



# Essentials

## of **WJ IV<sup>®</sup> Tests of Achievement**

- Complete coverage of administration, scoring, interpretation, and reporting
- Expert advice on avoiding common pitfalls
- Conveniently formatted for rapid reference

**Nancy Mather**

**Barbara J. Wendling**

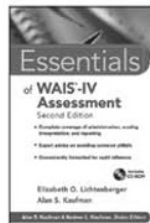
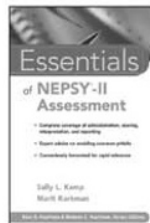
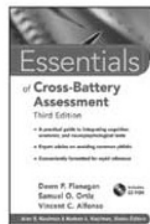
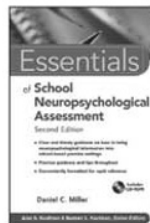
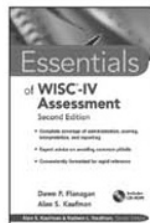
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# Essentials

## of WJ IV<sup>®</sup> Tests of Achievement

Nancy Mather and  
Barbara J. Wendling

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## SERIES PREFACE

In the *Essentials of Psychological Assessment* series, we have attempted to provide the reader with books that will deliver key practical information in the most efficient and accessible style. The series features instruments in a variety of domains, such as cognition, personality, education, and neuropsychology. For the experienced clinician, books in the series will offer a concise yet thorough way to master utilization of the continuously evolving supply of new and revised instruments, as well as a convenient method for keeping up to date on the tried-and-true measures. The novice will find here a prioritized assembly of all the information and techniques that must be at one's fingertips to begin the complicated process of individual psychological diagnosis.

Wherever feasible, visual shortcuts to highlight key points are utilized alongside systematic, step-by-step guidelines. Chapters are focused and succinct. Topics are targeted for an easy understanding of the essentials of administration, scoring, interpretation, and clinical application. Theory and research are continually woven into the fabric of each book, but always to enhance clinical inference, never to sidetrack or overwhelm. We have long been advocates of “intelligent” testing—the notion that a profile of test scores is meaningless unless it is brought to life by the clinical observations and astute detective work of knowledgeable examiners. Test profiles must be used to make a difference in the child's or adult's life, or why bother to test? We want this series to help our readers become the best intelligent testers they can be.

The *Essentials of WJ IV<sup>®</sup> Tests of Achievement* is designed to be a helpful reference to all examiners, whether they are experienced with the WJ III or just learning the WJ IV. The internationally renowned authors have incorporated fine points of administration, scoring, and interpretation to assist examiners in building their competency with the WJ IV Tests of Achievement and the WJ IV Tests of Oral Language. The authors weave expert guidance throughout to help

the reader avoid common examiner errors. Appendix B includes answers to frequently asked questions.

Too often the focus of testing is on getting a score or establishing a numeric discrepancy. Much more information can be derived from an achievement or oral language test than just a score. In this book, the authors provide access to the rich, interpretive information available when using the WJ IV ACH or the WJ IV OL.

*Alan S. Kaufman, PhD, and Nadeen L. Kaufman, EdD, Series Editors*  
Yale Child Study Center, Yale University School of Medicine

## ACKNOWLEDGMENTS

**W**e would like to express our sincere appreciation to the numerous dedicated assessment professionals who help children and adults understand their unique strengths and weaknesses and prescribe targeted interventions designed to foster their success.

Dr. Richard Woodcock has had a profound effect on our professional lives and we are grateful for his influence, inspiration, and mentorship. We acknowledge his many contributions that have led to diagnostic and practical tools for assessment professionals. Additionally, we acknowledge the leadership and support of Dr. Fredrick Schrank in the development of the WJ IV.

Finally, we are grateful for the contributions of Marquita Flemming, Sherry Wasserman, and the rest of the staff at John Wiley & Sons.





