

8TH

A FAMILY GUIDE FOR **STUDENT SUCCESS**

EIGHTH GRADE
Concepts of Literacy and Mathematics



The Maryland State Department of Education would like to thank the Mississippi Department of Education for allowing the adaptation and incorporation of this guide to support Maryland families and children.

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Deaf and Hard of Hearing Use Relay

Dear Families,

Parents and guardians are their child's first teachers, and your insight is essential to helping your child succeed. When families and educators work closely together, students benefit.

The Family Guide for Student Success outlines the key literacy and math skills your child will learn from pre-kindergarten through eighth grade. These guides show what students should know by the end of each grade and support your child in meeting Maryland's learning expectations.

Your partnership with your child's teacher makes the biggest difference. Stay in communication, ask questions, and reach out for ideas or activities to support learning at home. If you have questions about curriculum or school programs, please contact your child's school.

This guide is here to help us set clear expectations, strengthen skills, and support every child's growth, together.



Carey M. Wright, Ed.D.,
State Superintendent of Schools

HOW TO USE THE FAMILY GUIDES

In the guide that follows, you will notice that some tips have special symbols next to them. These symbols show which children might find that tip most helpful, since every child learns differently.

Use the key below to help you choose the tips that are most helpful for your child:



CIRCLE: For Children Learning English

Look for this symbol if your child is learning English as another language. These tips are great for building language skills while working on building reading and math skills. All of the activities can be completed in your child's home language as well as English.



SQUARE: For Children Who Need a Little Extra Help

This symbol means the tip might be especially helpful for children who need more time or practice to really understand a skill. These ideas can help make learning feel easier and less frustrating.



TRIANGLE: For Children Who Are Ready for a Challenge

If your child already understands a skill and is ready for something more, look for this symbol. These tips offer fun ways to go deeper and keep learning exciting.

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LITERACY

In grade 8, your child will continue reading and writing, but in addition to literature, they will read more texts that provide facts, and build their knowledge while drawing on their background knowledge in areas such as science and social studies. They will read more challenging texts and be asked questions that require them to refer back to what they have read. 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 read major works of fiction and nonfiction from all over the world from different time periods. They will continue to learn how to understand what they read and how to evaluate an author's assumptions and claims. They will also conduct research that will require the analysis of resources and accurate interpretation of literary and informational texts. Activities in these areas include:

LANGUAGE

- Demonstrating command of standard English when writing or speaking.
- Applying a range of strategies to interpret unfamiliar academic and content words at a grade 8 level, as well as knowledge of Greek and Latin roots.

COMPREHENSION

- Using specific details from a text to support their ideas and explanations about what they have read.



COMPREHENSION (CONTINUED)

- Identifying the main message or theme of a story or article and summarizing how that idea develops from beginning to end.
- Understanding how authors use word choices, analogies, and references to other works to create a specific mood or tone.
- Comparing different texts to see how their structure affects the overall meaning and style of the writing.
- Evaluating an author's argument and claims, deciding if the reasoning is logical and supported by enough evidence.
- Comparing how different authors might present conflicting information on the same topic and identifying where they disagree.

SPEAKING AND LISTENING

- Participating in discussions by analyzing and responding to others' ideas and reasoning.

WRITING

- Planning and writing three main types of writing—papers that argue a viewpoint, reports that explain information, and effective stories—making sure the writing is right for the goal and the reader.

Your child can demonstrate command of standard English when writing or speaking.

- Use punctuation (commas, ellipses, dashes) to indicate a pause or break in a sentence.
- Deepen understanding of verb use when writing or speaking.
- Spell grade-appropriate academic and content words correctly in writing.

HELP AT HOME

- ▶ Encourage your child to read their writing aloud before finalizing it. This will help them notice when sentences end abruptly or go on for too long, or if punctuation needs to be added or removed.
- ▶ Provide a wide variety of reading materials for your child (books, magazines, manuals, newspapers, etc.). Read some of these materials together and discuss interesting ways authors communicate, including through sentences.



VOCABULARY

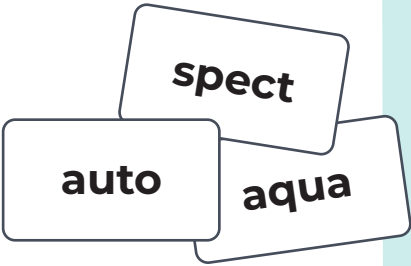
ELLIPSES

A set of three dots (...) that acts as a sign in writing that words have been intentionally left out of a quote or thought. (I thought I heard something...)



Your child can apply multiple strategies to interpret unfamiliar academic and content words.

- Use context (the surrounding words and/or sentences) to determine the meaning of an unknown word.
- Use common grade-appropriate Greek or Latin roots as clues to the meaning of a word (precede, recede, secede).
- Consult dictionaries, glossaries, or thesauruses, both print and digital to find the meaning of unknown words and phrases.



COMMON GREEK & LATIN ROOTS

GREEK

astro (star)	-logy (study of)
auto (self)	tele (far)
bio (life)	therm (heat)
hydr (water)	

LATIN

aud (hear)	ject (throw)
aqua (water)	port (to carry)
-cede (yield, surrender)	scrib/scribe (to write)
cred (believe)	spect (to see)
form (shape)	struct (to build)
fract (to break)	vid/vis (see)

HELP AT HOME

- ▶ Create a Greek and Latin roots jar filled with Greek or Latin roots and their meaning on index cards. Pull an index card with a Greek or Latin root out of the jar and look for as many words as you can find with that root in texts, movies, TV shows.
- ▶ Provide your child with a wide variety of reading materials on topics they are interested in. Discuss words that have Greek or Latin roots and how they show up in the text. Your local public library is a great resource for this.
- ▶ Have your child notice when words in their environment contain Greek or Latin roots that offer clues to their meaning. For example, “We will be spectators at your brother’s football game. How does the meaning of that word connect to the meaning of the root ‘spect’ (to see)?”

