

NATIONAL HEALTH AND NUTRITION SURVEY III
COGNITIVE TESTING FOR CHILDREN
MEC INTERVIEWER MANUAL

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1. COGNITIVE TESTING FOR CHILDREN

1.1 Introduction

The cognitive testing for children is designed to evaluate the mental functioning of children of ages 6 to 16 years. Specifically, this component consists of a series of four tests, two of which are subscales of the Wechsler Intelligence Scale for Children (WISC-R) and two of which are subtests of the Wide Range Achievement Test (WRAT-R). The Block Design and Digit Span subtests of the WISC-R are to be administered first. Subsequently, the Reading and Arithmetic subtests of the WRAT-R are to be administered.

Since the cognitive testing portion of the MEC Interview follows directly after the administration of the MEC Questionnaires, interviewers can build upon the rapport developed earlier in the interview. Although these tests were selected to be as nonthreatening as possible to the respondents, interviewers must follow the testing protocols to ensure that reliable and valid tests results are obtained. Proper administration of these tests requires the use of basic communication skills and careful adherence to the step-by-step procedures given below. Basic communication skills are essential in order to gain the attention and cooperation of the children and adolescents and to motivate them to complete the series of tests designated for their respective age groups. Finally, the use of standardized testing procedures for administering the subtests, as well as for recording test data and scoring results, is critical in order to maximize the quality of the data obtained.

1.2 General Testing Procedures

1.2.1 Establishing and Maintaining Rapport

A brief introduction to the cognitive testing portion will ease the transition from responding to the series of health-related questions on the MEC Questionnaire to focusing on the cognitive tasks. The interviewer should begin the cognitive testing by making the following transition statement:

Script: Now we are going to do some tasks that ask you to solve different kinds of problems. I will explain each task as we come to it. Please just do the best that you can.

Since the cognitive testing follows the administration of the MEC Questionnaire, most respondents will already feel comfortable with the interviewer. However, if rapport has not been established, it may be helpful to engage the child or adolescent in some informal conversation about his/her hobbies or interests. In general, this conversational period should be kept relatively brief in the interest of time, but it is important not to begin testing until the child or youth seems relaxed enough to give his/her maximal effort.

If the respondent expresses any concern about the tests or his/her ability to perform well, every effort should be made to clarify the nature and purpose of the tests and to allay any uncertainty or tension. Maintaining a calm and easy conversational manner while interacting with the child will enhance the cooperation of the child while also relieving his/her test-taking anxiety. Notice that the introductory script does not use the word test but rather frames the situation as a series of tasks for which instructions will be provided. In this way test anxiety is minimized.

The manner in which the introductory statement to the cognitive tests is presented influences the respondents' disposition toward taking the tests. Thus, it is very important to motivate each child or youth to do the best that s/he can on these tests. Concentration is critical to enhancing test performance. Care should be taken to administer these tests in a quiet, well-ventilated, and well-lit environment. The respondent should be seated comfortably at a table which is below his/her line of vision. Since visual and hearing problems can negatively influence assessment, it is mandatory to ensure that every respondent can see the testing materials and hear the test instructions. Always speak directly to the respondent. If s/he seems to have any difficulty hearing you, try to speak an octave lower and slightly louder. Try to avoid shouting as this may cause interference with tests being administered in the adjacent rooms.

1.2.2 Standardized Testing Procedures

The proper use of the WISC-R and the WRAT-R subtests requires a thorough familiarity with the specific procedures for administering these tests, as well as an appreciation for general standardized testing procedures. Each respondent must receive the same orientation to the cognitive tasks and the precise instructional sets given in the test protocols. Moreover, the nature of the motivational cues and the amount of positive reinforcement given during test-taking should be consistent across respondents.

Basically, encouragement to do one's best and supportive comments to maintain a positive test-taking attitude are acceptable forms of feedback during testing. For instance, such comments as, "You're doing fine.", or "That's okay, just do your best." can be used liberally. If a young child expresses concern about his/her performance or seems frustrated, it is appropriate to encourage him/her by saying, "That one was a little hard. You'll be able to do it when you are older." or a similarly supportive comment, and then proceed with the next item.

Children vary widely in their responses to reinforcement, and it is important to attend to the specific needs of the child. However, special encouragement which provides clues or biases the responses must be avoided. Furthermore, dissatisfaction, disapproval, and disappointment should never be shown during testing. Maintaining a neutral and professional manner, while still being sensitive to each respondent, promotes the highest quality data.

In sum, standardized testing procedures permit a high degree of consistency in test administration across respondents and between interviewers. The primary objective is to obtain results which are directly comparable within each age group. Part of the standardization involves following the designated sequence of testing. Cognitive testing for children of ages 8 to 16 years of age follows directly after the administration of the MEC Youth Questionnaire. For 6- and 7-year olds, the parent or other responsible adult will first complete the MEC Proxy Questionnaire and then the child will be introduced to the cognitive tests. Since children of this age will not have spent any previous time with the interviewer, a few extra minutes should be devoted to establishing rapport and helping them to understand their part in the interview. Give the child sufficient time to adjust to the surroundings and to ask a few questions if it helps them to settle into the testing situation.

Once the cognitive portion has been properly introduced to the child or youth, each of the four tests should be administered in the proper sequence. Specifically, the order of administering the four cognitive tasks is as follows:

Block Design (WISC-R)

Digit Span (WISC-R)

Reading (WRAT-R)

Arithmetic (WRAT-R)

The step-by-step procedures given in the protocol sections below should be followed exactly. Particular attention must be given to the age-specific variations for each subtest; children of different ages are started at different points in the WISC-R subtests. Moreover, the Reading subtest of the WRAT-R has two levels; Level 1 is for children under 12 years and Level 2 is for children 12 and older. Finally, specific procedures for recording responses and for scoring the results are given for each of the four cognitive tasks. Some tasks require the use of a stopwatch for timing when administered manually. Timing rules are critically important to proper administration of these particular subtests. Similarly, scoring rules must be followed precisely to avoid the use of subjective interpretation of the child's response. The record forms for recording responses to each subtest will be described below. Familiarity with all of the following protocols is essential to ensuring that the most reliable and valid results are obtained.

1.3 Testing Protocol for Administration of the WISC-R

1.3.1 Introduction to the WISC-R

The WISC-R is a psychometric device, or set of standardized questions and tasks, designed to assess global intelligence, a multidetermined and multifaceted trait rather than an independent, uniquely-defined trait. This global assessment of intelligence does not measure a kind of ability per se, rather it reflects an individual's overall capacity for purposive and useful behavior. Intelligent behavior involves not only cognitive skills or processes but also certain non-intellective factors, including personality traits, drive, motivation, attitudes and values. The WISC-R is designed to tap this more global concept of intelligence and, when given in its entirety, it can be used to estimate an individual's Verbal, Performance, and Full Scale IQ. However, for purposes of this survey, only two of the WISC-R subtests are being administered to assess cognitive functioning in children. Thus, no attempt will be made to infer Full Scale IQ based on an average of scaled scores on these two tests as such inferences may be highly unreliable.

1.3.2 Protocols

The two subtests of the WISC-R which are being administered are described below. Included are the materials needed for each test, the instructions to be given to the respondent, and the scoring procedures for the manual administration. The instructions for recording responses and scoring must be

followed precisely.