# One

## OVERVIEW

**A**lthough many standardized instruments exist for measuring academic performance, the Woodcock-Johnson Tests of Achievement (WJ ACH) is often cited as one of the most widely used and respected individual achievement tests since its original publication in 1977 (Gregory, 1996). The latest revision, the Woodcock-Johnson IV<sup>®</sup> Tests of Achievement (WJ IV ACH) (Schrank, Mather, & McGrew, 2014a), provides examiners with an even more comprehensive and useful instrument. The WJ IV ACH is a companion instrument to the Woodcock-Johnson IV Tests of Cognitive Abilities (WJ IV COG) (Schrank, McGrew, & Mather, 2014b) and the new Woodcock-Johnson Tests of Oral Language (WJ IV OL) (Schrank, Mather, & McGrew, 2014b). These three instruments form the Woodcock-Johnson IV (WJ IV) (Schrank, McGrew, & Mather, 2014a), a comprehensive battery of individually administered tests that are designed to measure general intellectual ability, specific cognitive abilities, oral language abilities, and achievement. Depending upon the purpose of the assessment, these instruments may be used independently, in conjunction with each other, or with other assessment instruments.

*Essentials of WJ IV<sup>®</sup> Tests of Achievement* provides an easy-to-use guide and reference for professionals and practitioners who wish to learn the key features of this instrument. This guide is appropriate for a wide array of professionals, whether their goal is to learn how to administer the test or simply to increase familiarity with the instrument. The topics covered include administration, scoring, interpretation, and application of the WJ IV ACH. In addition, one chapter is dedicated to the use and application of the WJ IV OL. All chapters include “Rapid Reference,” “Caution,” and “Don’t Forget” boxes that highlight important points. At the end of each chapter is a “Test Yourself” section designed to help examiners review and reinforce the key information presented. These features make the guide an ideal resource for both in-service and graduate training in the application and interpretation of the WJ IV ACH. Examiners may wish to

## Rapid Reference 1.1

### **Woodcock-Johnson IV Tests of Achievement**

*Authors:* Fredrick A. Schrank, Nancy Mather, and Kevin S. McGrew

*Publication date:* 2014

*Curricular areas the test measures:* Reading, written language, mathematics, and academic knowledge

*Age range:* 2 to 95+ years

*Grade range:* K.0 through 17.9

*Administration Time:* Standard Battery, 40 to 50 minutes; with Extended Battery, approximately another 45 minutes; selective testing, 5 to 10 minutes per test

*Qualifications of Examiners:* Undergraduate, graduate, or professional-level training and background in test administration and interpretation

*Publisher:*

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Rolling Meadows, IL 60008

Customer service: 800.323.9540

Fax: 630.467.7192

[www.riversidepublishing.com](http://www.riversidepublishing.com)

*Price:* WJ IV ACH complete test price (for any one Form A, B, or C) without case is \$629 (as of 2014)

read the book from cover to cover or turn to individual chapters to find specific information. Rapid Reference 1.1 provides basic information about the WJ IV ACH and its publisher.

### **HISTORY AND DEVELOPMENT**

The original Woodcock-Johnson Tests of Achievement was published in 1977 as part of the Woodcock-Johnson Psycho-Educational Battery (WJ) (Woodcock & Johnson, 1977). The WJ provided the first comprehensive, co-normed battery of cognitive abilities, achievement, and interests. The battery of tests measured a continuum of human abilities across a wide age range and provided common norms for interpretation. The Tests of Achievement consisted of 10 tests organized into four areas: reading, mathematics, written language, and knowledge.

The Woodcock-Johnson-Revised (WJ-R<sup>®</sup>) (Woodcock & Johnson, 1989) was designed to expand and increase the diagnostic capabilities of the WJ. The tests

were divided into two main batteries, the Tests of Cognitive Ability (WJ-R COG) and the Tests of Achievement (WJ-R ACH). The WJ-R COG and WJ-R ACH each had two easel test books, the Standard Battery and the Supplemental Battery. The WJ-R Tests of Achievement consisted of 14 tests organized into four curricular areas: reading, mathematics, written language, and knowledge. Several new tests were added to the reading and written language areas. To facilitate pre- and posttesting, parallel, alternate forms of the Tests of Achievement, Forms A and B, were published.

