Woodcock-Johnson IV® Tests of Cognitive Abilities
Test Descriptions

Below are descriptions of the different tests included in the Woodcock-Johnson IV Tests of Cognitive Abilities and their corresponding CHC abilities. For more detailed descriptions of the different CHC abilities, please reference pages 8-10 of this document.

TEST	CHC ABILITY	DESCRIPTION	CONSIDERATIONS FOR INCLUSION IN EVALUATION PLAN[1]
Test 1: Oral Vocabulary	Measures the broad ability of comprehension-knowledge (Gc) and the narrow abilities of vocabulary and language development (VL/LD).	Includes two subtests: Synonyms and Antonyms, which each measure an aspect of vocabulary knowledge of spoken English. Synonyms requires the examinee to listen to a word and then provide an appropriate word with the same or a similar meaning. Antonyms requires the examinee to hear a word and then provide an appropriate word with an opposite meaning.	Contributes to the General Intellectual Ability (GIA) score. Contributes to the Brief Intellectual Ability (BIA) score. Contributes to the Gf-Gc Composite. May have clinical utility for examinees who present with difficulties with: • Acquiring vocabulary • Comprehending oral and written language • Using prior knowledge to support learning • Finding the right words to use/say Contributes to predicted achievement in: • Reading • Broad Reading • Basic Reading Skills • Reading Comprehension • Reading Fluency • Reading Rate • Mathematics • Broad Mathematics • Math Calculation Skills • Math Problem Solving Skills • Written Language • Broad Written Language • Basic Writing Skills • Written Expression

TEST	CHC ABILITY	DESCRIPTION	CONSIDERATIONS FOR INCLUSION IN EVALUATION PLAN[1]
Test 2: Number Series	Measures the broad ability of fluid reasoning (Gf) and the narrow abilities of quantitative reasoning (RQ) and inductive reasoning (I).	The examinee is presented with a series of numbers with one number missing in the series. The examinee must determine the missing number.	Contributes to the General Intellectual Ability (GIA) score. Contributes to the Brief Intellectual Ability (BIA) score. Contributes to the Gf-Gc Composite. May have clinical utility for examinees who present with difficulties with: • Creating solutions to novel problems • Transferring and generalizing learning • Problem solving through rule application • Higher level reasoning with numbers • Transforming and extending knowledge Contributes to predicted achievement in: • Mathematics • Broad Mathematics • Math Calculation Skills
Test 3: Verbal Attention	Measures the broad ability of short-term working memory (Gwm), sometimes described as verbal working memory. Taps attentional control (AC; controlled executive function), a critical ability necessary for efficient working memory. Also tests the narrow ability of working memory capacity (WM).	The examinee must listen to an intermingled series or animals and digits presented on the audio recording. Rather than repeating the series or regrouping the items into animals and digits, the examinee must answer a specific question regarding the sequence.	Contributes to the General Intellectual Ability (GIA) score. Contributes to the Brief Intellectual Ability (BIA) score. May have clinical utility for examinees who present with difficulties with: • Following multi-step oral or written directions • Remembering information long enough to apply it • Remembering sequences of information • Maintaining one's place during math problem solving or while writing • Listening to and comprehending lengthy discourse Contributes to predicted achievement in: • Basic Reading Skills • Basic Writing Skills
Test 4: Letter-Pattern Matching	Measures the broad ability of cognitive processing speed (Gs) and the narrow ability of perceptual speed (P).	The examinee is asked to locate and circle two identical letter patterns in a row of six patterns in the Response Booklet.	Contributes to the General Intellectual Ability (GIA) score. May have clinical utility for examinees who present with difficulties with: • Processing information quickly and efficiently • Completing timed tasked within time limits • Making rapid comparisons/perceiving relationships • Completing simple, rote tasks quickly