1. **Block Design**

a. Materials:

9 blocks (cubes) colored red on two sides, white on two sides, and red/white on two sides; 11 cards with printed designs bound into a booklet; stopwatch.

b. Instructions:

Instructions vary for the different age groups and are specified below. The relevant age is the child's age on the date of testing. Protocol must be strictly adhered to in order to administer the task correctly. Instructions should be read word-for-word for the respective age groups as given below in the Procedures section.

c. Procedures:

Children of ages 6 and 7 begin with Item 1; children of ages 8 to 16 begin with Item 3. If a child of ages 8-16 fails the first trial of Design 3, then s/he is given second trial. Regardless of the outcome of the second trial, s/he is given Designs 1 and 2 before proceeding with the test.

For Designs 1 and 2, the child works directly from block models, which are set up by the examiner. The models should be properly oriented, with the edge of the model corresponding to the unbound edge of the card in the booklet. For all other designs, the child works from the booklet, and each design is presented so that the unbound edge of the card is facing the child. The blocks should be placed on the table with a variety of surfaces facing up; only one of the four blocks should have the red/white side showing, or three of the nine blocks for designs that require the complete set.

6-7 yrs. DESIGN 1 Holding four blocks in hand, say, "See these blocks? They are all alike. On some sides they are all red; on some, all white; and on some half red and half white." After turning the blocks to show the different sides, say, "I am going to put them together to make something with them. Watch me."

Slowly arrange the blocks to form Design 1 without exposing the card to the child. While the model remains intact, give four other blocks to the child and say, "Now make one just like mine." Start timing and allow the child as much as 45 seconds to complete the task. If the child finishes within the time limit, proceed to Design 2.

If the child fails, say, "Watch me again." After demonstrating a second time with the child's four blocks, mix up the blocks again while leaving the original model intact, and say, "Now you try it again and be sure to make it just like mine." Begin timing again, and allow 45 seconds for the second trial.

DESIGN 2 Scramble all of the blocks before beginning Design 2. Assemble the model behind the screen and present it to the child, saying, "Now make one like this. Do it all by yourself this time." Begin timing and allow 45 seconds for completion. Once again, if the child fails on the first trial, scramble the blocks that the child was using and demonstrate how to make the design after saying, "Watch me do it. Leave the original model intact and scramble the child's blocks and say, "Now you try it." Begin timing and allow 45 seconds.

DESIGN 3 Mix up the child's blocks and remove the model. In place of the model, put the card marked 3, and say, "This time we are going to put the blocks together to make them look like this picture." Point to the card and say, "Watch me first." Slowly make the design with the child's blocks. After demonstrating, say, "You see, the tops of these blocks look the same as this picture." After mixing up the blocks used in the demonstration, say, "Now you look at the picture and make one just like it with these blocks. Go ahead." Allow 45 seconds for completion. If the child is unable to complete the task correctly, scramble the blocks and say, "Watch me again." Then remake the design and mix up the blocks before repeating the trial. Say, "Go ahead. See if you can do it this time." Begin timing and allow 45 seconds.

Proceed with the instructions for **DESIGNS 4-11** for the 6 to 7 year olds until 2 consecutive failures. An item is considered failed only if both trials are failed for the first three designs. Designs 4-11 are given one trial only. For children aged 8-16, use the alternative instructions below for Design 3 which is the first design given to that age group.

8-16 yrs. DESIGN 3 Holding four blocks in hand, say, "See these blocks? They are all alike. On some sides they are all red; on some, all white; and on some, half red and half white." Turn the blocks to show the different sides, and say, "They can be put together to make a design like the one you see on the card. Watch me." Slowly demonstrate how to make the design, then scramble the blocks and hand them to the child and say, "Now you make one like the card. Go ahead." Begin timing and allow 45 seconds for completion.

If the child fails on the first trial, allow a second trial. Mix up the blocks and say, "Watch me again." Demonstrate how to make the design, using the child's blocks, then scramble them again, and say, "Go ahead. See if you can do it this time." Begin timing and allow 45 seconds.

Note if the child is able to successfully complete the design on the first trial, give him/her full credit for Designs 1 and 2 (2 points each) and go to Design 4. If the child passes only the second trial of Design 3, or if s/he fails both, go back and administer Designs 1 and 2 before proceeding. Follow the directions except begin Design 1 with the part that states, "Slowly arrange the four blocks..." If the child successfully completes Designs 1 and 2, continue with Designs 4-11 until two consecutive designs are failed.

DESIGNS 4-11 Give the child four blocks to work with and be sure to scramble them before starting. Place the card marked 4 in front of the child and say, "Now make one like this. Try to work as quickly as you can. Tell me when you have finished." Begin timing and allow 45 seconds for each design. When the child has finished or the time limit is reached, scramble the blocks once more and present the next design. For each card presented, repeat, "Now make one like this. Try to work as quickly as you can. Tell me when you have finished."

Begin timing and allow the specified number of seconds for each design. Continue until the child makes two consecutive failures.

For Design 9, be sure to give the child all nine blocks, and say, "Now make one like this, using 9 blocks."

d. Transition:

When the child has met criteria on the Block Design and you are ready to administer the Digit Span, say to the respondent; "OK, now we are going to do something different." This will let the child or youth know that you will now be moving to a different task.

e. Scoring:

The time limits permitted for each design are given in the table in Exhibit 1-1. Note that timing always begins as soon as the last word of the directions is given. For Designs 1-3, begin timing again for Trial 2 if a second trial is administered. Record the exact time it takes the child to complete each design. Note that bonus points are given for quick and accurate completion of Designs 4-11, so it is essential to time accurately. Any design which does not match the model or card precisely, as well as any failure to complete a design successfully within the specified time limit, is counted as a failure.

Exhibit 1-1

Time Limits - Block Design

Design	Time	Score
1,2,3	1-45"	2 points-Pass first trial
1,2,3	1-45"	1 point-Pass second trial
1,2,3	1-45"	0 points-Fail both trials
4	1-10"	7 points
4	11-15"	6 points
4	16-20"	5 points
4	21-45"	4 points
5,6,7	1-10"	7 points
5,6,7	11-15"	6 points
5,6,7	16-20"	5 points
5,6,7	21-75"	4 points
8	1-15"	7 points
8	16-20"	6 points
8	21-25"	5 points
8	26-75"	4 points
9(9 blocks)	1-25"	7 points
9	26-35"	6 points
9	36-55"	5 points
9	56-120"	4 points
10(and 11)	1-40"	7 points
10(and 11)	41-55"	6 points
10(and 11)	56-75(80)"	5 points
10(and 11)	76(81)-120"	4 points

Rotation of a design 30 degrees or more is also considered a failure. Correct any rotational error the first time one occurs by saying, "But you see it goes this way" and rotate the blocks into the correct position. Give this kind of help only once during the test.

Designs 1-3. Score 2 points for passing on Trial 1 and 1 point for passing on Trial 2. The time limits are 45 seconds for each trial.

Designs 4-11. Score 4 points for passing within the time limit plus a maximum of 3 bonus points per item for perfect completion in shorter amounts of time as specified in Exhibit 1-1. The smaller numbers on top refer to the range in seconds for perfect performance while the larger number below is the score given for completing a perfect design in that particular amount of time. The maximum score for Block Design is 62 points.

2. **Digit Span**

a. Materials:

Digits given on the Record Form shown in Exhibit 1-2.

b. Instructions:

Digits Forward.