Like its predecessor, the Woodcock-Johnson III had two distinct batteries, the Tests of Cognitive Abilities and the Tests of Achievement (Woodcock, McGrew, & Mather, 2001). Together these batteries comprised a comprehensive system for measuring general intellectual ability ( $g$ ), specific cognitive abilities, predicted achievement, oral language, and achievement across a wide age range. As with the original WJ, one of the most important features of the WJ III system was that norms for the WJ III COG and WJ III ACH were based on data from the same sample of individuals. This co-norming provided greater accuracy and validity when making comparisons among and between an individual's obtained scores and provided new options for various discrepancy and variation procedures.

The latest edition, the WJ IV, is composed of three parts: the WJ IV Tests of Cognitive Abilities (WJ IV COG), the WJ IV Tests of Achievement (WJ IV ACH), and the WJ IV Tests of Oral Language (WJ IV OL). Together these three assessment instruments provide a comprehensive set of individually administered, norm-referenced tests for measuring intellectual abilities, academic achievement, and oral language. As with prior versions, the normative data are based on a single sample that was administered the cognitive, the oral language, and the achievement tests. This comprehensive assessment system facilitates exploring and identifying individual strengths and weaknesses across cognitive, oral language, and academic abilities.

## **ORGANIZATION OF THE WJ IV ACH**

As noted, the WJ IV ACH is a revised and expanded version of the WJ III Tests of Achievement. The WJ IV ACH has 20 tests that are organized into five main areas: reading, mathematics, written language, academic knowledge, and cross-domain clusters. The cross-domain clusters include tests from three different curricular areas (reading, mathematics, and writing). For example, the Academic Fluency cluster includes Sentence Reading Fluency, Math Facts Fluency, and Sentence Writing Fluency.

**Table 1.1 Organization of the WJ IV ACH Tests**

Academic Area	Standard Battery (Forms A, B, and C)	Extended Battery
<b>Reading</b>	Test 1: Letter-Word Identification Test 4: Passage Comprehension Test 7: Word Attack Test 8: Oral Reading Test 9: Sentence Reading Fluency	Test 12: Reading Recall Test 15: Word Reading Fluency Test 17: Reading Vocabulary
<b>Mathematics</b>	Test 2: Applied Problems Test 5: Calculation Test 10: Math Facts Fluency	Test 13: Number Matrices
<b>Writing</b>	Test 3: Spelling Test 6: Writing Samples Test 11: Sentence Writing Fluency	Test 14: Editing Test 16: Spelling of Sounds
<b>Academic Knowledge</b>		Test 18: Science Test 19: Social Studies Test 20: Humanities

All of the tests are contained in two easel test books, the Standard Battery and the Extended Battery. The Standard Battery has three forms (Forms A, B, and C) with one form of the Extended Battery. The Standard Batteries include the most commonly administered tests, so having three forms provides alternate and equivalent tests to facilitate retesting. The Extended Battery, which can be used with any of the three forms of the Standard Battery, includes tests that provide greater depth of coverage in each academic area. Table 1.1 shows the organization of the WJ IV ACH, which applies to Forms A, B, and C; the tests are presented by academic area rather than by numeric sequence.

Although many of the basic features have been retained, the extensive renorming and addition of new tests and interpretive procedures improve and increase the diagnostic capabilities. The areas of reading, mathematics, and written language each include measures of basic skills, fluency or automaticity, and application or higher-level skills. The Academic Knowledge cluster includes individual tests of Science, Social Studies, and Humanities that sample an individual's knowledge of the biological and physical sciences; history, geography, government, and economics; and art, music, and literature. Table 1.2 provides an overview of the content and task demands of each of the 20 achievement tests. Figure 1.1 illustrates item types for each of the achievement tests. The sample items shown are not actual test items.

