

Math at Home Recommendations ([Español](#))

Note: The Free Library of Philadelphia offers free internet and computer use to city residents. Find your local branch [here](#). [Here](#) is a great blog post with links to Math Resources for Caregivers authored by the Team at Illustrative Mathematics.

Students in <u>Grades K-2</u>		
Math Concept	Activity Description	Resources and Materials
Numbers & Operations	Card Games: These 10 card games are organized from basic to more advanced early math skills. Game 1 is the simplest and Game 10 is the most difficult.	Family Card Games Card Game Stories Other card games
All	DREME Math Snacks There are many opportunities for families to engage in early math in their daily routines. DREME Math Snacks inspire families to find and talk about math in everyday life. Like any healthy snack, Math Snacks are quick, easy, highly shareable, and perfect for any time of day.	Math Snacks
Counting, Measuring, Adding & Subtracting	The Math of Cooking When families cook and prepare food, they naturally count, measure, and work with numbers. These recipes offer tips to help parents and caregivers talk about math while cooking with their children. Each recipe has a different math focus: counting, measuring, or adding and subtracting. The math tips can be used when preparing almost any food, not just these recipes.	Recipes
All	Love Maths includes a collection of games that support students with a variety of skills and concepts. If you click “Foundation-Year 2” you will find games that utilize a variety of commonly found household items to play with your children. There are also videos for each game so you can see how it is played.	Games
All	Bedtime Math is a free app that sends parents a fun, new math problem every day, on everything from electric eels and chocolate chips to roller coasters and flamingoes. Targeted for kids ages 3-9, it begins with a short, fun set-up story, followed by three math problems at three levels of challenge.	Bedtime Math

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Number and Operations	<u>Shake & Spill</u> (This is a fun game that is part of our Illustrative Mathematics program!) 1. Student and caring adult decide how many objects they want to use a. Up to 5 (Kindergarten) b. Up to 10 (Kindergarten, Grade 1) c. Up to 20 (Grade 1, Grade 2) 2. The student closes their eyes while the family/community member covers up some of the objects with a cup (upside-down). 3. The student opens their eyes and determines how many objects are under the cup and explains how they know. 4. The student and adult switch roles and repeat steps 1-3.	● Cup ● Up to 20 objects that can be covered under a cup: ● Paper clips ● Dried beans
Counting, Geometry	<u>Picture Books</u> (This is a fun game that is part of our Illustrative Mathematics program!) While reading any picture book together, families can engage with the story with a mathematical lens by doing the following: 1. Students look at picture books and identify groups of objects. They may recognize small quantities or count to figure out how many. 2. Students look through picture books and notice and describe shapes they see in the pictures. (Students may record the shapes they see with drawings or words.)	Any picture book students and families and community members read over the summer
Counting Collection	<u>Counting Collections</u> (This is a fun game that is part of our Illustrative Mathematics program!) Students count a collection of objects and represent how they counted. 1. Students are given a collection of objects. ○ The collection of objects can be up to 20 (Kindergarten), 99 (Grade 1) or 120 (Grade 20) based on a student's grade level. 2. Students figure out how many objects are in their collection ○ Ask students to explain how they counted ○ Encourage students to see the structure of: ■ 5 and some more ■ 10 and some more ■ Hundred, tens, and ones ○ Encourage students to think about how to keep track of their counting 3. Students may draw pictures or write numbers to represent their collection. *Variation: Before students count, they can estimate how many objects they think are in the collection.	Any objects at home that students can count: ● Paper clips ● Dried beans ● Pencils ● Toys ● etc

