pens could she purchase? Is this an equation or inequality?

Your child can use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. Your child can solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q and r are specific rational numbers. He can also graph the solution set of the inequality and interpret it in the context of the problem.

- Solve multi-step inequalities derived from word problems.

- Graph the solution set of the inequality.

- Use arithmetic from a given problem to generalize an algebraic solution.

- Explain how to determine whether to write an equation or inequality and the properties of the real number system that was used to find a solution.

HELP AT HOME

▸ Solve real-world problems involving equations or inequalities. For example, Ronnie makes $12.50 an hour, plus $2 for each sale. If he worked 20 hours and his paycheck was over $260, how many sales did he make? Repeat with similar problems.
Have your child explain how he determined if it was an equation or inequality. To extend learning, have your child graph each solution on a number line.

VOCABULARY

An **EQUATION** has an equal (=) sign.

An **INEQUALITY** has a greater (>) or less (<) than sign.
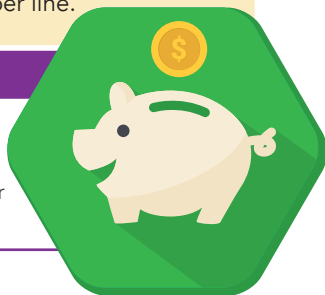
Your child can understand that statistics can be used to gain information about a population by examining a sample of the population. He knows generalizations about a population from a sample are valid only if the sample is representative of that population. He also understands that random sampling tends to produce representative samples and support valid inferences.

- Use a four-function calculator to assist in determining statistics.

- Apply statistics to gain information about a population from a sample of the population.

- Determine statements that are supported by data obtained from a survey as it pertains to the whole population and not just the sampling provided.

HELP AT HOME

▸ Have your child do a survey where random people are asked questions. Have him use people for his survey who do not have a lot in common. Be sure it is a random population (e.g., ask people of varying ages how often they watch television).

▸ Using graphs from the Internet, have your child practice interpreting information. Use this information to help come to conclusions about the data.
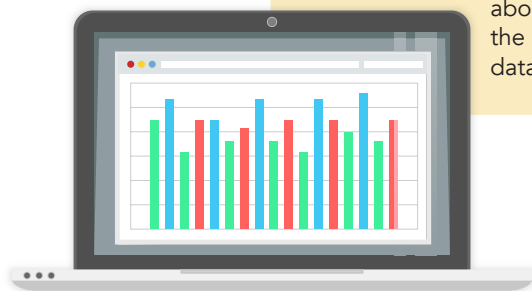
Your child can use data from a random sample to draw inferences about a population with an unknown characteristic of interest. He is also able to generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.

- Use a four-function calculator to assist in determining statistics.

- Compare a random sample to the overall population.

- Describe a method of sampling to answer simple questions about the population in all, based on a large amount of data.

HELP AT HOME

▸ Have your child estimate the word length on a page in a book by doing a random sample of various length words on the page.

▸ Allow your child to use your social media account(s) to do a random survey (e.g., how many people prefer chicken over beef). Then have him take the information and record it in a table.

Your child can informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.

- Use a four-function calculator to assist in determining statistics.

- Use data from two populations to persuade two different sides of an argument.

- Use mean absolute deviation or range as a measure of variability in a task.

- Compare two numerical data distributions on a graph by using visual data displays, and assessing the degree of overlap.

- Compare the differences in the measure of central tendency in two numerical data distributions by measuring the difference between the centers.

HELP AT HOME

▸ Help your child research prices for various TV brands at two different stores. Have him make a graph of each store's data and determine the centers of each set of data. Then have him compare the results.
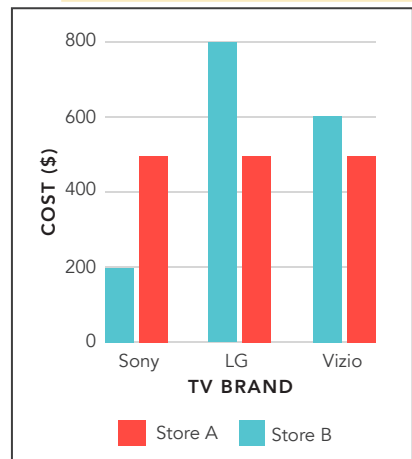
Your child can use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.

- Use a four-function calculator to assist in determining statistics.

- Draw informal comparative inferences about two populations from random samples.