Your child can cite (mention, quote, or refer to) the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.

- Learn that evidence is considered strong when it both convinces the reader and effectively expresses the central ideas or theme(s) of the text.
- Read closely to determine both explicitly stated and implied meanings in a text.



HELP AT HOME

► Have your child read to find the author's purpose and overall message of the text. To guide thinking, have your child mark the text as they read. Highlight repeated ideas or patterns throughout the text, each with a separate color. This will help your child determine the author's overall message. Instruct your child to sort the highlighted information into categories (e.g., evidence that is weakly tied to the overall theme and evidence that is strongly tied to the overall theme).

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. For example, the theme of "The Ugly Duckling" by Hans Christian Andersen is the search for personal identity or uniqueness, rather than conforming to society's standards.



Your child can determine a theme or central idea of a text and analyze in detail its development over the course of the text. They can provide an accurate summary of the text based on this analysis.

- Look for, and record, ideas or events that are repeated throughout the story.
- Note how repeated disagreements between characters, changes in the setting, and surprising plot developments all help shape the story’s main message (theme).

HELP AT HOME

- ▶ Have your child use a story map like the one below to reveal the overall theme of the text. Seeing the basic story elements (characters, setting, plot, and theme) broken down into manageable pieces, your child should be able to write a summary of how the central idea changes over the course of the text.
- ▶ Encourage your child to think about the theme of movies or T.V. shows they watch. Have them state the “life lesson or message” in a sentence. For example, “Best friends will always be there for you.” or “It takes hard work to achieve your goals.”

RESOURCES

SAMPLE STORY MAP

STORY ELEMENT	EXAMPLE
CHARACTERS	• Who are the people who were involved? • Which ones played major roles? • Which ones were minor?
SETTING	• Where and when did this event take place? • Over what period of time did the event occur?
PLOT	• Problem/Goal: What set events in motion? What problem arose, or what were the key players after? • Events/Episodes: the key steps or events that capture the progress of the situation. • Resolution/Outcome: How was the problem solved? Was the goal attained?
THEME	• The larger meaning or importance, the moral, the "so what?"

Your child can analyze how particular lines of dialogue or incidents in a literary text propel (move) the action, reveal aspects of a character, or provoke a decision.

- Determine how specific events or dialogue significantly impact the development of a story.



ADDITIONAL HELP AT HOME

- ▶ Have a conversation with your child after watching a movie, play, or T.V. show. Discuss how a character changes from beginning to end of the story. Ask your child if they can recall certain lines of dialogue or incidents that showed that the character was changing in some way.

VOCABULARY

A struggle that takes place in a character's mind is called an **INTERNAL CONFLICT**. For example, a character may have to decide within himself between right and wrong.

A struggle between a character and an outside force (another character, the community, or nature) is called an **EXTERNAL CONFLICT**. For example, a main character who is struggling against an arctic winter cold is experiencing an external conflict with nature.

HELP AT HOME

- ▶ After reading a text, go back through and have your child determine (mark or highlight) critical turning points in the story, analyze the internal and external choices of the characters, and examine the conflicts in the story to see how the momentum of the story builds.
- ▶ Once the critical moments have been identified, your child should explain the cause and effect that the critical moment had on the plot of the story.
- ▶ Encourage your child to read children's books with younger siblings/friends/relatives. After reading, have your child identify how the main character changes throughout the story and where the turning points are. Ask "What lines of dialogue reveal a change in the character?" or "What incidents cause the characters to make a decision?"



Your child can determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings. They can also analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.

- Identify words and phrases that create and reveal a variety of tones.
- See the link between word choice and tone.
- Analyze multiple texts in which textual references, such as allusions are present.



VOCABULARY

An **ALLUSION** is a brief and indirect reference to a person, place, thing, or idea of cultural, literary, or political significance. It does not describe in detail the person or thing to which it refers. The writer expects the reader to possess enough knowledge to spot and understand the allusion in a text. For example, “this place is like a Garden of Eden,” would be a Biblical allusion to “paradise” in the Book of Genesis.

TONE is the author’s attitude toward their subject, characters, or audience. Examples of ways to describe Tone: cheerful, sad, magical.

ADDITIONAL HELP AT HOME

- ▶ Work together with your child to discuss any allusions used in movies, T.V. shows, sporting events, or commercials. Keep a running list of those allusions. For example, “That was a herculean effort from the pitcher.”

HELP AT HOME

- ▶ Discuss with your child what each of the following allusions would mean:
 - If you called a boy a “Romeo,” the allusion is to one of Shakespeare’s plays in which a romantic relationship turns into a tragedy for the doomed tragic hero.
 - What if a person said, “I never thought I’d move back to my hometown, but I guess deep down ‘I’m a Dorothy,’” alluding to the “Wizard of Oz” character who learns “there’s no place like home?”
 - What would you expect if I called a certain boy an “Edward?” What about a “Jacob?” “Edward” and “Jacob” both allude to the main characters of the Twilight book and movie series.