Instructions to the respondent:

"I am going to say some numbers. Listen carefully, and when I am through say them right after me."

c. Procedure:

Digits Forward. Begin at Item 1 for all children. The digits should be given at a rate of one per second. Administer both trials of each item, even if the child passes on Trial 1. Note that there are two parts to the Digit Span subtest--Digits Forward and Digits Backward. These two parts are administered separately. Give each child Digits Backward even if s/he obtains a score of 0 on Digits Forward. Administer Digits Forward until both trials of an item are failed. Then, proceed with Digits Backward until both trials of an item are failed. Begin with Item 1 on each part. Be sure to read the appropriate instructions for each part.

Digits Backward. For Digits Backward, the instructions to the respondent are as follows:

"Now I am going to say some more numbers but this time when I stop I want you to say them backwards. For example, if I say 9-2-7, what would you say?" Wait for the child to answer. If s/he answers correctly (7-2-9), say, "That's right." and proceed to Item 1. Once again, the digits are read at a rate of one per

second and both trials of each item are administered even if the child passes Trial 1.

If the child answers the example incorrectly, say, "No, you would say 7-2-9. I said 9-2-7, so to say it backwards you would say 7-2-9. Now try these numbers. Remember, you are to say them backwards. 5-6-3." Whether or not the child responds correctly with the second example (5-6-3), proceed to Item 1. Give no help on the second example or on any items that follow.

d. Transition:

When the child has met criteria on Digits Forward and Digits Backward and you are ready to administer the WRAT-R say to the respondent; "OK, now we are going to do something different."

e. Scoring:

The maximum score for this subtest is 28 points.

Digits Forward. Score each item 2,1, or 0, as follows:

2 points if the child passes both trials; 1 point if the child passes only 1 trial; 0 points if the child fails both trials.

Maximum score for Digits Forward=14 points.

Digits Backward. Score each item 2,1, or 0, as follows:

2 points if the child passes both trials; 1 point if the child passes only 1 trial; 0 points if the child fails both trials.

Maximum score for Digits Backward=14 points.

Exhibit 1-2

Digit Span

<u>Item</u>	<u>Trial 1</u>	<u>Trial 2</u>
1.	3-8-6	6-1-2
2.	3-4-1-7	6-1-5-8
3.	8-4-2-3-9	5-2-1-8-6
4.	3-8-9-1-7-4	7-9-6-4-8-3
5.	5-1-7-4-2-3-8	9-8-5-2-1-6-3
6.	1-6-4-5-9-7-6-3	2-9-7-6-3-1-5-4
7.	5-3-8-7-1-2-4-6-9	4-2-6-9-1-7-8-3-5

1.4 Testing Protocol for Administration of the WRAT-R

1.4.1 Introduction to the WRAT-R

The Wide Range Achievement Test (WRAT) was originally standardized in 1936 and was designed as an adjunct to intelligence tests. The test subsequently underwent five revisions. The 1984 revision, WRAT-R, reflects many recent advances in psychometric theory which have been incorporated to enhance the validity and reliability of the instrument as a tool for assessing simple academic coding skills. In its full form, the WRAT-R consists of two separate versions, one called Level 1 which is designed for use with children of ages 5 years through 11 years, 11 months, and another version called Level 2 which is intended for use with older children of ages 12 years and above.

The three subtests at each level are as follows:

- a. Reading which involves recognizing and naming letters and pronouncing words out of context.
- b. Spelling which entails copying marks that resemble letters, writing one's name, and writing single words from dictation.
- c. Arithmetic which requires counting, reading number symbols, solving problems orally, and performing written computations.

The WRAT-R was purposely constructed to minimize the effects of comprehension on test performance. This feature permits a distinction between problems which are attributable to the inability to learn codes needed for the acquisition of certain skills and those difficulties due to the inability to derive meaning from codes.

1.4.2 Protocols

The two subtest of the WRAT-R which are being included in the Cognitive Testing for Children are described below. Note that for purposes of the present survey, only the Reading and Arithmetic subtests of the WRAT-R are being administered to children of ages 6 to 16 years. Level

1 and Level 2 subtests are described separately. Included below are the materials needed to administer each test, instructions for the interviewer and the respondent, and scoring procedures.

Note that there are separate Record Forms for Levels 1 and 2 testing. The first page of the Record Form for each level is primarily for recording the responses to the Spelling subtest, which is not being administered during the Cognitive Testing. However, the name of the child, the date of the test administration, the child's date of birth and sex should be filled in on the cover of the Record Form for the appropriate level. Enter your ID number and place an SP ID sticker on this page before beginning administration of the Reading subtest.

1. **Reading**

a. Materials:

The pronunciation guides for Reading subtests, Levels 1 and 2, are shown in Exhibits 1-3 and 1-4, respectively. The WRAT-R Level 1 Reading subtest is presented on page 4 of the WRAT-R test form. The WRAT-R Level 2 Reading subtest is presented on page 4 of the WRAT-R test form for Level 2.

b. Procedure:

Note that Level 1 Reading subtest is administered to children of ages 5 to 11 years, 11 months, while the Level 2 Reading subtest is given to children of age 12 and over. Within a given level of testing, moreover, the instructions may vary according to the age of the child.

The procedures and instructional sets are given separately for each level and for different age subgroups within a level.

Level 1 The Reading subtest of the WRAT-R at Level 1 consists of 3 pre-reading parts and one formal reading section. Children younger than age 8 begin at the pre-reading section. Children of ages 8 years and older begin with the formal reading section. If a mispronunciation occurs on the first line of the formal section, allow the child a second chance and if the word is not correctly pronounced on the second try, then administer the pre-reading section. The pre-reading section requires the child to name 2 letters in a previously written or printed name (2 points), to identify 10 letters by form (10 points), and to name 13 letters of the alphabet (13 points). If a child of age 8 or older makes no errors on the first line of the formal reading section, then full credit is given for the pre-reading section without administering it.

In all, the formal reading part requires the child to pronounce 75 words (75 points) or to read until ten consecutive errors occur. Note that the Reading

subtest is intended to be a measure of word recognition and therefore, **unusual pronunciations due to regional variations, foreign accents or poor diction are acceptable provided the peculiarity is consistent throughout the test.**

Ages 8-11 yrs. Level 1. FORMAL READING.

Point to the first word on the first line of the Record Form (cat) and say, "Look at each word carefully and say it aloud. Begin here (point) and read the words across the line so I can hear you. When you finish the first line, go to the next line and then the next." For younger or more limited children it may be helpful to point to each word with a pencil as they attempt to read. The time limit for pronouncing each word is ten seconds. When the time limit is up, prompt the child to the next word, if necessary, by saying, "Next" after the ten seconds. If the child refuses to try to pronounce a word within the time limit, it is acceptable to encourage a response by saying, "Try the word anyway." or "Take a guess at it."

If the child reads too quickly for you to score accurately, slow him/her down by saying "you're reading a little too fast for me, would you slow down." Also be sure the child does not begin reading before the entire instructions.

When the first error occurs, ask the child to say the word again. Score it correctly if the child pronounces it correctly the second try. Thereafter, score the first response as right or wrong unless the child spontaneously corrects him/herself within the time limit. Only ask the child to repeat a response if it is not clear or it is unscorable. Continue until the child makes 10 consecutive errors.

Ages 6-7 yrs. (8-11 yrs.) PRE-READING.

Whenever failure occurs on the first line of the formal section for children 8 years and older, the three pre-reading tests are administered before proceeding.