**Table 1.2 Content and Task Demands of the 20 WJ IV ACH Tests**

Area	Test Name	Description	Task Demands
<b>Reading</b>	Test 1: Letter-Word Identification	Measures an aspect of reading decoding.	Requires identifying and pronouncing isolated letters and words.
	Test 4: Passage Comprehension	Measures reading comprehension of contextual information.	Requires reading a short passage and supplying a key missing word.
	Test 7: Word Attack	Measures aspects of phonological and orthographic coding.	Requires applying phonic and structural analysis skills to pronounce phonically regular nonsense words.
	Test 8: Oral Reading	Measures word reading accuracy and prosody.	Requires reading sentences aloud that gradually increase in difficulty.
	Test 9: Sentence Reading Fluency	Measures reading rate.	Requires reading and comprehending simple sentences and then deciding if the statement is true or false by marking yes or no (3-minute time limit).
	Test 12: Reading Recall	Measures reading comprehension and meaningful memory.	Requires reading a passage silently one time and then retelling the story orally.
	Test 15: Word Reading Fluency	Measures vocabulary knowledge and semantic fluency.	Requires marking two words that go together in a row of four words (3-minute time limit).
	Test 17: Reading Vocabulary	Measures reading vocabulary and comprehension.	Requires reading and providing synonyms or antonyms.
<b>Mathematics</b>	Test 2: Applied Problems	Measures the ability to analyze and solve practical math problems, mathematical reasoning.	Requires comprehending the nature of the problem, identifying relevant information, performing calculations, and providing solutions.

*(continued)*

**Table 1.2 (Continued)**

Area	Test Name	Description	Task Demands
<b>Written Language</b>	Test 5: Calculation	Measures the ability to perform mathematical computations.	Requires calculation of simple to complex mathematical facts and equations.
	Test 10: Math Facts Fluency	Measures aspects of number facility and math achievement.	Requires rapid calculation of single-digit addition, subtraction, and multiplication facts (3-minute time limit).
	Test 13: Number Matrices	Measures quantitative reasoning.	Requires providing the missing number from a matrix.
	Test 3: Spelling	Measures the ability to spell dictated words.	Requires writing the correct spelling of words presented orally.
	Test 6: Writing Samples	Measures quality of meaningful written expression and ability to convey ideas.	Requires writing sentences in response to a series of demands that increase in difficulty.
	Test 11: Sentence Writing Fluency	Measures aspects of automaticity with syntactic components of written expression.	Requires formulating and writing simple sentences rapidly (5-minute time limit).
	Test 14: Editing	Measures the ability to identify and correct errors in spelling, usage, punctuation, and capitalization.	Requires identifying errors in short written passages and correcting them orally.
	Test 16: Spelling of Sounds	Measures aspects of phonological/orthographic coding.	Requires spelling nonsense words that conform to conventional English spelling rules.
<b>Academic Knowledge</b>	Test 18: Science	Measures specialized knowledge in science, including biology, chemistry, geology, and physics.	Requires providing an oral response to orally presented questions; many items provide visual stimuli and early items require a pointing response only.

**Table 1.2 (Continued)**

Area	Test Name	Description	Task Demands
	Test 19: Social Studies	Measures specialized knowledge in social studies, including history, geography, government, and economics.	Requires providing an oral response to orally presented questions; many items provide visual stimuli and early items require a pointing response only.
	Test 20: Humanities	Measures specialized knowledge in humanities, including art, music, and literature.	Requires providing an oral response to orally presented questions; many items provide visual stimuli and early items require a pointing response only.

**Standard Battery****Test 1: Letter-Word Identification**

The task requires identifying and pronouncing isolated letters and words.

g r cat palm officiate

**Test 2: Applied Problems**

The task involves analyzing and solving practical mathematical problems.

Bill had \$7.00. He bought a ball for \$3.95 and a comb for \$1.20. How much money did he have left?

**Test 3: Spelling**

The task involves written spellings of words presented orally.

Spell the word *horn*. She played the *horn* in the band. *Horn*.

**Test 4: Passage Comprehension**

The task requires reading a short passage silently and then supplying a key missing word.