Your child can compare and contrast the structure of two or more texts and analyze how the differing structure of each text contributes to its meaning and style.

- Understand how and why writers construct texts using a variety of structures.
- Notice how each choice the author makes affects the style and meaning of the text.



ANALYZING STORY STRUCTURE

To help your child analyze story structure, use the "S.T.O.R.Y." Method:

- S** Identify the **setting**.
- T** Which characters are doing most of the **talking**?
- O** **Oops!** There's a Problem! What is it?
- R** How is the problem **resolved**?
- Y** **Yes!** The problem is solved. How does the story close?

VOCABULARY

CLIFFHANGER is a storytelling strategy where the action in a story ends suddenly at a moment of high excitement, danger, or suspense, leaving the reader eager to know what happens next.

HELP AT HOME

- ▶ To understand how the structure and style of text affect meaning, have your child identify the structure and choice of writing techniques the writer uses in their story. Direct your child to look at details such as how chapter titles tie into the overall theme, how the writer uses the structure of the text to affect the meaning, and how the length and pace of certain chapters connect to the plot.
- ▶ Once your child can identify the structure(s) the writer uses, have them compare and contrast two or more texts with different structures. Tell your child to ask themselves why the writer made specific structural choices and how these choices affect the reader's understanding of a text. For example, why did the author use a cliffhanger at the end of the most exciting chapter? Or, why does one author begin a story with a character having a flashback while another author ends a story with one? How do these choices make connections for the reader?



Your child can analyze how differences in the points of view of the characters and the audience or reader (e.g., created through the use of dramatic irony) create such effects as suspense or humor.

- Understand the role of point of view in a given text.
- Know that point of view is essentially the lens through which the reader is allowed to see the story.



HELP AT HOME

- ▶ Have your child examine one story from a variety of viewpoints. For each different viewpoint, your child should determine what they as the reader knows, different from what the characters know.
- ▶ Instruct your child to rewrite the story (or a part of the story) from the point of view of another character. By becoming the “writer,” your child will see how the technique of point of view creates specific tones and moods in the story.
- ▶ Discuss with your child what makes a particular T.V. show, movie, or play funny or suspenseful. Talk about the effect it has on the viewer when characters know things that the viewers do not. For example, an older family member in a show knows a secret about the past, but the viewers don’t know until the very end.

Your child can analyze the extent to which a filmed or live production of a story or drama stays faithful to or departs from the original text or script, evaluating the choices made by the director or actors.

- Understand how any given literary text can be transformed into and presented in an entirely different form (e.g., film or live performance).
- Understand and be able to explain why the film or live performance may be different from the text version.



HELP AT HOME

► Have your child read a text focusing on the following: How do you picture a certain character or setting? What details in the text make you think about those things?

Then show them the film version of the text or go to a theatrical version of the same story. Have them discuss and record the ways the two presentations were alike and different focusing on the following:

- How was the performance the same or different from the original text? Do the characters and settings look as you pictured them? Why or why not?
- Have some scenes or characters been left out of the performance version? Why would the director of the film/ play make those choices?
- Take note of elements like lighting, staging, costuming, and even casting. How do these decisions affect the quality of the performance and the viewer's ability to grasp the message the author intends?



Your child can analyze how myths, traditional stories, or religious works, such as the Bible, influence themes, patterns of events, or character types in modern works, including how the material is made new.

- Understand the timeless nature of literary themes.
- Explore how the same theme is presented across multiple texts (i.e., many Greek myths seek to explain events in nature).



THEME

Discuss with your child the Disney movies “Toy Story,” “A Bug’s Life,” “Finding Nemo,” and “Cars.” Point out how each of these films centers around the characters who are willing to sacrifice their own wants for those of the people they love. The theme of novels works the same way -- thousands of novels seek to reveal the same theme!

HELP AT HOME

- ▶ Have your child read a variety of texts from different time periods that all focus around a common theme, such as love, friendship, or perseverance. Have your child consider what each author’s overall theme communicates about life, and how the author uses events, conflicts, and/or characters to create that theme. Ask your child to reflect on how recent texts often teach the same “lesson” as older texts yet still stay true to the characteristics of the genre. Your school library media specialist or public librarian are a great source for texts on these themes.
- ▶ Take your child to a movie, play, or musical, and discuss how the message (theme) showed up in the action or events.
- ▶ Discuss different character types who appear in most stories on T.V. or in the movies with your child. For example, who was the hero, the villain, the wise elder, the sidekick, the underdog, or the peacemaker?

By the end of the year, your child can independently and proficiently read and comprehend literature, including stories, dramas, poems, and nonfiction, at the grade 8 complexity level.

- Acquire the habit of reading independently and closely, which is essential to future success.
- Determine when understanding of the meaning of the text is lost and apply strategies to increase understanding when necessary.

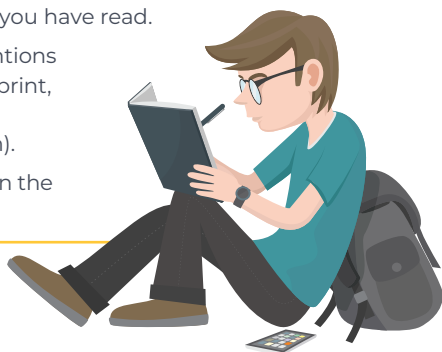
HELP AT HOME

- ▶ Have your child use the “Monitoring and Clarifying Strategy” when reading at home. Ask your child to begin reading the assigned text and use the steps as they encounter difficulties.
- ▶ Encourage your child to read a variety of stories in a variety of forms, such as short stories, novels, graphic novels, or comic books.