TEST	CHC ABILITY	DESCRIPTION	CONSIDERATIONS FOR INCLUSION IN EVALUATION PLAN[1]
Test 5: Phonological Processing	Measures the broad ability of auditory processing (Ga), while also tapping an examinee's speed of lexical access, a narrow ability of long-term retrieval (Glr). Other narrow abilities tapped include phonetic coding (PC) and word fluency (Glr-FW).	Comprised of three parts: Word Access: Requires the examinee to provide a word that has a specific phonemic element in a specific location. Word Fluency: Requires the examinee to name as many words as possible that begin with a specific sound in 1 minute. Substitution: Requires the examinee to substitute part of a word to create a new word.	Contributes to the General Intellectual Ability (GIA) score. May have clinical utility for examinees who present with difficulties with: • Processing information presented orally • Sound discrimination • Decoding and encoding • Learning a foreign language Contributes to predicted achievement in: • Reading • Broad Reading • Basic Reading Skills • Reading Comprehension • Reading Fluency • Reading Rate • Written Language • Broad Written Language • Basic Writing Skills • Written Expression
Test 6: Story Recall	Measures the broad ability of long-term retrieval (Glr) and the narrow ability of meaningful memory (MM), in addition to some aspects of oral language development (i.e., Listening Ability, Gc-LS).	The examinee is required to recall increasingly complex stories that are presented from an audio recording.	Contributes to the General Intellectual Ability (GIA) score. May have clinical utility for examinees who present difficulties with: • Recalling/retrieving information using association • Retrieving specific information • Learning information quickly Contributes to predicted achievement in: • Written Language • Broad Written Language • Written Expression
Test 7: Visualization	Measures the broad ability visual processing (Gv) and two components of the narrow ability visualization (i.e., spatial relations and block rotation)	Requires the examinee to identify two or three pieces that form a complete target shape. The item difficulty increases as the pieces that form the shape are flipped, rotated, and become more similar in appearance.	Contributes to the General Intellectual Ability (GIA) score. May have clinical utility for examinees who present with difficulties with: • Noting visual detail • Reading maps, graphs, and charts • Sensing spatial orientation/characteristics • Recalling visual information Contributes to predicted achievement in: • Mathematics • Broad Mathematics • Math Calculation Skills • Math Problem Solving Skills

TEST	CHC ABILITY	DESCRIPTION	CONSIDERATIONS FOR INCLUSION IN EVALUATION PLAN[1]
Test 8: General Information	Measures the depth and breadth of an examinee's general information and knowledge and general (verbal) information (KO), an aspect of the broad ability of comprehension-knowledge (Gc).	Includes two subtests: Where and What. The first subtest requires the examinee to identify where an object is found, while the second requires the examinee to identify what people do with given objects.	Contributes to the Comprehension-Knowledge (Gc) cluster. Contributes to the Gf-Gc Composite. May have clinical utility for examinees who present with difficulties with: • Acquiring general knowledge and knowledge in content areas • Answering fact-based/informational questions • Comprehending oral and written language • Using prior knowledge to support learning • Finding the right words to use/say
Test 9: Concept Formation	Measures fluid reasoning (Gf) and taps the narrow ability of induction (I).	Require the examinee to identify, categorize, and determine rules when presented with a stimulus set	Contributes to the Fluid Reasoning (Gf) cluster. Contributes to the Gf-Gc Composite. May have clinical utility for examinees who present with difficulties with: • Creating solutions to novel problems • Transferring and generalizing learning • Problem solving through rule application • Transforming and extending knowledge • Thinking conceptually Contributes to predicted achievement in: • Reading • Broad Reading • Reading Comprehension • Reading Fluency • Reading Rate
Test 10: Numbers Reversed	Measure short-term working memory (Gwm). It also can be classified as a test of working memory capacity (WM) and attentional control (AC). The narrow ability of number facility (N) also is assessed	Examinees are asked to listen to and recall a sequence of digits in reversed order	Contributes to the Short-Term Working Memory (Gwm) cluster. May have clinical utility for examinees who present with difficulties with: • Remembering information long enough to apply it • Remembering sequences of information Maintaining one's place during math problem solving or while writing • Rote memorization • Contributes to predicted achievement in: • Math Problem Solving Skills