The boy \_\_\_\_\_ off his bike. (Correct: fell, jumped, etc.)

The book is one of a series of over eighty volumes. Each volume is designed to provide convenient \_\_\_\_\_ to a wide range of carefully selected articles. (Correct: access)

**Test 5: Calculation**

The task includes mathematical computations from simple addition facts to complex equations.

$$2 + 4 =$$

$$3x + 3y = 15, 2x - y = 1,$$

$$x =$$

$$y =$$

**Figure 1.1 WJ IV ACH-Like Sample Items**

**Test 6: Writing Samples**

The task requires writing sentences in response to a variety of demands that are then evaluated based on the quality of expression.

Write a good sentence to describe the picture.




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**Test 7: Word Attack**

The task requires pronouncing nonwords that conform to English spelling rules.

flib

bungicality

**Test 8: Oral Reading**

The task requires the oral reading of sentences that increase in complexity and are evaluated for accuracy and expression.

The dog ate the bone.

The philanthropist provided the botanical society with a new greenhouse.

**Test 9: Sentence Reading Fluency (timed)**

The task requires rapidly reading and comprehending simple sentences.

People can swim in pools.    yes    no

**Test 10: Math Facts Fluency (timed)**

The task requires rapid calculation of simple, single-digit addition, subtraction, and multiplication facts.

$$\begin{array}{r} 2 \quad 10 \quad 1 \quad 3 \\ \times 3 \quad -5 \quad \times 2 \quad +2 \end{array}$$

**Test 11: Sentence Writing Fluency (timed)**

The task requires formulating and writing simple sentences quickly when given three words and a picture.

books  
likes  
read




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**Figure 1.1 Continued**



**Extended Battery****Test 12: Reading Recall**

The task requires reading passages of gradually increasing length and complexity and then recalling the story elements.

Martha went to the store to buy groceries. When she got there, she discovered that she had forgotten her shopping list. She bought milk, eggs, and flour. When she got home she discovered that she had remembered to buy everything except the butter.

**Test 13: Number Matrices**

This task involves identifying the missing number in a numerical matrix.

2	4
6	

**Test 14: Editing**

The task requires identifying and correcting mistakes in spelling, punctuation, capitalization, or word usage in written passages.

Bobby's face was so sunburned, it looked like he had fell into a bucket of red paint.  
(Correct: fallen)

**Test 15: Word Reading Fluency (timed)**

This test requires reading a set of four words and marking the two words that go together.

street   horse   pencil   road

**Test 16: Spelling of Sounds (audio recording)**

The task requires spelling nonwords that conform to English spelling rules.

larches  
shuff

**Task 17: Reading Vocabulary**

The test involves reading stimulus words for two different tasks: providing synonyms and providing antonyms.

Read this word out loud and tell me another word that means the same.  
big

Read this word out loud and tell me another word that means the opposite.  
yes

**Test 18: Science**

The task involves answering questions about curricular knowledge in various areas of the biological and physical sciences.

How many eyes do most spiders have?

**Figure 1.1 Continued**

**Test 19: Social Studies**

The task involves answering questions about curricular knowledge in various areas of history, geography, government, and economics.

What is excise tax?

**Test 20: Humanities**

The task involves answering questions about curricular knowledge in art, music, and literature.

On a musical scale, how many notes are in an octave?

**Figure 1.1 Continued**

Item content was selected to provide a broad sampling of achievement rather than an in-depth assessment of any one area. Each broad area was designed to measure a hierarchy of abilities ranging from lower-order, less complex tasks, such as the Spelling test, to higher-level, more complex tasks, such as Applied Problems, a measure of math problem solving. Broad measurement of these important achievement areas assists examiners in identifying present performance levels, strengths and weaknesses, and an individual's present instructional needs. In addition, once an area of need has been identified, more in-depth testing can be performed to identify specific instructional objectives using additional norm-referenced, curriculum-based, or informal assessments. Table 1.3 shows the clusters available in the WJ IV ACH.

