



Primary Grades Instructional Data

COGNITIVE VERBS TERMS AND DEFINITIONS

for the Web-based MAP[®] system

Cognitive Verbs	2
Mathematical Cognitive Verbs	2
Reading Cognitive Verbs	8
Notes	14

Measures of Academic Progress, MAP, and DesCartes: A Continuum of Learning are registered trademarks of NWEA in the United States or other countries. The names of other companies and their products mentioned in this documentation are the trademarks of their respective owners.

© 2010-2013 Northwest Evaluation Association, 121 NW Everett St, Portland, OR 97209

Telephone: 503-624-1951 ♦ FAX: 503-639-7873

Cognitive Verbs

The *Primary Grades Instructional Data* (PGID) statements contain specific words to reflect the content and skills, cognitive rigor, and the context of the test question. The verbs that appear in the PGID statements represent the cognitive rigor within the test question.

This document contains cognitive verbs for both NWEA Standard and Common Core.

Mathematical Cognitive Verbs

The following chart, based on the revised Bloom's Taxonomy,¹ correlates the verbs used in PGID statements for mathematical concepts to each cognitive process dimension.²

Table 1: NWEA Standard Cognitive Verb Correlations—Mathematics

	REMEMBER	UNDERSTAND	APPLY	ANALYZE
Problem Solving		Represents	Applies Determines	Analyzes Selects Solves
Number Sense	Counts Counts on Identifies Recognizes	Compares Interprets Orders Represents Sorts Understands	Rounds	Composes/ Decomposes
Computation			Determines Estimates	Solves
Measurement and Geometry	Identifies Names	Classifies Compares Explains Finds Illustrates Infers Matches Orders Reads Represents Sorts Understands	Determines Estimates Measures	Selects Solves
Statistics and Probability	Identifies	Exemplifies Finds Illustrates Infers Interprets Orders Predicts Represents Sorts Summarizes Understands	Applies Determines	Selects
Algebra		Explains Illustrates Infers Interprets	Applies Determines Extends	Selects Solves

	REMEMBER	UNDERSTAND	APPLY	ANALYZE
		Matches Represents Understands		

Table 2: Common Core Cognitive Verb Correlations—Mathematics

	REMEMBER	UNDERSTAND	APPLY	ANALYZE
Operations and Algebraic Thinking	Identifies	Infers Matches Represents Sorts Understands	Applies Determines	Selects Solves
Number and Operations	Counts Counts on Identifies Recognizes	Compares Illustrates Interprets Orders Represents Understands	Determines Rounds	Composes/ Decomposes Solves
Measurement and Data	Identifies	Classifies Compares Finds Infers Interprets Matches Orders Reads Represents Sorts Summarizes Understands	Determines Estimates Measures	Solves
Geometry	Identifies Names	Classifies Compares Matches Represents Sorts Understands		Selects

Table 3: Colorado Common Core Cognitive Verb Correlations—Mathematics

	REMEMBER	UNDERSTAND	APPLY	ANALYZE
Number Sense	Counts Counts on Identifies	Compares Illustrates Infers Matches Orders Represents Sorts Understands	Applies Determines Rounds	Composes/ Decomposes Selects Solves

	REMEMBER	UNDERSTAND	APPLY	ANALYZE
Data Analysis	Identifies	Interprets Represents Summarizes		Selects
Shape, Dimension, and Geometric Relationships	Identifies Names	Classifies Compares Finds Infers Matches Orders Reads Represents Sorts Understands	Determines Estimates Measures	Selects Solves

Table 4: Pennsylvania Common Core Cognitive Verb Correlations—Mathematics

	REMEMBER	UNDERSTAND	APPLY	ANALYZE
Number and Operations	Counts Counts on Identifies Recognizes	Compares Explains Illustrates Interprets Orders Represents Understands	Determines Rounds	Composes/ Decomposes Solves
Algebraic Concepts	Identifies	Infers Matches Represents Understands	Applies Determines	Selects Solves
Geometry	Identifies Names	Classifies Compares Matches Represents Sorts Understands		Selects
Measurement and Data	Identifies	Classifies Compares Finds Infers Interprets Matches Orders Predicts Reads Represents Sorts Summarizes Understands		Selects

