A black background with a black square

Description automatically generated with medium confidenceMath Glossary

**Key Terms**



**What to do:** Use this glossary to familiarize yourself with math terms you may have heard but aren’t completely familiar with. Refer to it as needed when you communicate with school-day math teachers about student needs and concerns.

**Why it matters:** Understanding the terminology can reduce your anxiety, help you communicate more effectively, and be more successful when working with students.

This glossary would be huge if it included every math-related term that exists! So, this includes just a sample of terms you might hear if you talk with math teachers. It also includes terms related to math anxiety.

**Tips for Expanding Your Math Vocabulary and Understanding**

Talk with a math teacher.

Look in a dictionary or textbook.

Check reputable online sources. For example, see the Common Core State Standards Initiative Math Glossary at <https://www.thecorestandards.org/Math/Content/mathematics-glossary/>.

**100 chart:**A 10-by-10 grid with the numbers 1 to 100 printed in the squares.

**Adaptive reasoning:** The capacity for logical thought, reflection, explanation, and justification; one of the National Research Council’s five strands of mathematical proficiency.

**Algebra:** A branch of mathematics that deals with symbols or variables and uses arithmetic operations (+, –, ×, ÷) to find the unknown quantities represented by these variables.

**Algebraic thinking:** Particular ways of thinking, including analyzing relationships between quantities, noticing structure, studying change, generalizing, problem solving, modeling, justifying, proving, and predicting.

**Anxious reappraisal:** An anxiety management strategy where you tell yourself you’re “excited” instead of “anxious” whenever you feel nervous. Researchers say it works because anxiety and excitement are similar; in both cases, the heart beats faster and the hypothalamus releases cortisol (the “fight or flight” hormone). The difference? Anxiety is a negative emotion that increases awareness of potential threats while excitement is a positive emotion that increases awareness of opportunities.

**Arithmetic:** A branch of mathematics that deals with the properties and manipulation of numbers.

Graphical user interface

Description automatically generated**Array:** A visual arrangement of objects in rows and columns. Math teachers use arrays to help students visualize numbers and operations, like addition, subtraction, multiplication, and division.

**Calculus:** A branch of mathematics that deals with the study of rates of change.

**Conceptual understanding:** An integrated and functional grasp of mathematical ideas that enables students to learn new ideas by connecting them to what they already know. Conceptual understanding supports retention and prevents common errors. It’s one of the National Research Council’s five strands of mathematical proficiency.

**Embedded instruction:** Providing opportunities for students to learn or practice a **math concept or skill** or a **learning strategy** in the context of an academic enrichment activity. Embedded instruction can be interdisciplinary and fits well in out-of-school time environments.

**Explicit instruction:** Direct teaching of **math concepts and skills** as well as **learning strategies** such as visual representations, verbalization of thought processes, reflection on problem-solving strategies, and interleaving — alternating between different types of math problems, which improves learning and retention.

**Fibonacci Sequence:** A set of whole numbers formed by adding the last two numbers to get the next number in the sequence: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, and so on. Also known as the Golden Ratio. Examples may be found in the petals of flowers like lilies, daisies, and sunflowers; the spiral shapes of shells, galaxies, weather patterns, and animal flight patterns; faces, bodies, and DNA.

**Fractal:** A geometric shape that repeats with a complex structure. Examples found in nature are snowflakes, ferns, pine cones, pineapples, and branching trees.

**Geometry:** A branch of mathematics that deals with the measurement, properties, and relationships of points, lines, angles, surfaces, and solids.

**Graphing calculator:** An advanced calculator that can solve equations, plot graphs, and perform other tasks with variables.

**Growth mindset:** The belief that one’s skills, character, intelligence, and creative ability can be developed with practice over time. Opposite of “fixed mindset.”

**Interleaving:** A study strategy where you alternate between two or more related concepts or skills instead of focusing on only one at a time. For example, instead of doing addition problems first, then multiplication problems, you’d go back and forth. This strategy can help learning and retention.

**Math MUSTs:** A set of ideas and strategies to help dispel myths, fears, and stereotypes about math and your ability to learn it. “MUST” is an acronym for **m**essages, **u**nderstanding, **s**kills, and **t**hrills. **Note:** This term is specific to the 21st CCLC NTAC Math Toolkit.

**Mathematics:** The study and use of numbers and their operations to describe, measure, predict, and explain occurrences and relationships in the physical world. Branches of mathematics include algebra, arithmetic, calculus, geometry, and trigonometry.

**Math anxiety:** Feelings of tension, apprehension, and fear of situations involving math, regardless of one’s math ability.

**Math circle:** A meeting of K-12 students or teachers to work on problem solving. The lead instructor or facilitator may be a university professor, graduate student, or someone else who is knowledgeable and passionate about math.