The pre-reading tests are also given to all children of ages 6 years to 7 years, 11 months. These three parts are administered as follows:

1. Naming 13 letters. Say to the child, "Read these letters aloud". Point to the first letter in the second row of capital letters on page 4 of the Record Form. Then ask, "What is this?" or "What do you call this?" Point to each letter consecutively as the child reads it. Note that the time limit is 10 seconds per letter, and if the child names all letters correctly, then the next two parts of the pre-reading section can be omitted. Full credit is given for parts 2 and 3. If not all letters are named correctly, proceed with parts 2 and 3 as directed.
2. Recognizing 10 letters. Cover the word list with a sheet of paper, point to the first letter (A) in the top row of capital letters and say, "Find one just like this down here in this line." (Point to the row of letters underneath.) Repeat the instructions if necessary. Point to each letter and allow ten seconds per letter. Continue with part 3.

3. Two letters in name. Point to the first letter in the name which the child has written on page 1 of the test blank and say, "What do you call this letter?" or "What is this letter? And this one?" Stop after the second correctly named letter and allow only ten seconds per letter.

Level 2 The WRAT-R Reading subtest at Level 2 consists of 2 pre-reading parts and 1 formal reading section. All children of ages 12 and over begin with the formal section. If a child obtains a score of 10 points or less in the formal part, give the pre-reading parts as described below.

Ages 12-16. Level 2. FORMAL READING.

Before starting the formal section, study the pronunciation of the 74 words, using the pronunciation guide shown in Exhibit 8.4. Point to the first word "mild" of the reading list Level 2 and say, "Look at each word carefully and say it aloud. Begin here. (point) and read the words across the page so I can hear you. When you finish the first line, go on to the next line, and then the next etc."

Again, be sure the child reads slowly and does not begin before hearing the instructions.

The first time a reading error is made, ask the child to say the word again. The response is scored as correct if the child pronounces it correctly on the second try. Regardless of whether or not the child corrects the pronunciation on the second try, continue the formal reading section until 10 consecutive errors are made. Ask for a second pronunciation only when the first error occurs. Thereafter, the first response given is scored as right or wrong unless the child spontaneously corrects the error within the time limit. If the response is unclear or unscorable, ask the child to repeat the word. Do not probe or question answers given. Remember 10 seconds is allowed per word and the test is discontinued when 10 consecutive errors are made.

Ages 12-16. Level 2. PRE-READING.

When a child scores 10 points or less in the formal reading part, ask him/her to name 2 letters in his/her name and to name the 13 capital letters printed above the word list. Follow the same instructions for these two pre-reading subtests as given for Level 1.

- c. Summary of Procedures for WRAT-R Reading.

An outline summary of procedures for administration of the WRAT-R Reading Subtest is presented in Appendix A.

d. Recording Responses and Scoring:

FORMAL READING

Level 1 Underline the first letter of a word if it is pronounced correctly; cross out the first letter if it is mispronounced. If the child first mispronounces a word and then corrects his/her mistake within the time limit, cross out the first letter and underline the second letter and score as correct. If the child first pronounces a word correctly, then mispronounces it, underline the first letter, cross out the second letter and score as incorrect.

PRE-READING

Level 1 Score one point for each letter of the alphabet named correctly in part 1 (13 points), 1 point for each letter identified correctly in part 2 (10 points), and 1 point for each letter of the named correctly (2 points). Remember when parts 2 and 3 are omitted after part 1 is done correctly, give full credit for the parts not administered.

The total possible raw score for Level 1 Reading subtest is 100 points.

FORMAL READING

Level 2 Record responses to Level 2 in the same manner as directed in Level 1. Score 1 point for each word correctly pronounced, making a total score of 74 points possible.

PRE-READING

Level 2 Give the child 1 point for each letter correctly named, yielding a possible total score of 15 points for the pre-reading section. Be sure to credit the points for the pre-reading section if is omitted because of an adequate word reading level.

The total maximum raw score for Level 2 Reading subtest is 89 points.

2. **Arithmetic**

a. Materials:

The WRAT-R Level 1 Arithmetic subtest is found on pages 2 and 3 of the WRAT-R Level 1 Record Form; the WRAT-R Level 2 Arithmetic subtest is found on pages 2 and 3 of the WRAT-R Level 2 Record Form.. The Answer Keys for the two levels of Arithmetic subtests are given in the WRAT-R manual.

b. Procedure and instructions to respondent:

Note that the two levels of the Arithmetic subtests are designed for the same age groups as the two levels of the Reading subtests. Directions are given separately below for each level of the Arithmetic subtest.

Level 1 This subtest consists of an oral section with 7 parts and a written section

with one part. Children of ages 6 to 11 years, 11 months are given Level 1 of the WRAT-R Arithmetic test..

Ages 6-7 yrs. Level 1. Arithmetic. WRITTEN PART.

Start the test with the written computations. For younger children, point to the first problem, and say, "Read this." If the problem is read correctly, say, "What is the answer?" When the child gives the answer, say, "Write it down on this line (point). Then say, "Now read this (point) and put the answer on that line (point). Then read all the other problems in this row (point) and put the answers on or under the lines." Begin timing after the third written problem and allow 10 minutes for the 2 pages of written computations.

If a child is unable to read the first problem, stop the written part and administer the oral parts according to the directions given below. Also note that children of ages 6 through 7 years, 11 months and older children who obtain a score of less than 5 points on the written part are given the oral part.

Ages 6-7 yrs. (8-11 yrs.) Level 1. ORAL PART.

1. Counting 3 ducks. While pointing to the ducks printed at the top of page 2 of the test form, say, "Point with your finger and count these ducks one by one. Beginning here (child's left) and going this way." (Motion to the right). "Count the ducks aloud so I can hear you, and tell me how many ducks there are."
2. Counting 5 boxes. Pointing to the boxes on the top of page 2, say, "Now point to each of these boxes and count aloud. Tell me how many boxes there are."
3. Counting 15 dots. Pointing to the dots printed at the top of page 2 of the form, say, "Point with your finger and count these dots one by one beginning here. Count them aloud so I can hear you, and tell me how many dots there are."
4. Reading numbers. Pointing to the numbers (3,5,6,17,41), say, "Read these numbers. What is this? And This?"
5. Showing fingers. Say, "Show me 3 fingers. Show me 8 fingers."
6. Which number is more. Say, "Which is more, 9 or 6? Which is more 42 or 28?"
7. Add and subtract. Ask: a. "If you have 3 pennies and spend 1 of them, how many have you left?" b. "How many are 3 and 4 apples?" c. "Jack had 9 marbles, he lost 3 of them. How many were left?"

Ages 8-11 yrs. Level 1. WRITTEN PART.

For children 8 years and older, give the following instructions: "This is an arithmetic test. Look at the problems printed below the heavy line and going on to the next page. I'd like to know how many of the problems you can figure out. Look at each problem carefully to see what you are supposed to do--add, subtract, multiply, or divide--and then put down your answer in the space on or under the lines. Should you wish to figure on the paper, you may use the empty spaces or the sides to write on. There is also space at the bottom of page 3. First, do the top row, then the second row, then the third, etc. The problems get more difficult as you go down the page and on to the next. Don't spend too much time on any one problem. You can skip a problem if it is too difficult for you. But do as many as you can one by one. You will have 10 minutes. Now, go ahead and do as many as you can. Don't forget to go on to the second page of problems."

Level 2 The Level 2 Arithmetic consists of an oral section with 3 parts and a written section with one part. Again, the written part is administered first. Any child who scores 5 points or less in the written part at the end of the ten-minute time limit is given the oral section. The three parts of the oral section--Counting 15 dots, Reading numbers 3,5,6,17,41, and Adding and subtracting--are identical to those parts in the oral section of Level 1. Follow the directions given earlier for those parts if administration is required.