MONITORING AND CLARIFYING STRATEGY

Steps for using the “Monitoring and Clarifying Strategy” when reading:

- Stop and think about what you have already read.
- Reread.
- Adjust your reading rate: slow down or speed up.
- Try to connect the text to something you read in another book, what you know about the world, or to something you have experienced.
- Visualize.
- Reflect on what you have read.
- Use print conventions (keywords, bold print, italicized words, and punctuation).
- Notice patterns in the text structure.



Your child can determine an author's point of view and purpose in a text, including the role of particular sentences in developing and refining a key idea.

- Recognize how an author's perspective presents itself within a text.
- Examine a text for overall purpose, personal bias, and opposing viewpoints.

INTERNET RESOURCES



Maryland families can also access a collection of free research databases through the Maryland state library resource center. Scan the QR code to visit the Maryland State Library



Resource Center's Sailor site: Gale in Context for Middle School.

HELP AT HOME

- Locate an online speech given by a historical person. Your school library media specialist or public librarian can help you find an appropriate speech, or you can visit The Maryland State Library Resource Center's Sailor site, in particular the Gale in Context for Middle School. Discuss the speaker's perspective, including: key ideas, supporting details, and counterarguments.
- Ask your child to consider how someone of an opposing viewpoint may respond to the examples, data, or support offered in the original perspective presented. Have your child take note of the speaker's or author's tone, choice of words, and use of persuasive language.

Your child can delineate and evaluate the argument or specific claims in a text, assessing whether the reasoning is sound and the evidence is sufficient. Recognize when unrelated evidence is introduced.

- Dissect the argument presented in a text and analyze the evidence presented.

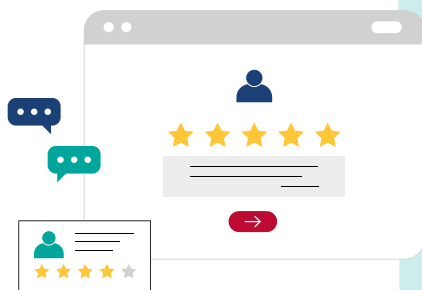
HELP AT HOME

- ▶ Work with your child on analyzing written speeches or political ads by historical individuals. Your school library media specialist or public librarian can help you locate appropriate speeches or political ads. For example, have your child track claims, facts, and evidence presented as support. The notes taken could be used to determine how direct the link is between the speaker's overall claim and a piece of evidence.
- ▶ As your child sorts the evidence and repeats this process with a variety of information, your child may notice and discuss patterns. For instance, your child may recognize that a number of texts cite data without having explained the original study, or speakers use weaker evidence to discredit opposition.



Your child can analyze a case in which two or more texts provide conflicting information on the same topic and identify where the texts disagree on matters of fact or interpretation.

- Understand how two or more texts may present the same topic from differing viewpoints.
- Cite instances of disagreement and analyze the basis for these disagreements.



HELP AT HOME

► Have your child read a variety of reviews for restaurants, attractions, or events. Have them share points on which the reviewers agree and points where they do not agree. Have your child discuss which aspects each reviewer chose to focus on and why their reviews may have been different. For example one reviewer may have focused on how they were treated by staff and another reviewer may focus on the quality of the food.”

Your child can participate in discussions by analyzing and responding to others' ideas and reasoning on grade 8 topics and texts.

- Participate in collaborative discussion one-on-one, in groups, and teacher-led.
- Ask and respond to questions that promote deep exploration of a topic or text.
- Evaluate others' ideas and revise their opinions if necessary.

HELP AT HOME

- ▶ Use "Talk Stems" to have discussions on interesting topics (I think ____ because; I agree with you and ____; Can you say more about ____?; Building on what (Name) said ____; I see things differently. I believe that____, etc.).
- ▶ ● Use Talk Stems to discuss interesting topics in your child's home language.
- ▶ Read about a topic together, then discuss what you both read, referring to pages or examples to support ideas.



Your child can plan and write three main types of writing—papers that argue a viewpoint, reports that explain information, and effective stories—making sure the writing is right for the goal and the reader.

- Argue a point of view using logical organization and a variety of techniques.
- Produce structured, well-developed informative writing with clarity and precision.
- Craft structured, engaging narratives with developed characters and themes.



VOCABULARY

REVISE/REVISION involves taking a piece of writing and making it better by adding new ideas, details, or dialogue, removing parts that are boring or confusing, and rearranging sentences to make the piece flow better.

HELP AT HOME

- ▶ Create a designated writing space that is quiet and includes a desk or table, or even a clipboard, where your child can focus on writing.
- ▶ ■ Remind your child to carefully read each writing assignment looking for what they are being asked to write, who they are writing for (audience), and what the purpose is for this writing piece.
- ▶ Encourage your child to orally share their ideas, tell their stories, and explain their facts before they begin writing.
- ▶ ● Encourage your child to share their ideas, jot notes, or create charts in their home language before writing.
- ▶ Have your child read their writing aloud. This will help them hear the flow of their writing as well as areas to revise.