**Math talk:** A structured format in which students are supported as they discuss their problem-solving strategies, the reasoning behind their work, questions they may have, and observations about different math approaches and applications.

**Mental math:** The use of various skills and strategies to do math in your head, without pencil and paper or a calculator. Skills that help you do mental math are being able to recall math facts, estimating, and rounding. Strategies include breaking problems down into steps or breaking numbers down into their components. For example, to add 43 and 52, you could add 40 and 50 to get 90, add 3 and 2 to get 5, then add 90 and 5 to get the answer: 95.

**Metacognition:** This literally means “thinking about thinking.” It’s the ability to examine how you process thoughts and feelings, which leads to greater awareness of how you think and learn.

**Mindfulness development:** Development of skills that promote a state of active, open attention on the present. A framework for the practice of social and emotional learning.

**Number bonds:** Pairs of numbers that you can add to make another number. For example, number bonds for 5 are 1 + 4 and 2 + 3.

**Number line:** A line on which numbers are marked at intervals. On a number line, any numbers to the right of the zero are positive, and any numbers to the left of the zero are negative. Rulers and thermometers are examples of number lines.

**Number sense:** The ability to understand, connect, and relate numbers. Examples are understanding quantities and making comparisons.

**Number talk:** A short, structured activity where the teacher poses an addition or multiplication problem (like 95 + 95 or 19 x 5), asks students to solve it in their heads, then asks them to share how they did it. Students practice mental math, learn about different problem-solving approaches, rehearse math facts, and develop number sense.

**Order of operations:** A set of rules for the sequence you follow to solve a math expression: (1) perform all operations inside parentheses, brackets, and/or above and below a fraction bar in the order specified in steps 3 and 4; (2) find the value of any powers or roots; (3) multiply and divide from left to right; (4) add and subtract from left to right.

**Pi:** The ratio between the circumference of a circle and its diameter. As a fraction, it’s expressed as 22 over 7, but the actual number is unknowable. To find the area of a circle, multiply Pi by the radius squared.

**Pomodoro technique:** A time management strategy to overcome procrastination and make a task seem less overwhelming. To use this technique, set a timer and work on a task for 25 minutes, take a 5-minute break, and do another 25 minutes. After four times, take a longer break (20 or 30 minutes).

**Problem solving:** Applying your math knowledge, skills, and understanding, along with critical thinking and creativity, to solve a problem.

**Procedural fluency:** Skill in carrying out mathematical procedures flexibly, accurately, efficiently, and appropriately. It’s one of the National Research Council’s five strands of mathematical proficiency.

**Productive disposition:** The inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one’s own efficacy. It’s one of the National Research Council’s five strands of mathematical proficiency.

**Productive struggle:** The level of effort required to successfully complete a task that’s in the “sweet spot” of being neither too easy nor too hard to achieve. Sometimes called *beneficial difficulty* or *zone of proximal development*. This kind of struggle, followed by success, produces new understandings and confidence.

**Self-talk:** Internal dialogue; studies show negative and positive self-talk can affect one’s psychological state, performance, and sense of well-being.

**Strategic competence:** The ability to formulate, represent, and solve mathematical problems. It’s one of the National Research Council’s five strands of mathematical proficiency.

**Sweet spot:** A level of difficulty that engages students in productive struggle by providing a task that’s neither too hard nor too easy, but “doable” with effort and the right conditions (e.g., sufficient time) or supports (e.g., a calculator), depending on the task. Also called the *zone of proximal development*.

**Trigonometry:** A branch of mathematics; a subset of geometry that’s concerned with the length, height, and angles of a triangle.

**Universal design for learning:** A framework, based on brain science and evidence-based practices, that guides the design of learning experiences to proactively meet the needs of all learners.

**Variable:** In math, a variable is a symbol or letter (like *x* or *y*) that represents a value you don’t know yet. Variables can be *dependent* (which means their value depends on other variables) or *independent* (which means their value doesn’t change even if other variables change).

*Arithmetic is being able to count up to twenty  
without taking off your shoes.*

—**Mickey Mouse**

A white rectangular frame with purple border

Description automatically generated

This resource was developed in 2024 by the Nita M. Lowey 21st Century Community Learning Centers (21stCCLC) National Technical Assistance Center (NTAC), funded under a grant from the U.S. Department of Education (Department) and administered by Synergy Enterprises, Inc. under Cooperative Agreement No. 287E230009 with the Department’s Office of Elementary and Secondary Education. Opinions expressed herein do not necessarily reflect the position or policy of the Department, nor does mention of trade names, commercial products, or organizations imply endorsement by the Department or the federal government. This resource is in the public domain and is available at [21stcclcntac.org](http://www.21stcclcntac.org). Authorization to reproduce it in whole or in part is granted.