Table 5: Virginia State Cognitive Verb Correlations—Mathematics

	REMEMBER	UNDERSTAND	APPLY	ANALYZE
Number and Number Sense	Counts Counts on Identifies Recognizes	Classifies Compares Illustrates Interprets Orders Represents Sorts Understands	Rounds	Composes/Decomposes
Computation and Estimation		Infers Represents Understands	Applies Determines Estimates	Selects Solves
Measurement and Geometry	Identifies Names	Classifies Compares Finds Illustrates Infers Matches Orders Reads Represents Sorts Understands	Determines Estimates Measures	Selects Solves
Probability and Statistics	Identifies	Exemplifies Finds Illustrates Infers Interprets Orders Predicts Represents Summarizes Understands		Selects
Patterns, Functions, and Algebra		Classifies Explains Finds Illustrates Infers Interprets Matches Represents Sorts Understands	Determines Extends	Analyzes Selects Solves

NWEA provides these cognitive verbs to assist the instructor with the PGID statement interpretation. They reflect only the calibrated test questions. No mathematics test questions that use the cognitive process dimensions “evaluate” and “create” are currently calibrated. As the number of calibrated test questions in the MPG Survey with Goals assessments increases, NWEA will continue to update this list.

Learning initial mathematical concepts does not mean that students only work at the “remember” and “understand” cognitive process dimensions. NWEA’s test questions assess mathematical skills and knowledge across the full range of cognitive process dimensions.

The following chart defines each cognitive verb for each cognitive process dimension:

Table 6: Cognitive Verb Definitions—Mathematics

COGNITIVE PROCESS DIMENSION	COGNITIVE VERB	DEFINITION AND EXAMPLES
Remember <i>Retrieve relevant knowledge from long-term memory.¹</i>	Counts	Uses one-to-one correspondence (moving specific number of items), or reciting numbers in order beginning with the smallest whole number, often memorized (for example, count to 10, beginning with 1; count by 2’s, beginning with 2).
	Counts on	Recites numbers in order, beginning with a number that is not the smallest whole number (for example, counts on by 1’s from 34; counts by 2’s from 16; counts on by 2’s from 17).
	Identifies	Recognizes the mathematical concept using long-term memory (for example, a title of a graph; the number immediately after a given number).
	Names	Identifies the mathematical term for a given object (for example, “triangle” and “cylinder”).
	Recognizes	Identifies the number word for a number or the numeral for a number word (for example, “two” is the number word for 2).
Understand <i>Construct meaning from instructional messages, including oral, written, and graphic communication.¹</i>	Classifies	Chooses the appropriate objects or numbers for a specified classification (for example, chooses the object that has line symmetry).
	Compares	Uses either words or symbols to compare two objects, numbers, or situations by their magnitude (for example, larger, more, hotter, greater, >, <, =).
	Exemplifies	Gives an example in either numerical or word form (for example, odd number; response 3).
	Explains	Uses words to describe the effect of a given situation or procedure (“ice melts when it is very hot” or “to add $54 + 78$, add $50 + 70$, add $4 + 8$, then add $120 + 12$ ”).
	Finds	Isolates the incorrect example (for example, “Which does not show 3?”).
	Illustrates	Gives an example in pictorial form (for example, odd number of objects: response $\square \square \square$).
	Infers	Draws a logical conclusion (for example, the rule for a pattern).
	Interprets	Understands the meaning of a mathematical concept to identify a number or object (for example, interprets a number line to choose a number that corresponds to a given position).