MATHEMATICS

In eighth grade, your child will expand their understanding of the number system by classifying, estimating and ordering irrational numbers. They will use scientific notation to represent, compare, and reason about very large and very small quantities. Building on their understanding of variables, equivalence, expressions, and equations, they will represent relationships between quantities using systems of equations. They will determine solutions to these systems by graphing or substitution and explain the resulting ordered pair in the context of the problem. Triangles are the geometric focus in 8th grade, understanding the properties of their angles, the characteristics of a unique triangle, and how the Pythagorean Theorem is used to solve problems about right triangles. This year's exploration of relational data sets culminates in the creation of scatterplots, lines of best fit, and understanding how these models can provide the means for making predictions about outcomes.

NUMBER AND OPERATION SENSE

- Identify, order and reason with rational and irrational numbers.
- Use exponents to flexibly manipulate algebraic expressions and solve simple exponential equations involving square roots and cube roots.
- Use scientific notation to express very large and very small numbers.

ALGEBRAIC THINKING

- Express relationships between two quantities by writing systems of linear equations.



ALGEBRAIC THINKING (CONTINUED)

- Solve systems of linear equations by graphing and by substitution.
- Explore the definition of a function and linear function relationships.
- Identify and explain if a given function is linear or non-linear.

GEOMETRIC REASONING & MEASUREMENT

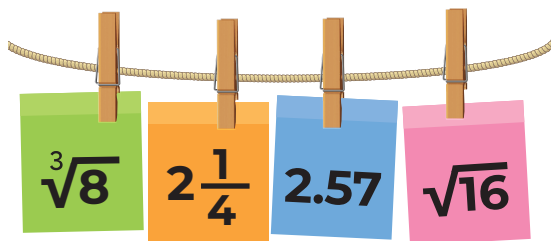
- Explore angle relationships formed by intersecting and parallel lines.
- Use the Pythagorean Theorem to solve problems.
- Identify properties of triangles involving angle measure and congruence.

REASONING WITH DATA, STATISTICS, AND PROBABILITY

- Develop data sets that involve independent and dependent variables that create bi-variate data sets.
- Represent these relationships in scatterplots and find the line of best fit to make predictions.
- Explore compound probabilities by creating a sample space and determining probabilities for their possible outcomes.

Your child can use rational approximations of irrational numbers to estimate their locations on a number line, compare their size, and apply this understanding to estimate the value of expressions in context.

- Find the square and cube roots of numbers.
- Estimate square roots and cube roots to the nearest integer using perfect squares and perfect cubes.
- Compare and order rational and irrational numbers using a number line.
- Use the estimated value of an irrational number to evaluate an expression.



HELP AT HOME

- ▶ Make a clothesline out of string. Write various numbers (e.g., whole, fractions, decimals, square roots, cubed roots) on cards. Let your child put the cards on the clothesline in the correct order from least to greatest.
- ▶ Ask your child which whole number each is closest to on the clothesline.
- ▶ Using a calculator, have your child determine the square root and cube root of numbers. Have them first round the answer to the nearest tenth, then nearest hundredth, and so on.

Your child can know and apply the properties of integer exponents to generate equivalent numerical expressions.

- Write an expression using exponents.
- Evaluate an expression containing exponents.
- Identify patterns when working with exponents to develop associated properties. For instance, $x^2 \cdot x^3 = x \cdot x \cdot x \cdot x \cdot x = x^{2+3} = x^5$
- Multiply and divide expressions with positive and negative exponents.

HELP AT HOME

► Make a set of “Memory Game” cards with exponent expressions on one card and simplified versions on another card. Play “Memory” by challenging your child to find equivalent expressions.

ADDITIONAL HELP AT HOME

Use the properties of exponents to spark a conversation with your child about their origin. For instance (see the 3rd bullet above) and

$$x^4 \cdot x^{-5} = \frac{x^4}{x^5} = \frac{x \cdot x \cdot x \cdot x}{x \cdot x \cdot x \cdot x \cdot x} = \frac{x}{x} \cdot \frac{x}{x} \cdot \frac{x}{x} \cdot \frac{x}{x} \cdot \frac{1}{x} = 1 \cdot 1 \cdot 1 \cdot \frac{1}{x} = \frac{1}{x}$$

so,

$$x^4 \cdot x^{-5} = x^{4+(-5)} = x^{-1} = \frac{1}{x}$$

Your child can apply scientific notation to represent and compare very large and very small quantities in context.

- Express numbers as a single digit times an integer power of ten to estimate and compare size.
- Use scientific notation to model and compute with quantities in context, choose appropriate units and interpret their meaning.
- Use technology to compute with numbers in scientific notation.

HELP AT HOME

- ▶ Use your child's science class resources to locate numbers written in scientific notation. Help them focus on the exponent as the critical piece for identifying magnitude of a number. For instance 2×10^3 and 2×10^6 don't look much different in scientific notation, but their values are very different: 2,000 and 2,000,000!
- ▶ Use an online calculator or your phone to help your child learn how to use it to express numbers in scientific notation with technology and interpret the results of calculations.

VOCABULARY

SCIENTIFIC NOTATION is a compact way to write very large or very small numbers using powers of 10. It helps make numbers easier to read, compare, and calculate with. For example, a population of a city with 500,000 people can be written as 5×10^5 people; a lottery ticket with a 0.00001 chance of winning can be represented as 1×10^{-5} chance of winning.



Your child can solve equations with one variable.

- Solve multi-step equations in which coefficients and constants may be any rational number.
- Determine when an equation has one solution, infinitely many solutions or no solutions.
- Solve an equation with variables on both sides of the equal sign.
- Translate a situation into an equation and solve.