For administering the written section, say, "I'd like to know how many of the problems on these two pages you can figure out. Look at each problem carefully to see what you are supposed to do--add, subtract, multiply, or divide--and then put down your answer in the space on or under the line of the problem. Should you wish to figure on the paper, you may use the empty spaces or the margins to write on. First do the top row of the first page, then the second row, and then the third row, etc. The problems get more difficult as you go down the page and to the next. Don't spend too much time on any one problem. You can skip a problem if it is too difficult for you, but do as many as you can one by one. You will have 10 minutes. Now, go ahead and do as many as you can. Don't forget the second page."

c. Summary of Procedure for WRAT-R Arithmetic:

An outline summary or procedures for administration of the WRAT-R Arithmetic Subtest is provided in Appendix A.

d. Scoring:

Level 1 The first three parts of the oral section of Level 1 Arithmetic count 1 point each; part 4 counts 5 points; parts 5 and 6 count 2 points each; and part 7 counts 3 points. Award full credit if performance on the written part precludes administration of the oral section. When recording responses for the written part, circle correct answers and cross out incorrect ones. One point is given for each correct answer obtained within the time limit. The total possible score for the written part is 44 points, plus 15 points as the total possible score on the oral

section, allowing 59 total possible points.

Level 2 For the oral section, score 1 point for counting up to 5 dots correctly and 1 point for counting all 15 dots, plus 5 points for reading each number correctly, and 3 points for solving the 3 problems. Thus, the total possible score on the oral section is 10 points.

For the written section, there are 56 computational problems. Score one point for each correct answer given within the time limit.

The total raw score possible for Level 2 of the Arithmetic subtest is 66 points. Be sure to credit 10 points if the oral section does not need to be administered.

1.5 Other General Testing Considerations

1.5.1 Difficult Respondents

Older children may try to take charge of the testing situation. Some latitude may be permitted in the interest of maintaining rapport, but it is imperative to maintain enough control to ensure that a valid and reliable assessment is made. Any negativism should be dealt with as tactfully as possible in order to encourage completion of the test.

Encourage each child throughout testing; judiciously reinforce effort, not success. Even when testing a very bright child, do not assume any special attitude or favoritism.

Young children may be more difficult to test due to restlessness, excessive curiosity, or shorter attention spans. Try to keep the blocks for the Block Design task out of view to avoid any distraction. Allow the child to take a quick break or to stretch if they tire or get extremely restless.

1.5.2 Hand Recording

Responses are being recorded by hand into test booklets. On the cover of the Record Form, be sure to enter the pertinent information in order that the child's exact age at time of testing can be determined.

Always mark each item clearly to indicate that it has been administered. When recording responses, use the general standard abbreviations shown below:

- (X) - Probe as whenever a question is asked to clarify a response or an item is presented twice.
- DK - Don't know responses or nodding the head "no".
- NR - When the child makes no response either verbally or by gesture to an item.
- R - When the child refuses to answer an item.
- INC - When the child does not complete an item within the specified time limit.

1.5.3 Comments

The Notes section on the cover of the Record Form for the WISC-R can be used to make comments or to record any observations of behavioral or situational variables which may have influenced the child's test performance. Lack of cooperation or problems in hearing or seeing test materials or the presence of excessive noise during testing should be noted. A broken bone which prevents the use of both hands or the writing hand should be noted as should be exclusive use of one hand on Block Design for no apparent reason. Also behavioral patterns such as over activity or hostility should be noted as well. Any other comments that reflect on the interviewer's perception of the reliability of the test administration are important to record.

1.6 Spanish Administration

If the child's primary language is Spanish the WISC-R or WRAT-R should be administered in Spanish. Use the Spanish version of the instructions and use Spanish to converse with and motivate the respondent. The numbers in the Digit Span should be pronounced in Spanish.

If the child is of Hispanic decent but his/her primary language is English, use the English version during testing. Spanish can only be used before formal testing begins to establish rapport and to put the child at ease.

1.7 Recording Incomplete and Partial Complete

If time is running short for the cut-off of a MEC exam session the interviewer should administer as much of the protocol as possible, a partial complete is much better than no data. The reason for the partial complete should be documented in the comments section.

When an SP comes to MEC for an exam but cognitive testing is not administered this should be documented on the bottom of the transmittal form and in the log. The I.D. number should be provided along with the reason testing was not done (e.g., insufficient time to test).

1.8 Record of Transmittal to NCHS

Use the transmittal form (Exhibit 1-3) to list the SP identification number for those who completed cognitive testing. When testing was not done list the SP identification number in the blank space on the bottom of the transmittal record along with the reason testing was not done.

Exhibit 1-3

PH5-6184
Rev. 12/87

**DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
Centers for Disease Control
National Center for Health Statistics**

**NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY III
RECORD OF TRANSMITTAL**

TO:	DATE	STAND NUMBER
	TOTAL NUMBER OF RECORDS	
	TOTAL NUMBER OF BOXES	
	COMPLETED BY	

Here are the _____ (Type of Record) _____ (Deck Number) For _____ (Stand Location)

Examinations were conducted from _____ (Date) through _____ (Date)

Sample numbers of records included are circled below:

001	041	081	121	161	201	241	281	321	361	401	441	481	521	561	601	641	681	721	761	801	841	881	921	961
002	042	082	122	162	202	242	282	322	362	402	442	482	522	562	602	642	682	722	762	802	842	882	922	962
003	043	083	123	163	203	243	283	323	363	403	443	483	523	563	603	643	683	723	763	803	843	883	923	963
004	044	084	124	164	204	244	284	324	364	404	444	484	524	564	604	644	684	724	764	804	844	884	924	964
005	045	085	125	165	205	245	285	325	365	405	445	485	525	565	605	645	685	725	765	805	845	885	925	965
006	046	086	126	166	206	246	286	326	366	406	446	486	526	566	606	646	686	726	766	806	846	886	926	966
007	047	087	127	167	207	247	287	327	367	407	447	487	527	567	607	647	687	727	767	807	847	887	927	967
008	048	088	128	168	208	248	288	328	368	408	448	488	528	568	608	648	688	728	768	808	848	888	928	968
009	049	089	129	169	209	249	289	329	369	409	449	489	529	569	609	649	689	729	769	809	849	889	929	969
010	050	090	130	170	210	250	290	330	370	410	450	490	530	570	610	650	690	730	770	810	850	890	930	970
011	051	091	131	171	211	251	291	331	371	411	451	491	531	571	611	651	691	731	771	811	851	891	931	971
012	052	092	132	172	212	252	292	332	372	412	452	492	532	572	612	652	692	732	772	812	852	892	932	972
013	053	093	133	173	213	253	293	333	373	413	453	493	533	573	613	653	693	733	773	813	853	893	933	973
014	054	094	134	174	214	254	294	334	374	414	454	494	534	574	614	654	694	734	774	814	854	894	934	974
015	055	095	135	175	215	255	295	335	375	415	455	495	535	575	615	655	695	735	775	815	855	895	935	975
016	056	096	136	176	216	256	296	336	376	416	456	496	536	576	616	656	696	736	776	816	856	896	936	976
017	057	097	137	177	217	257	297	337	377	417	457	497	537	577	617	657	697	737	777	817	857	897	937	977
018	058	098	138	178	218	258	298	338	378	418	458	498	538	578	618	658	698	738	778	818	858	898	938	978
019	059	099	139	179	219	259	299	339	379	419	459	499	539	579	619	659	699	739	779	819	859	899	939	979
020	060	100	140	180	220	260	300	340	380	420	460	500	540	580	620	660	700	740	780	820	860	900	940	980
021	061	101	141	181	221	261	301	341	381	421	461	501	541	581	621	661	701	741	781	821	861	901	941	981
022	062	102	142	182	222	262	302	342	382	422	462	502	542	582	622	662	702	742	782	822	862	902	942	982
023	063	103	143	183	223	263	303	343	383	423	463	503	543	583	623	663	703	743	783	823	863	903	943	983
024	064	104	144	184	224	264	304	344	384	424	464	504	544	584	624	664	704	744	784	824	864	904	944	984
025	065	105	145	185	225	265	305	345	385	425	465	505	545	585	625	665	705	745	785	825	865	905	945	985
026	066	106	146	186	226	266	306	346	386	426	466	506	546	586	626	666	706	746	786	826	866	906	946	986
027	067	107	147	187	227	267	307	347	387	427	467	507	547	587	627	667	707	747	787	827	867	907	947	987
028	068	108	148	188	228	268	308	348	388	428	468	508	548	588	628	668	708	748	788	828	868	908	948	988
029	069	109	149	189	229	269	309	349	389	429	469	509	549	589	629	669	709	749	789	829	869	909	949	989
030	070	110	150	190	230	270	310	350	390	430	470	510	550	590	630	670	710	750	790	830	870	910	950	990
031	071	111	151	191	231	271	311	351	391	431	471	511	551	591	631	671	711	751	791	831	871	911	951	991
032	072	112	152	192	232	272	312	352	392	432	472	512	552	592	632	672	712	752	792	832	872	912	952	992
033	073	113	153	193	233	273	313	353	393	433	473	513	553	593	633	673	713	753	793	833	873	913	953	993
034	074	114	154	194	234	274	314	354	394	434	474	514	554	594	634	674	714	754	794	834	874	914	954	994
035	075	115	155	195	235	275	315	355	395	435	475	515	555	595	635	675	715	755	795	835	875	915	955	995
036	076	116	156	196	236	276	316	356	396	436	476	516	556	596	636	676	716	756	796	836	876	916	956	996
037	077	117	157	197	237	277	317	357	397	437	477	517	557	597	637	677	717	757	797	837	877	917	957	997
038	078	118	158	198	238	278	318	358	398	438	478	518	558	598	638	678	718	758	798	838	878	918	958	998
039	079	119	159	199	239	279	319	359	399	439	479	519	559	599	639	679	719	759	799	839	879	919	959	999
040	080	120	160	200	240	280	320	360	400	440	480	520	560	600	640	680	720	760	800	840	880	920	960	

Sample numbers of records not included and reasons why are listed below:

2. AUTOMATED COGNITIVE TESTING - CHILDREN

2.1 Introduction

An automated version of the Cognitive Tests for Children enables the MEC interviewer to enter responses directly into the computer while administering the four cognitive tasks. The program for administering the Children's Cognitive Component provides a more efficient method of entering data and scoring test performance. The MEC interviewer continues to play an important role in administering each of the four tests in much the same manner as done during manual administration of the tests. The test material is still presented manually, as in the WISC-R Block Design and the WRAT-R Reading subtests, but the recording and scoring is entered directly by the interviewer into the computer. The test material for the WISC-R Digit Span is presented aloud by the interviewer in the same manner as done in the manual administration; however, the digit lists do appear on the screen to expedite the presentation and scoring. Finally, the WRAT-R Arithmetic subtest is still administered to the SP on a paper form to provide work space for problem-solving and to enable each SP to work at an individual pace. The Arithmetic items can be scored on the computer by comparing the SP's written answers with the correct answers programmed onto the computer. This automation, therefore, expedites the scoring of this subtest while not affecting the manner in which it is manually administered.

The test protocols for the different age groups of children, 6-16 years, remain the same for the automated version of the Cognitive Testing. Therefore, familiarity with the test protocols presented in the previous chapter is essential in order to properly use the automated version. The sequence in which the four cognitive tasks are administered remains exactly the same, that is, the WISC-R Block Design and Digit Span, followed by the WRAT-R Reading and Arithmetic subtests. The variations in protocol which are designated for different age groups and different performance patterns within age groups are programmed into the automated version, thereby reducing the possibility of incorrectly administering test items which are to be omitted or skipped. Although this feature reduces some of the demands on the MEC interviewer, it is still imperative for the interviewer to follow closely and to recognize any departures from the required testing protocol. Whenever any discrepancy is identified, it is important for the interviewer to note the specific problem in the comments section at the end of the testing session.

The MEC interviewer continues to have the major responsibility for establishing good rapport with each child or adolescent being tested to ensure maximal effort on these tasks. More importantly, the

interviewer must be able to balance the use of the test materials and manual with the use of the computer to enter and score test responses. The need to type in data entries and follow the protocol as presented to the interviewer on the computer screen must not interfere with the use of excellent communication skills in relating to each child or adolescent. Remember you are interacting with the individual, not the computer.

2.1.1 Standardized Testing Procedures

As emphasized in the chapter on the manual administration of the Cognitive Tests for Children, the proper use of these tests requires a thorough familiarity with the specific procedures for administering each task, as well as an appreciation for general standardized testing procedures. The objective is to achieve test results which are comparable for children within certain age groups and across interviewers. Hence, the interviewer should use the same verbatim introduction to the tasks for each respondent. Moreover, the respondent must receive the same orientation to the four subtests and the exact instructional sets given in the manual. The interviewer can ensure this consistency by strictly adhering to test protocols and by reading instructions word-for-word to each individual. Moreover, the interviewer can enhance test reliability and validity by being consistent in the use of motivational cues to ensure maximal effort in test performance. Guidelines for using positive reinforcement remain the same for the automated version as those designated for the manual test administration. Finally, the interviewer is still responsible for timing certain subtests. The automated version has a built-in timer which the interviewer starts and stops by pressing the space bar on the computer keyboard. Hence, while there is no longer any need to handle a stopwatch, timing rules remain critically important for proper administration of these tasks.

To begin the use of the automated version, the MEC interviewer simply selects the "Cognitive Testing" option from the menu that appears on the computer screen. The program begins with an information screen which requires the interviewer to enter the SP identification number (7-digit), the name of the SP, and the SP's date of birth. After each entry press the "Enter" key. If the child does not know what year s/he was born, ask what month and day, then ask how old s/he is now. If the birthday is within a month or two of the testing date, be sure to double check the age by probing. Sometimes children refer to their age at the next birthday if it is approaching soon. Simply ask, "So you will be ___years old on (day and month of birthday)?"

After entering this information, the computer prompts the interviewer with two statements: "So (name) is (age)?" and "Is all the information correct" to which the interviewer must respond with either "Y" for "yes" or "N" for "no", "Z" to exit the entire program or "S" for entering a different sample number. If "N" is entered, the interviewer is asked to enter the correct age of the SP. If "S" is entered the interviewer is asked to enter the correct sample number and to reenter the correct name and date of birth. Then, the screen presents an option as follows: "Do you wish to go directly to the math answers (Y/N)?" to which the interviewer responds "N" in order to start the first test.

The delete feature allows the interviewer to delete a test file. This option should be used rarely and always with caution. The delete function allows an interviewer to delete, from the screen of the computer, the test file of any given respondent. However, this deleted data file is backed up in the computer onto another storage file. When the stored data files are reviewed by NCHS the files you deleted will be marked with an asterisk. You will most likely be using this feature when you incorrectly recorded the sample number although other uses may occur. Please document any unusual situation related to your deletion of a file by explaining what happened on a separate sheet of paper and attaching the note to the WRAT form for transmittal.