COGNITIVE PROCESS DIMENSION	COGNITIVE VERB	DEFINITION AND EXAMPLES
	Matches	Chooses an equivalent representation (for example, three blocks shown horizontally is the same number of blocks as three blocks shown vertically).
	Orders	Arranges three or more objects or numbers in ascending or descending order (for example, order the numbers 4, 8, 2 from smallest to largest).
	Predicts	Draws a logical conclusion about what may happen in the future (for example, probability—certain, likely, impossible).
	Reads	Determines the magnitude when a picture of a measuring tool is given (for example, determines the length of a picture of an object when a picture of a ruler is placed beside the object; determines the temperature from a picture of a thermometer).
	Represents	Understands different ways of showing equivalent concepts (for example, represents a fraction, using a diagram; represents a story problem, using an equation).
	Sorts	Moves pictures of objects into categories (for example, sorts big and little balls).
	Summarizes	Generalizes the data in a graph, chart, or table to determine an appropriate title.
	Understands	Knows the meaning of a concept to give a mathematical answer (for example, knows days of week to identify tomorrow; knows meaning of addition to identify the plus symbol (+) in an equation).
Apply <i>Carry out or use a procedure in a given situation.¹</i> (The procedure may have been taught or invented by the student.)	Applies	Uses a procedure or rule (for example, applies the rule to create a pattern).
	Determines	Figures out the answer, using whatever strategy or procedure the student prefers (for example, the sum of $6 + 5$ is 11).
	Estimates	Determines an approximate answer based on rules of rounding (for example, the approximate sum of 31 and 52).
	Extends	After inferring the rule, continues a repeating or growing pattern (for example, $[\] [\] \ o \ o \ [\] [\] \ o \ o \ [\] [\] \ o \ o$, what comes next?).
	Measures	Uses a manipulative to determine the length of a picture of an object (for example, moves a picture of a ruler to determine length of a picture of a pencil).
	Rounds	Applies the rules for approximation (for example, 18 is closer to 20 than it is to 10).

COGNITIVE PROCESS DIMENSION	COGNITIVE VERB	DEFINITION AND EXAMPLES
Analyze <i>Break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose.¹</i>	Analyzes	Reviews given information to select an appropriate organization or procedure (for example, select two categories that could be used to sort a given selection of objects).
	Composes/ Decomposes	Rewrites a number or expression using smaller quantities and then groups the decomposed numbers to make computation easier. For example, $54 + 23$: $= 50 + 4 + 20 + 3$ $= 50 + 20 + 4 + 3$ $= 70 + 7$ $= 77$
	Selects	Distinguishes relevant from irrelevant information (for example, selects the necessary information or an appropriate strategy to solve a story problem).
	Solves	Distinguishes relevant from irrelevant information, determines appropriate procedure, and applies procedure (for example, solves a story problem).

For classification purposes, NWEA has made the following decisions:

- In Number Sense, “identifies” is used when different strategies may be used to determine the number of objects in a set. For example, how many hearts? ♥♥♥. Students may count or subitize (perceive an amount without counting).
- All test questions that ask a student to find an answer to a computation calculation are classified as “determines.” We do not know which strategy the student will choose to use. For example, some students may add; some may count on; some may draw pictures and then count.

Reading Cognitive Verbs

The following chart, based on the revised Bloom’s Taxonomy,¹ correlates the verbs used in PGID statements for reading concepts to each cognitive process dimension.²

Table 7: NWEA Standard Cognitive Verb Correlations—Reading

	REMEMBER	UNDERSTAND	APPLY	ANALYZE	EVALUATE	CREATE
Phonological Awareness	Identifies	Classifies Sorts	Blends	Adds Deletes Distinguishes Finds Selects Substitutes		
Phonics	Identifies Recognizes	Classifies Matches	Determines	Finds Selects		
Concepts of Print	Identifies Recognizes	Classifies Interprets Matches		Alphabetizes Discriminates		
Vocabulary and Word Structure	Identifies Names	Infers Locates Matches Understands	Determines Uses	Discriminates Finds Selects		

	REMEMBER	UNDERSTAND	APPLY	ANALYZE	EVALUATE	CREATE
Comprehension	Identifies Recognizes Recalls	Classifies Compares Infers Interprets Locates Matches Predicts Sorts Understands	Determines	Distinguishes Finds Organizes Selects		
Writing	Identifies Recognizes	Classifies Infers Locates Matches Sorts Understands	Demonstrates Spells Uses	Completes Distinguishes Finds Organizes Substitutes Selects	Edits Detects Judges	Creates