**Table 1.3 Clusters Available in the WJ IV ACH**

Curricular Area	Clusters in the Standard Battery	Clusters Requiring a Test From Extended Battery
<b>Reading</b>	Reading Broad Reading Basic Reading Skills Reading Fluency	Reading Comprehension Reading Comprehension–Extended Reading Rate
<b>Math</b>	Mathematics Broad Mathematics Math Calculation Skills	Math Problem Solving
<b>Writing</b>	Written Language Broad Written Language Written Expression	Basic Writing Skills
<b>Cross-Domain Clusters</b>	Academic Skills Academic Fluency Academic Applications Brief Achievement Broad Achievement	Academic Knowledge Phoneme-Grapheme Knowledge

## CHANGES FROM THE WJ III ACH TO WJ IV ACH

Examiners who are familiar with the WJ III ACH will find it easy to learn the overall structure and organization of the WJ IV ACH. Rapid Reference 1.2 provides a summary of the major differences between the WJ III ACH and WJ IV ACH. Rapid Reference 1.3 lists the new tests and clusters available in the WJ IV ACH.

### *Rapid Reference 1.2*

#### **WJ IV ACH Major Changes From WJ III ACH**

- Provides updated norms.
- The Standard Battery has three parallel forms (Forms A, B, and C) with one form of the Extended Battery that is designed to be used with any of the Standard Batteries.
- There are 20 tests, 11 in the Standard Battery and 9 in the Extended Battery.
- The WJ IV ACH has seven new or expanded tests: Test 8: Oral Reading, Test 12: Reading Recall, Test 13: Number Matrices, Test 15: Word Reading Fluency, Test 18: Science, Test 19: Social Studies, and Test 20: Humanities.
- There are 22 clusters, including 8 new clusters: Reading, Reading Comprehension-Extended, Reading Fluency, Reading Rate, Written Language, Mathematics, Brief Achievement, and Broad Achievement.
- Fifteen clusters are available from the Standard Battery tests and seven additional clusters are available when using the Extended Battery.
- The oral language tests (Picture Vocabulary, Oral Comprehension, Understanding Directions, and Sound Awareness) have been moved into the WJ IV OL. Story Recall has been moved into the WJ IV COG.
- There is one audio-recorded test in the WJ IV ACH (Test 16: Spelling of Sounds).
- Three test names were changed to more accurately reflect the task: Reading Fluency is now Sentence Reading Fluency, Writing Fluency is now Sentence Writing Fluency, and Math Fluency is now Math Facts Fluency.
- The procedures for evaluating ability/achievement comparisons and intra-ability variations have been simplified with increased flexibility for the examiner. Within the WJ IV ACH, two types of intra-ability variations are available: intra-achievement and academic skills/academic fluency/academic applications. One type of ability/achievement comparison is available: a comparison of the Academic Knowledge Cluster to other academic domains. Additional options are available when also administering tests from the WJ IV COG and/or the WJ IV OL.

## *Rapid Reference 1.3*

### **New WJ IV ACH Tests and Clusters**

#### *Seven New or Expanded Tests*

- Oral Reading
- Reading Recall
- Number Matrices
- Word Reading Fluency
- Science
- Social Studies
- Humanities

#### *Eight New Clusters*

- Reading
- Reading Comprehension–Extended
- Reading Fluency
- Reading Rate
- Written Language
- Mathematics
- Brief Achievement
- Broad Achievement

## **DON'T FORGET**

### **Reminders to Examiners**

- The Standard Battery has three forms and the Extended Battery has one form.
- The oral language tests are now included in the WJ IV OL.
- The Academic Knowledge cluster may be used to predict achievement.
- Important additional diagnostic information can be obtained by using the co-normed WJ IV COG and WJ IV OL.
- It is not necessary to administer all of the WJ IV ACH tests.

## **THEORETICAL FOUNDATIONS**

The WJ IV is based on current theory and research on the structure of human cognitive abilities. The theoretical foundation is derived from the Cattell–Horn–Carroll theory of cognitive abilities (CHC theory). Although this is most

commonly discussed in relation to the WJ IV Tests of Cognitive Abilities, applying CHC theory to the WJ IV Tests of Achievement provides a common framework for describing performance and interpreting results. This creates a powerful tool for measuring human performance across the continuum of cognitive abilities, oral language, and achievement.

