Glossary of Verbs Associated with New York State Math Standards

Key vocabulary was identified and recommended to be defined in a glossary of verbs associated with the mathematics standards. This glossary contains a list of verbs that appear throughout the Revised Standards Recommendations. These verbs are explained in the context in which they appear in the Revised Standards Recommendations.

Word	Intent when used in the standards
Analyze	*Analyze* requires students to examine carefully, take apart mathematically, and break down into components or essential characteristics to identify causes, key factors, and possible results.
Apply	*Apply* requires a student to use mathematical knowledge in a variety of situations.
Calculate	*Calculate* requires a student to determine an answer.
Classify	Students *classify* by determining characteristics (attributes) that objects (numbers, shapes, etc.) share, and characteristics (attributes) they don't share.
Compare	Students *compare* by examining two or more objects, numbers or mathematical situations in order to determine similarities and differences.
Compose	*Compose* requires students to form or make something (numbers, functions, sets, etc.) by combining parts.
Convert	Students *convert* by changing the form (e.g. measurement, different units) without a change in the size or amount.
Decompose	Students *decompose* by separating into parts in terms of simpler components that allows for students to see groupings, relationships and patterns.

Demonstrate	Students *demonstrate* understanding and application of the content in the standard through narrative (oral or written), modeling (including pictures, diagrams or technology), algebraic work or any mathematically appropriate method that clearly communicates the steps leading to the solution or conclusion needed.
Derive	*Derive* requires the student to utilize current or specified knowledge to formulate a “new” theorem, formula or relationship.
Describe	*Describe* requires that students illustrate their thinking or justifications through verbal (oral or written) statements that may reference a drawing/diagram/model.
Determine	To *determine* requires finding something out or establishing exactly, typically as a result of research or calculation.
Develop	*Develop* requires a student to engage in experimentation or argumentation that leads to a mathematically appropriate conclusion.
Differentiate	*Differentiate* requires a student to determine the difference between two or more things.
Distinguish	*Distinguish* requires students to recognize distinct or different characteristics (attributes).
Explain	*Explain* requires a student to provide verbal (oral or written) evidence to support a conclusion or solution.
Explore	*Explore* requires the student to learn the concept in the standard through a variety of instructional activities. Repeated experiences with these concepts, with immersion in the concrete, are vital. *Explore* indicates that the topic is an important concept that builds the foundation for progression toward mastery in later grades. However, mastery at the current level is not expected for that standard.
Express	*Express* requires students to change an amount or quantity into a different form.

Find	*Find* requires a student to calculate a specified value.
Fluency	The word *fluent* is used in the Standards to mean "fast and accurate." Fluency in each grade involves a mixture of just knowing some answers, knowing some answers from patterns and knowing some answers from the use of strategies. See page 18-19 of https://commoncoretools.files.wordpress.com/2011/05/ccss_progression_cc_oa_k5_2011_05_302.pdf Procedural skills and fluency: The standards call for speed and accuracy in calculation. Students must practice core functions, such as single-digit multiplication, in order to have access to more complex concepts and procedures. Fluency must be addressed in the classroom or through supporting materials, as some students might require more practice than others. http://www.corestandards.org/other-resources/key-shifts-in-mathematics/ Required Grade Level Fluencies for K-8 https://www.engageny.org/sites/default/files/resource/attachments/ccssfluencies.pdf High School Fluencies for each course can be found at the end of the course overviews located at https://www.engageny.org/resource/grades-9-12-mathematics-curriculum-map-and-course-overviews
Generate	*Generate* requires students to create something by the application of one or more mathematical rules or operations.
Identify	*Identify* requires students to recognize a mathematical concept using prior knowledge.
Interpret	*Interpret* requires students to make sense of and assign meaning to a mathematical task and explain the reasoning behind it.
Justify	*Justify* requires a student to show evidence and/or steps that illustrate the mathematics leading to a solution or conclusion. *Note: Words are acceptable but not necessary.*

Know	*Know* requires students have a firm mathematical understanding through awareness of situations, facts, information, and skills.
Make	*Make* requires a student to create a picture, diagram or model to illustrate a mathematical concept.
Prove	*Prove* requires students to demonstrate that an argument is universally true where each step and conclusion must be supported by evidence and/or reasoning. This can be shown through a variety of strategies.
Recognize	*Recognize* requires students to identify mathematical concepts based on previous facts or knowledge.
Reference	*Reference* requires students to apply a specified mathematical concept.
Represent	*Represent* requires students to communicate a mathematical concept through pictures, diagrams, models, symbols, or algebraic notation.
Solve	*Solve* requires the students to find the answer to specified problem.
Specify	*Specify* requires the student to clearly articulate or describe mathematical properties or procedures.
State	*State* requires students to give an answer without calculations or underlying work.
Understand	*Understand* requires a student to grasp sufficient knowledge of a mathematical concept in order to explain or apply it. Expectations that begin with the word "understand" are often especially good opportunities to connect the practices (Standards of Mathematical Practice) to the content. Students who lack understanding of a topic may rely on procedures too heavily. Without a flexible base from which to work, they may be less likely to consider analogous problems, represent problems coherently, justify conclusions, apply the mathematics to practical situations, use technology mindfully to work with the mathematics, explain the mathematics accurately to other students, step back for an overview, or deviate from a known procedure to find a shortcut. http://www.corestandards.org/Math/Practice/
Use	*Use* requires the student to apply designated processes, strategies or mathematical concepts.

Verify	*Verify* requires students demonstrate that a mathematical concept is true or accurate.
Written Method	A *written method* is any way of representing a strategy using pictures or numbers.