HELP AT HOME

- Give your child equations to solve such as:

$$3x = 9, 2x + 4 = 10,$$

$$5x + 3 = 5x + 7 - 4,$$

$$3x - 1 = 3x + 5,$$

$$\frac{1}{3}x + 7 = 10,$$

$$5(x + 3) = 2(x + 7).$$

Determine how many solutions each equation has (one, infinite or none).

-   If your child is struggling with 'steps' when solving an equation, encourage them to draw a picture to understand the 'balance' of each side of the equal sign:

SYMBOLICALLY

$$5x + 1 = 2x + 7$$

$$\begin{array}{r} -1 \quad -1 \\ \hline \end{array}$$

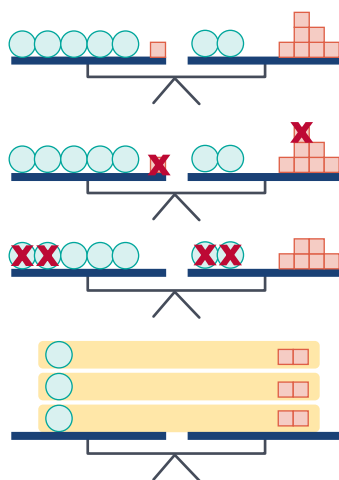
$$5x = 2x + 6$$

$$\begin{array}{r} -2x \quad -2x \\ \hline \end{array}$$

$$\frac{3x}{3} = \frac{6}{3}$$

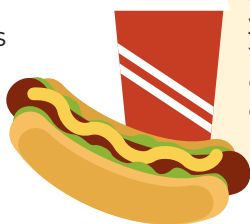
$$x = 2$$

WITH PICTURES



Your child can analyze and solve systems of two linear equations with two variables.

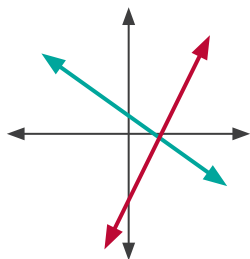
- Graph two equations in a plane and identify the point of intersection of the two lines as the solution to the system.
- Use structure of the equation or the graph to determine when a system has no solution, one solution, or infinitely many solutions.
- Analyze the relationship between the dependent and independent variables in context.
- Interpret solutions to a system of equations in terms of the context.



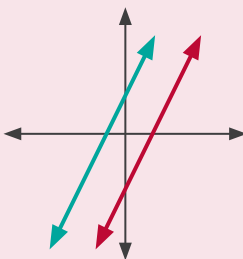
HELP AT HOME

► Have your child solve situations that have two variables. For example: Keith had 3 hot dogs and 2 drinks. He spent \$12. Mary had 2 hot dogs and 4 drinks. She spent \$16. How much was each item? Explain what the x and y values mean in this problem. Have your child graph the two systems in terms of $y = mx + b$, then check the solution on the graph at the point of intersection.

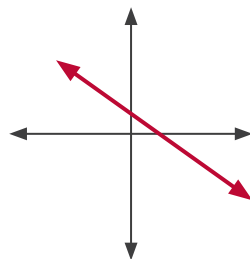
RESOURCES



The graphs intersect at a single point.
There is ONE solution.



The equations have the same slope. The graphs are parallel.
There is NO solution.



The graphs are identical.
There are an INFINITE number of solutions.

Your child can determine whether a relationship is a function by analyzing whether each input is assigned to exactly one output.

- Given a clearly defined set of input/output pairs in a table, a mapping, or a context, determine whether the relationship is a function and why.
- Given a graph, identify input/output pairs and determine whether the graph represents a function.
- Compare properties of two functions, each represented in a different way (algebraically, graphically, numerically in a table or by a description).

CHARGING TABLE

Time charging (Minutes)	0	10	20	30
Video Game Player battery charge (%)	20	32	44	56

HELP AT HOME

- Discuss situations with your child that do and do not create a function:
 - The Charging Table (depicted to the left) represents the charging status of an electronic device.
 - In another situation, our 'input' is the students in your class. The output is your classmate's siblings. If any of your classmates have more than one sibling, then this creates a confusing situation – which sibling applies?

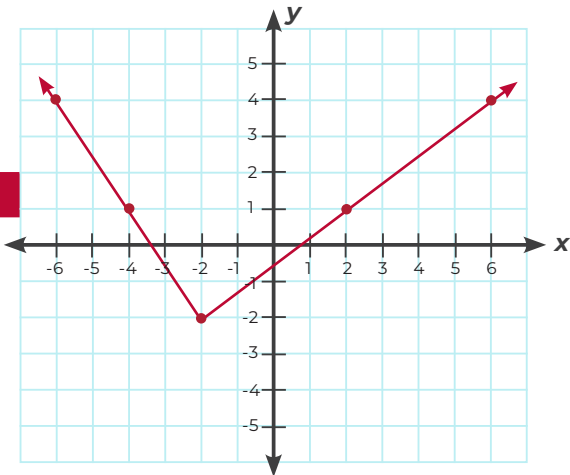
The first situation is a function, the second is not.

RESOURCES

The graph is a **FUNCTION** because all of the **X values** are different.