TEST	CHC ABILITY	DESCRIPTION	CONSIDERATIONS FOR INCLUSION IN EVALUATION PLAN[1]
Test 11: Number-Pattern Matching	Measures the broad ability of cognitive processing speed (Gs) and the narrow abilities of perceptual speed (P) and number facility (N).	The examinee is required to rapidly locate and circle two identical numerals from a defined set of numbers.	Contributes to the Number Facility (N), Perceptual Speed (P), and Cognitive Efficiency clusters. May have clinical utility for examinees who present with difficulties with: • Processing information quickly and efficiently • Completing timed tasked within time limits • Making rapid comparisons/perceiving relationships • Completing simple, rote tasks quickly Contributes to predicted achievement in: • Reading • Broad Reading • Basic Reading Skills • Reading Comprehension • Reading Fluency • Reading Rate • Written Language • Broad Written Language • Basic Writing Skills • Written Expression
Test 12: Nonword Repetition	Measures phonological processing, aspects of auditory processing (Ga) and short-term working memory (Gwm). Narrow abilities include phonetic coding (Pc), memory for sound patterns (UM), and memory span (Gwm-MS).	Examinees are asked to listen to a nonsense word and repeat it exactly	Contributes to the Auditory Processing (Ga) cluster. May have clinical utility for examinees who present with difficulties with: • Processing information presented orally • Sound discrimination • Paying attention, particularly in the presence of background noise • Speech/auditory perception • Acquiring a foreign language
Test 13: Visual-Auditory Learning	Measures the broad ability of long-term storage and retrieval (Glr) and the narrow ability of associative memory (MA).	Examinees are asked to learn and recall pictographic representations of words.	Contributes to the Long-Term Retrieval (Glr) cluster. May have clinical utility for examinees who present with difficulties with: • Recalling/retrieving information using association • Using associations to facilitate storage and retrieval • Learning information quickly • Pairing and retaining visual and auditory information

TEST	CHC ABILITY	DESCRIPTION	CONSIDERATIONS FOR INCLUSION IN EVALUATION PLAN[1]
Test 14: Picture Recognition	Measures the broad ability of visual processing (Gv) and taps the narrow ability of visual memory (MV).	The examinee is asked to recognize a subset of previously presented pictures within a field of distracting pictures.	Contributes to the Visual Processing (Gv) cluster. May have clinical utility for examinees who present with difficulties with: • Noting visual detail • Recognizing patterns • Sensing spatial orientation/characteristics • Recalling visual information
Test 15: Analysis-Synthesis	Measures fluid reasoning (Gf) and the narrow ability of general sequential reasoning (RG).	The examinee is required to analyze puzzles, using symbolic formulations, to determine missing components.	Contributes to the Fluid Reasoning-Extended (Gf-Ext) cluster. Contributes to the Gf-Gc Composite. May have clinical utility for examinees who present with difficulties with: • Creating solutions to novel problems • Transferring and generalizing learning • Problem solving through rule application • Transforming and extending knowledge • Solving abstract problems Contributes to predicted achievement in: • Math Problem Solving Skills
Test 16: Object-Number Sequencing	Measures the broad ability of short-term working memory (Gwm) and the narrow ability of working memory capacity (WM).	The examinee is asked to listen to a series of intermingled numbers and words on the audio recording (e.g., cat, 2, shoe, 8, 9, pear) and then reorder the stimuli, repeating the objects first in sequential order and then the numbers in sequential order.	Contributes to the Short-Term Working Memory-Extended (Gwm-Ext) cluster. May have clinical utility for examinees who present with difficulties with: Following multi-step oral or written directions Remembering information long enough to apply it • Remembering sequences of information • Maintaining one's place during math problem solving or while writing • Rote memorization

TEST	CHC ABILITY	DESCRIPTION	CONSIDERATIONS FOR INCLUSION IN EVALUATION PLAN[1]
Test 17: Pair Cancellation	Measures the broad ability of cognitive processing speed (Gs). Note that the narrow abilities of perceptual speed (P), spatial scanning (Gv-SS), and attentional control (Gwm-AC) are also tapped by this test.	The examinee is required to stay on task and vigilant as they rapidly locate and mark a repeated pattern within a 3-minute time limit.	Contributes to the Cognitive Processing Speed (Gs) cluster. May have clinical utility for examinees who present with difficulties with: • Processing information quickly and efficiently • Completing timed tasked within time limits • Making rapid comparisons/perceiving relationships • Completing simple, rote tasks quickly Contributes to predicted achievement in: • Mathematics • Broad Mathematics • Math Calculation Skills
Test 18: Memory for Words	Measures the broad ability of short-term working memory (Gwm) and the narrow ability of memory span (MS).	The examinee is asked to repeat lists of unrelated words in the correct sequence.	Contributes to the Auditory Memory Span (MS) cluster. May have clinical utility for examinees who present with difficulties with: • Following multi-step oral or written directions • Remembering information long enough to apply it • Remembering sequences of information • Maintaining one's place during math problem solving or while writing • Rote memorization • Taking notes

Woodcock-Johnson IV® Tests of Oral Language
Definitions of CHC Abilities

Comprehension-Knowledge (Gc)

Originally described as crystallized intelligence, including the depth and breadth of a person's acquired knowledge, the ability to communicate one's knowledge, and the ability to reason using previously learned experiences or procedures. This story of knowledge is primarily language-based and represents those abilities that have been developed largely through the investment of time, talent, and resources during education and general life experiences.