2.2 Automated Administration of the WISC-R Subtests

2.2.1 Overview of the WISC-R

The automated administration of the WISC-R subtests still requires the manual presentation of the test materials for Block Design and the oral presentation of the digit lists for Digit Span. The instructional sets must be read aloud word-for-word directly from the test manual as done in the manual test administration. However, the method of recording and scoring responses is modified by the use of the automated version. The procedure for using the automated version of these two subtests is described below.

2.2.2 Block Design

The interviewer must follow the precise protocol instructions given in the previous chapter.

During automated administration the interviewer should use the WISC-R manual to administer the instructions and to check on the protocol criteria. The test materials remain the same, requiring the use of 9 blocks or cubes colored red on two sides, white on two sides, and red/white on two sides. The stopwatch is not necessary for the automated administration because the program has a built-in timing sequence. However, the timing rules remain the same and the interviewer can only activate or stop the internal timer by pressing the space bar on the computer keyboard.

The procedure for administering Block Design remains the same as described in the previous chapter. However, the program selects the starting point based on the SP's age and prompts the interviewer where to begin testing. For example, any SP younger than 8 begins with Design 1, whereas, children 8 and older begin with Design 3. If a child of age 8-16 fails the first trial of Design 3, s/he is given a second trial. Then, regardless of the outcome on that trial, Designs 1 and 2 are administered before proceeding with Design 4 until two consecutive items are missed. However, if a child of age 8 or over passes on the first trial of Design 3, the program automatically calls for the administration of Designs 4-11 until two consecutive failures are made and full credit is given for Designs 1 and 2 without administering either one. Thus, the protocol is the same as that specified for manual administration, but the program automatically takes the interviewer to the proper item as the test progresses.

The automation of sequence makes it even more critical that the interviewer accurately enters the correct code for pass or fail. If the codes are entered incorrectly, then the program may not present the proper sequence of items for that subject. The program bases all its sequencing on the input fed to it by the interviewer; hence, accuracy in recording is essential.

The screens which appear during the administration of Block Design are presented in Appendix B. Note that the top line refers to the subtest and item number. For example, B11 refers to Block Design 1, Trial 1, and B12 refers to Block Design 1, Trial 2, while B21 refers to Block Design 2, Trial 1, and so on. The item is specified in the line under this code to help the interviewer check for his/her place. The interviewer must present the design which is specified on the screen, using the blocks and the model or card, as designated for that item in the manual. Upon scrambling the blocks and reading the instructions, the interviewer presents the card or model and starts the timer by pressing the space bar on the keyboard. Timing must begin just as the directions are finished being read and the card or model is presented. No timing will occur without the interviewer pressing the space bar, so if this step is omitted,

then the item is not administered in a valid way.

When the individual has completed the design and indicates s/he is finished, the interviewer must press the space bar again to stop the timer. Note that the timing appears on the screen as the item is administered. Once the item is completed and the timer is stopped, the interviewer is given 5 options for recording. These options are shown on the print-outs of the screens below. If the individual correctly completes the design within the designated time span, the interviewer enters "1" for "Pass". If the individual does not complete the design in the time limit, or makes the design incorrectly, the interviewer enters "2" to indicate a "Fail" or failure.

The other three options are as follows:

- "R" Restart timer-This feature allows the interviewer to start timing the SP if for some reason the space bar is pressed too soon or too late. It should be used sparingly because any re-trials on items constitute practice, and therefore influence performance.
- "C" Continue timer-This feature allows the interviewer to start the timer back up if it is accidentally stopped prematurely or before the SP is finished. Again, it is important not to use this feature except when absolutely necessary in order to avoid invalidation of test results. The interviewer should encourage each SP to indicate when s/he has finished in order to reduce the possibility of stopping the timer too soon.
- "-" Backup-This feature is built into the program for use in the rare case when it is necessary to go back to a previous item or test. No test item should be given more than once; however, this feature permits the interviewer to back-up and check a data entry or to correct the entry in last screen if an error in recording is made. When this feature is activated in the block design, the score "1" for pass or "2" for fail entered previously will appear to the left of the cursor box so that the interviewer can check or correct the entry.

The program does not always allow the interviewer to back up the screen. For example this feature allows you to backup just one screen in the Block Design subtest while in the Digit Span this feature can be activated to back up any number of screens in the subtest.

When the SP fails two consecutive designs, the program automatically skips to the next subtest of the WISC-R.

2.2.3 Digit Span

The automated version of the Digit Span follows the same procedures given for the manual administration. The test material does appear on the screens, as shown on the print-outs below. However, the interviewer must still read word-for-word the exact instructions for both Digits Forward and Digits Backward as given in the manual.

The first screen to appear is Item 1 for Digits Forward since all SPs have the same starting point for this subtest. The interviewer reads the instructions, then reads the first set of numbers presented under "Trial 1" at a rate of one digit per second. Then, the interviewer must listen carefully to the SP's response and make a note of whether the trial is passed or failed. Then, the interviewer reads the digits listed under the column "Trial 2" at a rate of one digit per second and waits for the SP to respond. Then, the interviewer scores both trials by entering the appropriate code as follows:

- "0" Fail both-The SP responds incorrectly to both trials presented for that item.
- "1" Pass one-The SP responds correctly to either Trial 1 digits or Trial 2 digits, but not both.
- "2" Pass both-The SP responds correctly to both trials of digits for that item.
- "-" Backup-The interviewer needs to return to the previous screen due to some error in presentation or recording.

Once again, the backup feature is not to be misused or over used. Trials should never be presented twice unless there is an interruption in the first presentation which prevents the SP from hearing or responding. Otherwise, any second presentation of the same digits constitutes practice and invalidates the trial. If the SP was not attentive, simply present the next trial and continue the test administration. As in the block design, when the backup mode is activated the previous screen is shown with the score entered appearing to the left of the cursor for verification.

When the SP misses both trials of any item, Digits Forward ends, and the computer skips to Digits Backward. This part is administered in the same way with the use of the same four recording options: "0"-Fail both; "1"-Pass one; "2"-Pass both; and "-" for Backup. Note that if it is necessary to back up from Digits Backward to Digits Forward due to an interviewer error in recording, the interviewer must hit the "-" key repeatedly until the last item presented appears on the screen.

One other variation in the data entry on this subtest is that the interviewer does not have to hit the return key after entering the scoring code. The program records the code and then automatically presents the next appropriate item in sequence. Remember that all children, regardless of age or performance, are given Digits Forward followed by Digits Backward until both trials of any item on each part is missed.

2.3 Automated Version of the WRAT-R

2.3.1 Overview of the WRAT-R

The automated version of the WRAT-R subtests require the use of the test materials used for the manual administration. The program automates the sequence of presenting written and oral parts of both subtests in accordance to task performance. The program is designed to follow the test protocol. Print-outs of the screens as they appear in the automated version are given in Appendix B.

2.3.2 WRAT-R Reading

The Reading subtest of the WRAT-R has two levels which are designated for the age groups of under 12 years old and 12 to 16 years old, respectively. The former is called Level 1. As in the manual administration described in the previous chapter, children of ages 6 to 7 years, 11 months, begin the Level 1 Reading subtest at the Pre-reading section. Three pre-reading tasks are involved. The child must name 13 letters of the alphabet, match 10 letters of the alphabet, and name 2 letters in his/her name, in that order. If the child is able to name all 13 letters correctly in part 1 of the Pre-reading section, then parts 2 and 3 are skipped, and credit is given for those items for a total of 25 points. Then, the child of this age group proceeds to the Formal Reading section, Line 1 and continues reading aloud until 10 consecutive errors are made.