HELP AT HOME

▸ Have your child decide whether the word "the" is generally used more often on 5 pages of a newspaper or 5 pages of a magazine.

Your child can understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. He knows larger numbers indicate greater likelihood and probability near 0 indicates an unlikely event. He understands a probability around ½ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

- Use a four-function calculator to assist in determining probability.

- Draw conclusions to determine that a greater likelihood occurs as the number of favorable outcomes approaches the total number of outcomes.

HELP AT HOME

▸ Using a regular deck of cards, have your child determine various probabilities (e.g., probability of choosing a red face card = 6/52 or 3/26).

▸ Discuss with your child if the solution is unlikely, likely, or neither.

Your child can approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and also predict the approximate relative frequency given the probability.

- Use a four-function calculator to assist in determining probability.

- Compare experimental results to theoretical predictions.

- Predict the relative frequency (experimental probability) of an event based on the (theoretical) probability.

HELP AT HOME

▸ Have your child predict how many times a certain number will occur when you roll dice or a number cube (theoretical). Then have him do the experiment and compare the actual results (experimental) to the theoretical probability.

A FAMILY GUIDE FOR STUDENT SUCCESS

Your child can develop a probability model and use it to find probabilities of events. He can compare probabilities from a model to observed frequencies, and if the agreement is not good, explain possible sources of the discrepancy. He is able to develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.

- Use a four-function calculator to assist in determining probability.

- Develop a uniform probability model and use it to determine the probability of each outcome/event.

- Analyze a probability model and justify why it is uniform or explain the discrepancy if it is not.

HELP AT HOME

▸ Develop various activities for your child to conduct to determine probability of events. For example: make a spinner and determine if outcomes are fair. Are spaces the same size? Are there equal chances for each choice?

Your child can develop a probability model and use it to find probabilities of events. He can compare probabilities of events and is able to compare probabilities from a model to observed frequencies. If the agreement is not good, he can explain possible sources of the discrepancy. He can also develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.

- Use a four-function calculator to assist in determining probability.

- Use data provided for tasks assigned. If the task is technology-enhanced, the task can simulate a data-gathering process.

- Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.

HELP AT HOME

▸ Create various activities where the outcomes are not fair. Have your child determine the probability that the event will occur. Ask your child which will most likely occur the most often? The least often? Why?

Your child can find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. He can understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
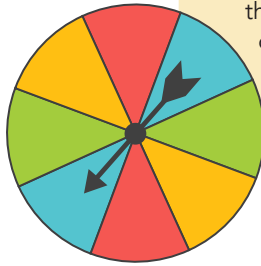
- Use a four-function calculator to assist in determining probability.

- Define and describe a compound event.

Your child can find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. He can represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams.

- Use a four-function calculator to assist in determining probability.

- Complete a table to display possible outcomes of a compound event.

Your child can find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. He is able to design and use a simulation to generate frequencies for compound events.

- Use a four-function calculator to assist in determining probability.

- Design and use a simulation to generate frequencies for compound events.

HELP AT HOME

▸ Create a simulation for a given event. For example: Make a spinner with four equal sections labeled A, B, C, and D. Have your child use the spinner to predict the probability of an answer being A on a 100-question multiple choice test by spinning the spinner 100 times (rather than actually taking the test).

Your child can solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

- Use a four-function calculator to determine actual lengths and area of scale drawings.

- Solve problems involving scale drawings when given mathematical or real-world problems.

- Reproduce a scale drawing that is proportional to a given geometric figure using a different scale.

- Identify corresponding sides of scaled geometric figures.

HELP AT HOME

▸ Have your child determine what the scale ratio is for the length and width of a 4 x 5 photo to an 8 x 10 photo.

▸ Given a scale ratio of 1cm = 2 feet, have your child draw a scale drawing of a particular room in your house, by first measuring the actual length and width of the room in feet.

VOCABULARY

$$\text{SCALE RATIO} = \frac{\text{amount on paper}}{\text{actual amount}}$$

Your child draws geometric shapes with given conditions. He can focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.

- Use a four-function calculator to assist in identifying angle measures found in geometric shapes.

- Solve mathematical problems involving the construction of triangles.

- Construct triangles from three given angle measures.

- Construct triangles from three given side measures.

HELP AT HOME

▶ Make a set of cards with various side lengths and angle measures written on them. Have your child pull three cards and determine if it is possible to make a triangle with the three dimensions. If so, have your child determine if there is more than one way to draw the triangle with the same dimensions.