Fluid Reasoning (Gf)

Includes the broad ability to reason, form concepts, and solve problems using unfamiliar information or novel procedures. It is a complex mixture of many mental operations, such as identifying relations, drawing inferences, recognizing, and forming concepts, identifying conjunctions, and recognizing disjunctions. It also requires deliberate and flexible control of attention to solve on-the-spot problems.

Long-term Retrieval (Glr)

The ability to store information, after it has been displaced from short-term working memory, and fluently retrieve it later in the process of thinking. This ability involves both the amount of information that can be stored and the rate and fluency with which the information can be retrieved and accessed.

Visual Processing (Gv)

The ability to perceive, analyze, synthesize, and think with visual patterns. Includes the ability to store and recall visual representations (visual working memory and long-term retrieval of visual elements).

Auditory Processing (Ga)

The ability to encode, synthesize, and discriminate auditory stimuli, including the ability to employ auditory information in task performance. Auditory processing includes many of the abilities referred to as phonological awareness, phonological processing, phonological sensitivity, and phonetic coding.

Cognitive Processing Speed (Gs)

The ability to quickly perform both simple and complex cognitive tasks, particularly when measured under pressure to sustain controlled attention and concentration. Cognitive processing speed is an aspect of cognitive efficiency.

Short-Term Working Memory (Gwm)

The ability to apprehend and hold information in immediate awareness and then use or manipulate it to carry out a goal. Short-Term Working Memory is a limited capacity system where information is typically retained for only a few seconds before it is lost or transformed. Short-Term Working Memory reflects both the capacity to hold and manipulate information, as well as efficiency of attentional control during this process.

Woodcock-Johnson IV® Tests of Oral Language
Definitions of CHC Abilities

Perceptual Speed (P)

The ability to rapidly perform simple, rote, and/or clerical tasks that involve symbols (e.g., matching letters or numbers). Perceptual speed requires both speed and fluency. It also is related to orthographic processing, a skill that is needed for decoding and encoding.

Quantitative Reasoning (RQ)

The ability to reason inductively and deductively with quantities, mathematical relations, and operators.

Auditory Memory Span (MS)

The ability to hold auditory information in immediate awareness. Tasks tapping this skill typically require the examinee to hold information in immediate awareness, and then repeat that information in a specific sequence.

Number Facility (N)

Fluency with numbers, including number-pattern comparisons, and the ability to manipulate numbers in short-term working memory.

Vocabulary (VL/LD)

Includes both language development and lexical k knowledge.

- Language Development (LD)- The ability to comprehend and communicate using language. An individual's general understanding of spoken language at the level of words, idioms, and sentences.
- Lexical Knowledge (VL)- The knowledge of the definitions of words and the concepts that underlie them.

Phonetic Coding (PC)

An aggregate measure of auditory processing, including phonological awareness (both analysis and synthesis).

Attentional Control (AC)

The ability to manipulate the spotlight of attention flexibly to focus on task-relevant stimuli and ignore distractors.

Working Memory Capacity (WC)

The ability to manipulate information in one's primary memory.

Listening Ability (LS)

The ability to understand speech, beginning with word-level comprehension, and developing into the ability to understand longer/complex verbal input.

Meaningful Memory (MM)

The ability to remember narratives and other semantically-related information.

Associative Memory (MA)

The ability to form a link between two previously unrelated stimuli such that the subsequent presentation of one stimulus triggers the recall of the other stimuli.

Word Fluency (FW)

The ability to rapidly produce words that share a phonological or semantic feature.

Speed of Lexical Access (LA)

The ability to retrieve words quickly and accurately from one's knowledge stores.

Visual Memory (MV)

Ability to remember complex visual stimuli over short durations of time.

Memory of Sound Patterns (UM)

The ability to retain tones, tonal patterns, or speech sounds (phonemes).

Inductive Reasoning/Induction (I)

Inductive reasoning is a method of reasoning in which a body of observations is synthesized to form a general principle. It demands the ability to make broad generalizations based on specific observations.