COORDINATES

(-6, 4) **(-4, 1)** **(2, 1)** **(6, 4)**



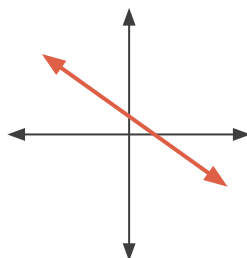
Your child can identify whether a function is linear or non-linear given equations, graphs or input/output pairs, and provide a justification using reasoning about the constant rate of change and its' relationship to proportional reasoning.

- Identify the rate of change between input and output values.
- Provide examples of relationships that are nonlinear functions.
- Create a table of values that can be defined as a nonlinear function.
- Analyze rates of change to determine linear and nonlinear functions.
- Determine rate of change from equations in forms other than the slope-intercept form.

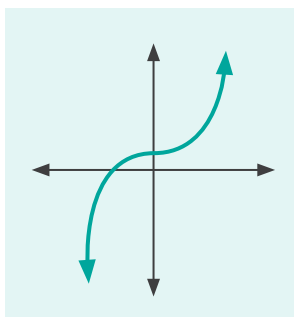
HELP AT HOME

- Encourage your child to use technology to create graphs of equations that are linear, then challenge them to create non-linear graphs. Identify what makes them the same and different. How do the equations differ?

RESOURCES



A **LINEAR GRAPH** forms a straight line, showing a constant rate of change.

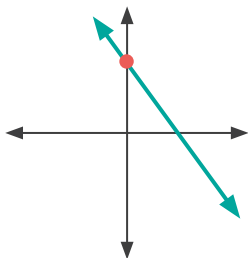


A **NON-LINEAR GRAPH** is curved, wavy, or bent, showing its rate of change fluctuates.

Your child can construct and interpret a linear function to model a relationship between two quantities and interpret the graph of a linear function in the form $y=mx+b$.

- Use variables to represent quantities in context.
- Analyze a variety of function representations such as verbal descriptions, a table of values, an ordered pair, a graph and an equation.
- Interpret the rate of change and initial value in the context of the problem.

RESOURCES



The **Y-INTERCEPT** is the point where the line crosses the vertical y-axis.

HELP AT HOME

- Write real-world situations that involve functions.

For example: Angie bought 6 adult tickets to the movie and 2 children's tickets. She spent \$58. The solution would be $6x + 2y = 58$. Have your child find the rate of change when transformed into

$$y = mx + b \text{ form: } \left(\frac{-1}{-3} \right).$$

Determine the y intercept (29). Then have your child determine various costs for movie tickets (adult \$5, children \$14; adult \$7, children \$8). Last, have your child determine if the equation is a function (yes). Repeat using similar examples.

- ● Use home language to discuss these scenarios. Then, connect to vocabulary in English.

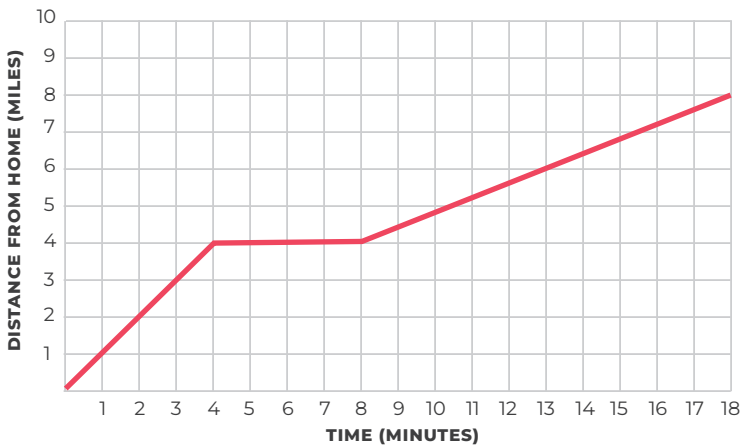


Your child can describe the functional relationship between two quantities by analyzing or sketching a graph that illustrates the features of a function based on a description.

- Match the graph of a function to a given situation.
- Create a graph of a function that describes the relationship between two variables.
- Write a verbal description of the functional relationship between two variables depicted on a graph.

HELP AT HOME

► Create a story problem in which your child will graph the situation. For example: Sam was driving to school. He stopped for a few minutes to get breakfast. He then continued at a slower rate than before until he got to school. Graph Sam's trip.



Your child can explain and support why the sum of the interior angles of a triangle is 180 degrees and why an exterior angle equals the sum of the remote interior angles.

- Construct triangles from three angle measures.
- Construct triangles from three side lengths.
- Determine whether given conditions result in a unique triangle, more than one triangle, or no triangle.
- Use relationships between supplementary, complementary, vertical and adjacent angles to write and solve equations for an unknown angle.

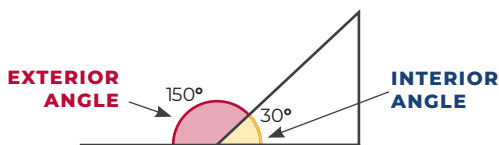
HELP AT HOME

► Cut two congruent triangles. Cut one into three parts. Have your child arrange the cut angles to form a straight line. Notice the measure of the exterior angles is the same as the sum of the two interior angles.

VOCABULARY

CONGRUENT TRIANGLES

Triangles that have the same size and shape.



Your child can apply the Pythagorean Theorem to solve problems in context.

- Determine if a triangle is a right triangle based on the side lengths.
- Find a missing side or hypotenuse length of a right triangle.
- Find the distance between two points in a coordinate system using the Pythagorean Theorem.