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All	We always want students to continue to be curious about mathematics. We want them to see and talk about their math ideas. Talking Math, from Illustrative Mathematics, is a collection of tasks that are a fun start to conversations about math with your children. The prompts, for grades K-5, anchor on one image. The images were chosen to allow a lot of noticing, wondering, and asking questions, while at the same time providing a related question aligned to the different grade levels.	Talking Math
Students in <u>Grades 3-5</u>		
Math Concept	Activity Description	Resources and Materials
All	<u>Love Maths</u> includes a collection of games that support students with a variety of skills and concepts. If you click “Year 3-Year 6” you will find games that utilize a variety of commonly found household items to play with your children. There are also videos for each game so you can see how it is played.	Games
Multiplication in everyday situations	<u>Multiplication Hunt</u> - Look for items around the house or at the grocery store that come in equal groups (e.g., eggs, boxes of cereal bars, packages of toilet paper, cans of soda, packages of juice boxes, etc.). - Ask each other questions about how many you would have if you bought a certain number of packages (If someone buys 4 packages of juice boxes, how many juice boxes do they buy?)	More ideas for math at the supermarket
Multiplication fact fluency	<u>How Close?</u> (This is a fun game that is part of our Illustrative Mathematics program!) - Use a regular deck of cards, with face cards removed. Aces count as the number 1. (If you don’t have cards you can use dice instead.) - On your turn, take 4 cards (or roll a die 4 times and record the numbers you roll). - Choose 2-3 of your numbers to multiply. - Write an equation to show the product of the numbers you chose. - Your score for the round is the difference between your product and 100. - At the end of the game, add your scores for each round. The lowest score wins!	How Close? Recording Sheet (if you do not have access to a printer, you can write it on any sheet of paper) See an example of Rounds 1 and 2 for one player here .

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Multiplication fact fluency	<u>The Product Game</u> • Use the link to play this online game • Play against each other • Or play against the computer	Product Game
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Multiplication fact fluency	<u>Multiplication War</u> • Use a regular deck of cards, with face cards removed. Aces count as the number 1. • Place the deck face down. • Each player takes 2 cards and multiplies to find the product of the 2 numbers shown on the card. • Players compare products. The player with the highest product takes all the cards from that round. Whoever has the most cards at the end of the game wins.	Example of Multiplication War
Fractions in everyday situations	Look for fractions in everyday life. Recipes are a great place to look! Any time you share food among the family, talk about what fraction each person will eat.	More ideas for working with fractions at home
Fractional Reasoning	<u>Make One</u> • Use a regular deck of cards, with the face cards removed. Aces count as the number 1. Place the deck face down. • Each player draws 4 cards • Each player uses the 4 cards to make two fractions • Your objective is to make two fractions that add up to one whole • When it is your turn, draw the top card from the face-down deck. You may decide to keep it or discard it. If you keep it, discard one of your cards. • The winner is the first player to make two fractions that add up to one whole.	Example of Make One You can use these virtual fraction strips to help: Fraction Strips

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Multi-digit Addition	Target Numbers (This is another fun game from Illustrative Mathematics!) • This game uses three regular dice. If you only have one die, that's okay! If you don't have any dice you could use playing cards instead; just remove the face cards and 10s, aces would be the number 1. • Roll 3 number cubes (dice) to get a starting number for both partners. If you only have 1 die, just roll it three times and record the numbers to make your starting 3-digit number. • On your turn: ○ Roll 3 number cubes (or roll one number cube 3 times). For each cube, decide whether it represents hundreds, tens, or ones that you will add to your starting number. ○ Write an equation to represent the sum. • Take turns until you've played 6 rounds. • In each round, the sum from the previous equation is the starting number in the new equation. • The partner to get a sum closest to 1,000 without going over wins.	Target Numbers Recording Sheet (if you do not have access to a printer, you can write it on any sheet of paper) See an example of rounds 1 and 2 for one player here.
Students in <u>Grades 6-8</u>		
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All	Love Maths includes a collection of games that support students with a variety of skills and concepts. If you click "Year 3-Year 6" you will find games that utilize a variety of commonly found household items to play with your children. There are also videos for each game so you can see how it is played.	Games

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Multiplying Fractions	Rolling for Fractions (A game from Illustrative Mathematics) - This game uses 4 regular dice (number cubes). If you only have one die, that's okay! If you don't have any dice you could use digital dice or playing cards instead; just remove the face cards and 10s and aces would be the number 1. - Each partner: - Roll 4 number cubes (dice). Use the numbers to complete the expression and write the product. - Check your partner's work to make sure you agree. - Determine the number of points each partner gets: 5 points for the largest product 3 points for the smallest product - Repeat for the next round. The partner who has the most points once the recording sheet is full wins the game	Rolling for Fractions Recording Sheet (if you do not have access to a printer, you can write it on any sheet of paper)
Multiplication fact fluency	<u>The Product Game</u> - Use the link to play this online game - Play against each other - Or play against the computer	Product Game
Data	When watching TV, reading a newspaper, or using social media and you see a chart or graph, talk with your child about the variables in the chart, how the data was collected, and what the data means.	If graphs do not show up in your life, you can find more graphs here. Spurious Correlations allows students to see why correlation does not necessarily mean causation. The website is great for middle/high schoolers to learn about data and relationships between quantities.
Mixed Challenges and Puzzles	A math challenge game board for students to complete during their summer break (or in the classroom), using the online games and books at TangMath.com. There are 4 game boards for students who have finished 6th grade linked on the site (levels 7-10), but students can work through the previous levels as needed. You do not need to submit game boards to participate.	Summer Challenge