CHC theory is a combination of two research-based theories: *Gf-Gc* theory, based on the work of Drs. Raymond Cattell and John Horn, and three-stratum theory, based on the work of Dr. John Carroll. Both theoretical models focus on multiple broad abilities, each of which subsumes several narrow cognitive abilities. For more information about these theories, consult the *WJ IV COG Examiner's Manual* (Mather & Wendling, 2014b), the *Technical Manual* (McGrew, LaForte, & Schrank, 2014), Schneider and McGrew (2012), and McGrew and Wendling (2010). The WJ IV measures nine broad abilities: comprehension-knowledge (*Gc*), fluid reasoning (*Gf*), visual processing (*Gv*), short-term working memory (*Gwm*), long-term retrieval (*Glr*), cognitive processing speed (*Gs*), auditory processing (*Ga*), reading/writing (*Grw*), and quantitative knowledge (*Gq*). (See Rapid Reference 4.6 in Chapter 4 for definitions of these broad abilities.) The WJ IV ACH includes several different measures of these broad abilities. Table 1.4 shows the broad and narrow abilities that are measured by each of the 20 WJ IV ACH tests.

**Table 1.4 Broad and Narrow Abilities Measured by the WJ IV ACH**

Broad CHC Ability	Standard Battery Tests (Primary Narrow Abilities)	Extended Battery Tests (Primary Narrow Abilities)
Reading/Writing: Reading ( <i>Grw</i> )	Test 1: Letter-Word Identification (Reading decoding)	Test 12: Reading Recall (Reading comprehension)
	Test 4: Passage Comprehension (Reading comprehension, Verbal [printed] language comprehension)	Test 15: Word Reading Fluency (Lexical knowledge, Semantic fluency)
	Test 7: Word Attack (Reading decoding, Phonetic coding)	Test 17: Reading Vocabulary (Verbal [printed] language comprehension, Lexical knowledge)
	Test 8: Oral Reading (Reading accuracy, Prosody)	
	Test 9: Sentence Reading Fluency (Reading speed, Reading comprehension)	

(continued)

**Table 1.4 (Continued)**

Broad CHC Ability	Standard Battery Tests (Primary Narrow Abilities)	Extended Battery Tests (Primary Narrow Abilities)
Reading/Writing: Writing ( <i>Grw</i> )	Test 3: Spelling (Spelling ability)	Test 14: Editing (Language development/English usage)
	Test 6: Writing Samples (Writing ability)	Test 16: Spelling of Sounds (Spelling ability, Phonetic coding)
	Test 11: Sentence Writing Fluency (Writing speed, Writing ability)	
Quantitative Knowledge ( <i>Gq</i> )	Test 2: Applied Problems (Quantitative reasoning, Math achievement, Math knowledge)	Test 13: Number Matrices (Quantitative reasoning)
	Test 5: Calculation (Math achievement)	
	Test 10: Math Facts Fluency (Math achievement, Numerical facility)	
Comprehension- Knowledge ( <i>Gc</i> )		Test 18: Science (General information/science)
		Test 19: Social Studies (General information/ geography achievement)
		Test 20: Humanities (General information/cultural information)
Auditory Processing ( <i>Ga</i> )	Test 7: Word Attack (Phonetic coding)	Test 16: Spelling of Sounds (Phonetic coding)
Long-term Retrieval ( <i>Gr</i> )		Test 12: Reading Recall (Meaningful memory)
Fluid reasoning ( <i>Gf</i> )		Test 13: Number Matrices (Inductive, Deductive)
Cognitive Processing Speed ( <i>Gs</i> )	Test 9: Sentence Reading Fluency	Test 15: Word Reading Fluency
	Test 10: Math Facts Fluency	
	Test 11: Sentence Writing Fluency	