Table 8: Common Core Cognitive Verb Correlations—Reading

	REMEMBER	UNDERSTAND	APPLY	ANALYZE	EVALUATE	CREATE
Foundational Skills	Identifies Recognizes	Classifies Matches Sorts	Blends	Adds Deletes Discriminates Distinguishes Finds Selects Substitutes		
Literature and Informational Text	Identifies Recognizes	Classifies Completes Infers Interprets Locates Matches Predicts Sorts Understands	Determines	Discriminates Distinguishes Finds		
Vocabulary Use and Functions	Identifies Names	Classifies Infers Locates Matches	Determines Uses	Selects		
Language and Writing	Identifies Recognizes	Classifies Locates Matches Sorts Understands	Demonstrates Determines Spells Uses	Completes Discriminates Finds Selects Substitutes	Edits Detects Judges	Creates

Table 9: Colorado Common Core Cognitive Verb Correlations—Reading

	REMEMBER	UNDERSTAND	APPLY	ANALYZE	EVALUATE	CREATE
Reading for All Purposes, Research and Reasoning	Identifies Recognizes	Classifies Compares Completes Infers Interprets Locates Matches Predicts Sorts Understands	Determines	Discriminates Distinguishes Finds Selects	Judges	
Print Concepts, Decoding, Vocabulary	Identifies Names Recognizes	Classifies Infers Locates Matches Understands	Determines Uses	Discriminates Finds Selects		
Oral Expression and Listening	Identifies	Classifies Infers Locates Matches Predicts Sorts Understands	Blends	Adds Deletes Distinguishes Selects Substitutes		
Writing and Composition	Identifies Recognizes	Classifies Completes Infers Locates Matches Sorts Understands	Demonstrates Determines Spells Uses	Discriminates Organizes Selects Substitutes	Detects Edits Finds	Creates

Table 10: Pennsylvania Common Core Cognitive Verb Correlations—Reading

	REMEMBER	UNDERSTAND	APPLY	ANALYZE	EVALUATE	CREATE
Foundational Skills	Identifies Recognizes	Classifies Matches Sorts	Blends Uses	Adds Deletes Discriminates Distinguishes Finds Selects Substitutes		
Reading	Identifies Names Recognizes	Classifies Completes Infers Interprets Locates Matches Predicts Sorts Understands	Determines Uses	Discriminates Distinguishes Finds Selects		

	REMEMBER	UNDERSTAND	APPLY	ANALYZE	EVALUATE	CREATE
Writing and Language	Identifies Recognizes	Classifies Completes Infers Locates Matches Sorts Understands	Demonstrates Determines Spells Uses	Discriminates Finds Organizes Selects Substitutes	Edits Detects Judges	Creates

Table 11: Virginia State Cognitive Verb Correlations—Reading

	REMEMBER	UNDERSTAND	APPLY	ANALYZE	EVALUATE	CREATE
Oral Language; Phonological Awareness; Units of Speech	Identifies Recognizes	Classifies Infers Locates Matches Sorts	Blends Demonstrates Uses	Deletes Distinguishes Finds Selects Substitutes		
Phonetic Principles and Word Analysis	Identifies Recognizes	Classifies Matches		Alphabetizes Finds Selects		
Reading	Identifies Recognizes	Classifies Infers Interprets Locates Matches Predicts Sorts	Uses	Alphabetizes Discriminates Discriminates Finds Selects		
Writing	Identifies Recognizes	Classifies Locates Matches Sorts Understands	Determines Spells Uses	Discriminates Organizes Selects Substitutes	Edits Detects Judges	Creates

NWEA provides these cognitive verbs intentionally to assist the instructor with the PGID statement interpretation. They reflect only the calibrated test questions. As the number of calibrated test questions in the MPG Survey with Goals assessments increases, NWEA will continue to update this list.

Learning initial reading concepts does not mean that students only work at the “remember” and “understand” cognitive process dimensions. NWEA’s test questions assess reading skills and knowledge across the full range of cognitive process dimensions.

The following chart defines each cognitive verb for each cognitive process dimension:

Table 12: NWEA Standard Cognitive Verb Definitions—Reading

COGNITIVE PROCESS DIMENSION	COGNITIVE VERB	DEFINITION OR EXAMPLES
Remember <i>Retrieve relevant knowledge from long-term memory.</i> ¹	Identifies	Locates knowledge from long-term memory that is consistent with presented material (for example, the letter “o” is a vowel; the picture on a page; the number of words in a sentence; word meanings based on given definitions; contraction of given words).