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Positive and Negative Numbers	Create a list of numbers and then order them from least to greatest. Make sure to have discussions around why you are ordering them that way and what the numbers could represent if you didn't take them from a real-world scenario. To increase spatial awareness you could co-create a number line to order them. Numbers can be whole numbers, fractions, and decimals.	Example of this activity Online game extension of this task. It's recommended that you play together on the same computer so it becomes interactive and there's discussion around the math.
Unit Rate	Before or during grocery shopping, create your shopping lists with your child. Look for better buys by comparing the "price per oz", "price per lb.", "price per unit", etc. If you aren't comparing the product to another one, you can simply ask your child to tell you about the cost per item/unit of measure.	Example of this activity
Algebraic Thinking	Use logic to solve visual, interactive mathematical puzzles. Play and even build SolveMe Mobiles together. As you do this together, discuss ways you solved it and make sure to get creative as there isn't just one way to figure it out.	SolveMe Mobiles
Integer Product Game	<u>Integer Product Game</u> (7th grade and up) • Use the link to play this online game • This is a two-person game • Players take turns changing a factor on the Factor List to create products. The resulting product is marked with the player's color. If the product is already highlighted, the player loses a turn. • The first player to have four spaces in a row highlighted in their color (up and down, across, or diagonally) is the winner!	Integer Product Game

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3D shapes	Exploring the properties of three-dimensional shapes is fun for all ages! If you can print on stock paper and not regular paper, it makes them sturdier. After printing, simply cut out the 3d shape nets on the solid lines. Have them label the different parts of the shape (face, edge, base) before assembling. Then, carefully fold each tab so that it can be used to glue the shape together, and fold each side of the shape. Finally, glue or tape shapes together. Once they are made you can: • Discuss math vocabulary such as polyhedron, face, edge, prism, etc. • Compare the shapes by counting the number of faces and edges or other characteristics • Use them to go on a 3D shape hunt: find the shapes in real-life	Geometric Nets For 3D Shapes: Printable Pack Cube Nets Geometric Solids
Percentages	Collect news clippings that mention percentages and sort them according to whether they are about percent increase or percent decrease, and formulate questions about them.	Example: Stocks in the stock market and how their values change
Students in Grades 9-12		
Math Concept	Activity Description	Resources and Materials
History of Mathematics	<u>The Man Who Knew Infinity</u>: This movie is based on the biography of the life of groundbreaking mathematician S. Ramanujan	Various streaming services including but not limited to Prime Video or YouTube
Algebraic Thinking	Students can practice using algebra by calculating the price of road trips (via car or public transit). Ex: I'm driving to the beach this weekend with my cousin. It's a 70-mile trip. My car gets 30 mpg and my cousin gave me \$10 to pay for gas. The local Sunoco is selling gas for \$3.80/gallon. Did my cousin give me enough money?	Gas Station Prices (can Google)
Pattern Investigation	Students will discover the mathematical connection between the human body and the shell of a snail	The Golden Ratio

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Math of the Olympics	With the Summer Olympics in Paris happening this summer, students could engage in thinking about the math of the Olympics. This resource offers lots of ideas for how to think about the math of the Olympics.	Math Meets Sports: How Is Math Used in the Summer and Winter Games?
Systems of Linear Equations	Play Sudoku by solving equations and systems of equations	Simultaneous Equations Sudoku
History of Mathematics, Recreational, Thinking Mathematically	There are lots of great books you can buy or find in your local library students and families can read to learn more about math. Check out the list provided. There are also lots of math podcasts you can listen to. Why not try BBC's More or Less podcast Numberphile 's videos and podcasts?	List of Books
Functions and Graphs	Students use this activity to match different functions (linear, quadratic, exponential, trigonometric, and cube root) to real-world physical situations.	What's That Graph?
Data, Relationships between variables, and Correlation	The website, Spurious Correlations, allows students to see why correlation does not necessarily mean causation. The website is great for all grades (middle and high school) where students learn about data and relationships between quantities.	Spurious Correlations