Your child can describe the two-dimensional figures that result from slicing three-dimensional figures, as plane sections of right rectangular prisms and right rectangular pyramids.

- Use a four-function calculator to assist in describing two-dimensional figures resulting from slicing three-dimensional figures.

- Solve simple real-world problems or mathematical problems involving two and three-dimensional figures.

HELP AT HOME

▶ Have your child make three-dimensional figures with play dough. Then have him slice the top off with a string. What shape did the slice create? Repeat this activity with various kinds of slices and shapes.

RESOURCES

BASIC 3D SHAPES

prism

sphere

cylinder

pyramid

cuboid

cone

cube
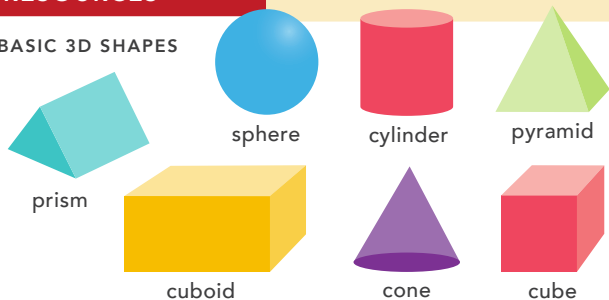
BASIC 2D SHAPES

|			
circle	triangle	square	star
rectangle	pentagon	hexagon	octagon
rhombus	trapezoid	oval	parallelogram

Your child can identify the formulas for the area and circumference of a circle and use them to solve problems. He is able to give an informal derivation of the relationship between the circumference and area of a circle.

- Use a four-function calculator to assist with calculating the area of circles, the circumference of circles, and when identifying relationships between the two.

- Write answers in terms of π when directed.

- Identify and produce a logical conclusion about the relationship between the circumference and the area of a circle.

HELP AT HOME

▶ Have your child determine the circumference of the lid to a whipped topping bowl, and the area of the lid. Next have him determine the circumference of the lid to a pickle jar, and the area of the lid. Then have him compare and contrast the different circumferences, areas, and lids.

RESOURCES

diameter / radius
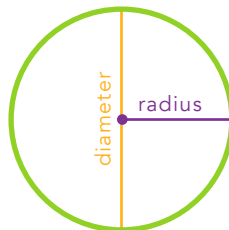
CIRCUMFERENCE

$C = 2\pi r$ OR $C = d\pi$

radius
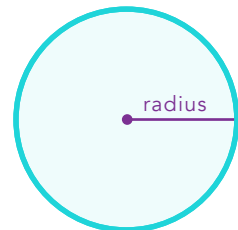
AREA

$A = \pi r^2$

Your child uses facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve equations for an unknown angle in a figure.

- Use a four-function calculator to assist in classifying and solving problems dealing with various types of angles.

- Solve mathematical and real-world problems involving types of angles and their measures.

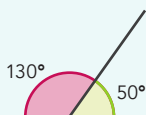- Determine the complements and supplements of a given angle.

RESOURCES

55°
35°
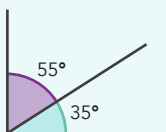
COMPLEMENTARY ANGLES
Two angles with a sum of 90°

ACUTE ANGLE
Less than 90°

130°
50°

SUPPLEMENTARY ANGLES
Two angles with a sum of 180°

RIGHT ANGLE
Exactly 90°

VERTICAL ANGLES
Opposite angles formed by two intersecting lines

REFLEX ANGLE
Greater than 180°

STRAIGHT ANGLE
Exactly 180°

shared side

vertex

ADJACENT ANGLES
Share a side and a common vertex

OBTUSE ANGLE
Greater than 90° but less than 180°
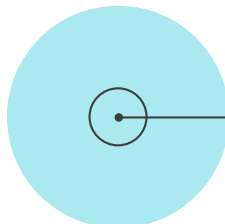
FULL ROTATION
Exactly 360°

Your child can solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

- Use a four-function calculator to assist in calculating the area of two- and three-dimensional figures.

- Solve mathematical and real-world problems involving area, surface area, and volume of geometric figures.

- Use formulas involving whole numbers, fractions, decimals, ratios, and various units of measure with same system conversions.

HELP AT HOME

▸ Have your child determine the volume of a cereal box. Then have him determine the surface area of the box by finding the sum of the area of each face. Repeat with various size boxes that would involve fraction measurements.

MISSISSIPPI DEPARTMENT OF EDUCATION

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