COGNITIVE PROCESS DIMENSION	COGNITIVE VERB	DEFINITION OR EXAMPLES
	Names	Specifies what something is called (for example, the word that matches a picture).
	Recalls	"Retrieve relevant knowledge from long-term memory" ¹
	Recognizes	Visually remembers or recalls the correct form or order (for example, letters; order of the alphabet).
Understand <i>Construct meaning from instructional messages, including oral, written, and graphic communication.¹</i>	Classifies	Determines that something belongs to a category (for example, picture words with the same beginning sound).
	Compares	Understands the relationship among multiple corresponding ideas, concepts, or examples.
	Exemplifies	Finds a specific example or illustration of a concept or principle (for example, blending sounds that represent a picture).
	Infers	Draws a logical conclusion based on presented material.
	Interprets	Understands the meaning of a component within a word (for example, root) to translate that meaning to a given example.
	Locates	Finds a specific example or illustration of a concept or principle (for example, a writing topic for a writing web; a map feature using a map key).
	Matches	Understands the relationship between two corresponding ideas or concepts (for example, letters and sounds, or words and picture words).
	Predicts	Infers a future conclusion based on details and evidence in literary or informative text, or based on details in a picture or illustration.
	Sorts	Organizes and arranges multiple examples that belong to a category or classification.
	Understands	Demonstrates knowledge of a concept or skill (for example, use of punctuation and purpose of text features).
Apply <i>Carry out or use a procedure in a given situation.¹</i>	Blends	Combines sounds to form words.
	Completes	Uses a rule to complete a sentences (for example, superlative adjectives).
	Demonstrates	Shows knowledge to about a familiar task (for example, the meaning of a prepositional phrase)
	Spells	Manipulates letters and their associated sounds to spell words.
	Uses	Applies a procedure (for example, placing a punctuation mark in the appropriate place).
Analyze	Adds	Appends a sound or sounds to create a new word (for example, "at" into "cat").
	Alphabetizes	Determines how words or letters fit within a structure when organizing words or letters in alphabetical order.

COGNITIVE PROCESS DIMENSION	COGNITIVE VERB	DEFINITION OR EXAMPLES
Analyze (continued) <i>Break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose.¹</i>	Deletes	Removes a sound or sounds to create a new word (for example, "cat" into "at").
	Discriminates	Differentiates with visual or auditory skills, based on the component parts of the presented material (for example, visually discriminating words or letters that are the same).
	Distinguishes	Determines examples and non-examples, based on the component parts within a structure (for example, differentiating between facts and opinions).
	Finds	Determines how component parts fit within a given structure (for example, dividing a word into syllables).
	Organizes	Determines the specific order of component parts within a given structure (for example, ordering sentences to make a paragraph).
	Selects	Analyzes from multiple examples to distinguish something, based on components parts of presented material (for example, number of syllables in a word; sentences that use spaces between words correctly).
	Substitutes	Replaces a letter and/or sound in a word to form a new word or representation of a word (a picture word).
Evaluate <i>Make judgments based on criteria and standards.¹</i>	Detects	Checks for inconsistencies within a process (for example, is the sentence written correctly?).
	Edits	Applies given criteria or standards to examples in presented material.
	Evaluates	Chooses, based on given criteria.
	Judges	Determines the appropriateness of an example for a specific purpose.
Create³ <i>Put elements together to form a coherent or functional whole; reorganize elements into a new pattern or structure.¹</i>	Creates	Manipulates and orders words or text to form a sentence.

Notes

- ¹ Lorin W. Anderson, David R. Krathwohl, et al., eds. *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. New York: Longman, 2001.
- ² NWEA has classified the cognitive verbs with the *Primary Grades Instructional Data* statements to the cognitive framework of the revised Bloom's Taxonomy. This includes the use of verbs tailored to their appropriate use in each subject area. "There has always been and remains to this day an expectation that the Taxonomy would be adapted as educators in different fields used it, as education changes, and as new knowledge provided a basis for change." (Anderson, p. xxcii).
- ³ In the MAP for Primary Grades Reading tests, students do manipulate words to create new words or sentences. With item functionality, students create within a given structure. This is closest to the cognitive dimension of Create, but not fully the ability to construct and create as an independent response.