Glossary of Verbs Associated with the New York State Next Generation Mathematics Learning Standards

Key vocabulary was identified to be defined in a glossary of verbs associated with the New York State Next Generation Mathematics Learning Standards. This glossary contains a list of verbs that appear throughout the Mathematics Standards and are explained in the context in which they are used.

Word	Definition/context of use 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).
Evaluate	*Evaluate* requires that a student find the value of a mathematical expression.
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.
Fluent	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. For additional information refer to pages 18-19 of Progressions for the Common Core State Standards in Mathematics (draft) *Principles and Standards for School Mathematics* states, "Computational fluency refers to having efficient and accurate methods for computing. Students exhibit computational fluency when they demonstrate *flexibility* in the computational methods they choose, *understand* and can explain these methods, and produce accurate answers *efficiently*. Required Grade Level Fluencies for Grades K-8: Required grade level fluencies are available from EngageNY at Required Fluencies for Grades K-8 Standards for Mathematics. Standards that are recommended fluencies at the High School level are identified in each set of standards for Algebra I, Algebra II and Geometry.
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.

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/ Representation	A *written method/representation* is any way of representing a strategy using words, pictures or numbers.