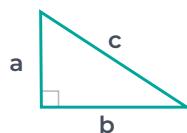
HELP AT HOME

- ▶ Graph two points not on a vertical or horizontal line and ask your child to find the distance between them. Allow your child to reason about an estimate by counting the squares, and suggest drawing a right triangle, with the given segment as the hypotenuse to assist in precision.
- ▶ ▲ Have your child generate their own examples of right triangles and explain why they are right triangles.

RESOURCES

PYTHAGOREAN THEOREM

$$a^2 + b^2 = c^2$$

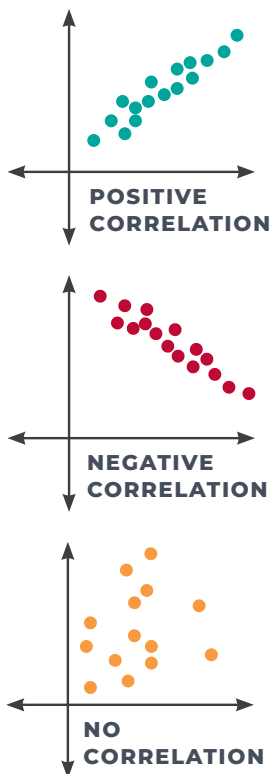


You child can construct and interpret scatterplots for data sets with two variables to investigate patterns of association between the two quantities.

- Describe patterns such as clustering and outliers.
- Determine if a relationship is positive, negative or has no association.
- Distinguish between linear and non-linear associations.

RESOURCES

SAMPLE SCATTER PLOTS AND CORRELATIONS

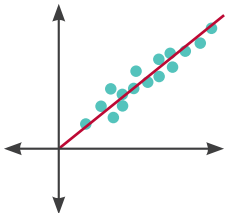


HELP AT HOME

- ▶ ■ Gather some books. Have your child make a scatter plot and compare the number of words on a page (y axis) to the page numbers (x axis). Determine what kind of correlation it is: positive, negative, or no correlation.
- ▶ Have your child make a scatter plot comparing a child's age (x axis) to their height (y axis) and describe the correlation.
- ▶ Have your child make a scatter plot comparing the amount of money you have when you begin shopping (y axis) to the time spent shopping (x axis). Then have them describe the correlation.
- ▶ ● Use home language to discuss graphs and vocabulary first. Then connect the discussion to the vocabulary in English.
- ▶ ▲ Have your child make a scatter plot with two variables they are interested in comparing.

Your child can use a provided linear model to make predictions based on a set of data with two variables (bivariate).

- Interpret the meaning of the slope and y-intercept in the context of the problem.
- Determine the equation of the line of best fit for a scatterplot.



HELP AT HOME

► Using the scatterplots from the previous Help at Home activity, have your child determine the line of best fit for the data. Have your child determine slope of each line and apply this answer to the data by describing what the slope represents in context.

Your child can construct a two-way table to organize data for two variables.

- Create a two-way table to record the frequencies of bivariate categorical values.
- Compute marginal sums or marginal percentages.
- Determine the relative frequencies for rows and/or columns of a two-way table.
- Use the relative frequencies and context of the problem to describe possible associations between the two sets of data.

HELP AT HOME

► Have your child collect data that compares the ice cream flavor preferences (vanilla, chocolate, strawberry) of adults vs. children. Organize the data in a two-way table, then determine the relative frequency of each by dividing the row amount by the total column amount.



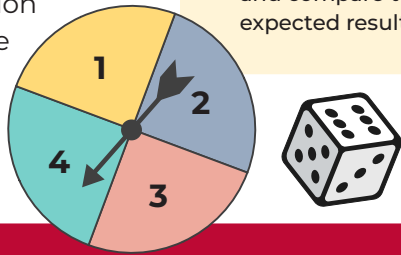
	Vanilla	Chocolate	Strawberry	Total
Adults	5	10	2	17
Children	15	21	9	45
Total	20	31	11	62

Your child can find probabilities of compound events by representing or simulating the sample space or events.

- Represent a sample space for a compound event using organized lists, tables or tree diagrams.
- Identify the number of possible outcomes given the representation created.
- Determine the probability of a compound event as a fraction of the total outcomes in the sample space.

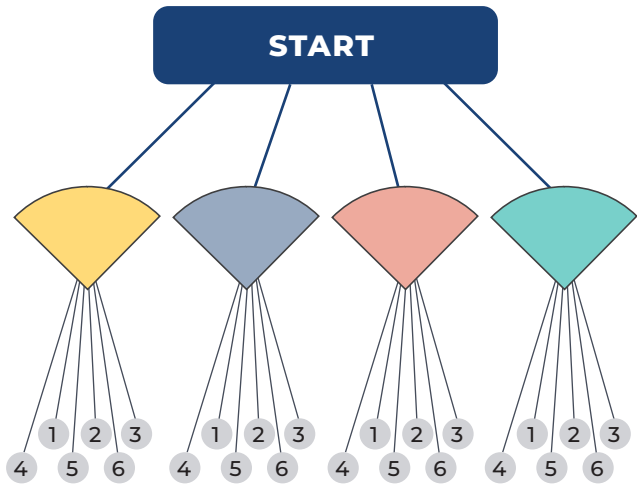
HELP AT HOME

- Use a spinner and a die to determine the total number of outcomes possible if the spinner is spun once, and then the die is tossed.
- Have your child run a simulation (using technology or an actual spinner and die) to collect data and compare to the expected results.



RESOURCES

SAMPLE TREE DIAGRAM





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