Children of ages 8 to 11 years, 11 months, begin the WRAT-R Reading subtest with the Formal Reading section, Line 1, and continue reading until the first mispronunciation occurs. At this point, the interviewer asks the child to pronounce the word again. If the second pronunciation is not correct, then the Pre-reading section will automatically come up on the screen in response to the second "2" code for the first word missed. Then the Pre-reading section is administered in the same way as that used in testing the younger children. However, if the second pronunciation is correct, the child continues reading line by line until 10 consecutive errors are made. After ten words in a row are failed, the test is discontinued. Note that if another error occurs on the first line the prereading section is administered. When there is no need to administer the Pre-reading section; credit of 25 points is added to the score on the Formal Reading.

The automated version requires the interviewer to enter a scoring code after each response is made on the Pre-reading section or after each word is read on the Formal Reading section. When the child makes his/her first error in the Formal Reading section, the computer will automatically prompt the interviewer to allow a second try by flashing the "2" code for "Fail" above the word missed. The interviewer must enter a code to score the second try before going onto the next word. This is mandatory or else the scoring of the responses and the actual data entry will get out of synchrony if the second code is not entered.

The screens are presented in Appendix B for Level 1. Notice that the coding options are as follows:

- "1" Pass-The word is correctly pronounced.
- "2" Fail-The word is incorrectly pronounced.
- "-" Backup-The scoring code for a previous word must be corrected by the interviewer. Note that this option should only be used when a code is entered incorrectly, or in the event that the SP spontaneously corrects a mispronunciation, or the SP spontaneously changes a correctly pronounced word to an incorrect pronunciation of the same word. This feature parallels the manual scoring method. Activation of the backup feature causes the score previously entered to appear above the cursor box for verification.

"+" Continue-This permits the interviewer to move the cursor onto the next word or section of the test in the event of an interruption or if the interviewer backed up over previously scored words to make a correction. Note that the words already read and scored are not read and scored again. A second pronunciation is only allowed after the first error or if the interviewer cannot score a response given.

Note that the time limit of ten seconds per word or letter must still be monitored by the interviewer. If the SP does not respond after 10 seconds, score "2" for failed and prompt the SP to go on by saying, "Next, please."

Level 2 of the WRAT-R Reading subtest is programmed according to protocol as well. All children of ages 12 years and older begin the subtest at the Formal Reading section. When the first error occurs, the SP is asked to pronounce the word again. Then, whether or not the SP correctly pronounces the word on the second try, the Formal part continues until 10 consecutive errors are made. At that point, if the SP has not achieved a score of 11 points or more correct on the Formal Reading section, then the Pre-reading section is administered. Both parts of this section are given to the SP who fails to reach the criterion score of 11 or more points on the Formal Reading section. The Pre-reading section consists of naming 2 letters in the SP's name and in naming 13 letters of the alphabet. If all answers are correct, or if the Pre-reading section is not required, then 15 points are credited.

Note that the format of the automated version of Reading Level 2 is the same as that for Level 1 in that the interviewer has the same scoring options described above: "1" for "Pass"; "2" for "Fail"; "-" for Backup; and "+" for Continue. Scoring is done in the exact same manner and parallels that used for the manual administration.

Be sure to give the SP the reading card to use during testing. Check to make sure the SP is given the reading card which is appropriate for the level of testing. If a child reads too quickly for the interviewer to keep up with data entry, the interviewer must ask the child to slow down some. This can be said gently in a way that does not deter the child from giving his/her best effort on the test.

2.3.3 WRAT-R Arithmetic

The automation of the WRAT-R Arithmetic subtest provides only for scoring and data entry. The administration of the subtest itself requires the use of the paper form in order for children to work at their own pace and to show their work. Level 1 Arithmetic for children ages 6 to 7 years, 11 months begins with the reading of the first problem aloud. If the child cannot read problem 1, then the Oral part is administered. The procedure for administering these seven items is identical to that described in the manual. All seven items in the Oral part are administered regardless of performance. For younger children who are able to read the first three items on the Written part, timing begins on problem 4. The interviewer must press the space bar to start the timed 10-minute test. If a child fails to obtain a score of 5 points on the Written part, then the Oral part is administered at the end of the 10-minute period. If a young child completes all of the work that s/he is able to do in less than 10 minutes, the interviewer can end the test early by using the hitting the "X" key to abort the program. The interviewer should only use this option if the child is obviously uncomfortable using the entire 10 minutes or indicates that s/he is finished working.

For children of ages 8 to 11 years, 11 months, Level 1 is administered with the introduction given in the manual for that age group. Note that timing begins at problem 1 when the interviewer finishes reading the directions. Any child in this age group who attains a total score of 4 or less on the written part is then given the Oral part subsequent to the Written part.

Note that the screens for Level 1 show the problems as they appear on the record form for the Written part. The interviewer only starts the timer at the designated point by pressing the space bar. When the 10-minute period is over, the computer will beep and send a message indicating that the test is over. Then, if it is necessary to administer the Oral part because of failure to reach a criterion score of 5 points, the interviewer selects that option "1" for "Oral" and then administers the problems, word-for-word, as stated in the manual. After each response given, the interviewer scores the oral problems, using "1" for "Pass"; "2" for "Fail. The progress of the data entry can be controlled by using the "-" for Backup, "+" for Continue as in previous subtests and "Z" for leaving the arithmetic section. Note that the correct response to problem 1 on the Level 1 test, when read out loud by the younger children, is "2". However, the interviewer must enter "1" to indicate "Pass" instead of typing in the response itself.

Level 2 is administered to children 12 years and older with all children of that age group beginning with the Written part. The interviewer must read the instructions verbatim from the manual and then press the space bar to begin timing the 10-minute time limit. At the end of that time, if the SP has not reached a criterion score of 6 or more correct, then the interviewer must select the option for the Oral part and administer those items according to the procedures given in the manual. Note that counting to 5 dots is scored as one point and counting all 15 dots correctly is scored as an additional point. If an SP does not count 5 dots correctly, no points can be awarded for the second part of this problem. Each number must be correctly identified and scored separately as "1" for "Pass" or "2" for "Fail". Finally, each of the word problems must be read verbatim by the interviewer and scored separately as "1" for "Pass" or "2" for "Fail". If the criterion score is reached by the child of 12 years or older on the Written part, the Oral part is never administered and full credit is given during scoring.

At the end of the test session, the interviewer should thank the SP and walk him/her back to the coordinator. When the interviewer is not able to correct the arithmetic subtests, using the automated system, immediately after the testing has ended, he/she should use the "Z" feature to skip to the exit screens. He/she should enter his/her technician number and comments and then exit the respondent file. To score the arithmetic test later, enter the respondents I.D. number to access the file then take the option for "Math answer." which skips directly to arithmetic scoring.

2.3.4 Closing Screens

Several screens appear at the end of the test file. They contain a series of questions to answer including whether or not Spanish administration occurred, the quality of the test, the test completion status, and other comments relevant to the respondent or the testing situation. Finally, you are given an option to continue testing or to leave the program.

2.4 Special Considerations

The automated version of the Cognitive Testing for Children provides an efficient way of scoring and data entry of this component of the NHANES III MEC Exam. The program is interactive to the extent that it prompts the interviewer when and how to respond throughout test administration. If also

relieves the interviewer of the task of handling a stopwatch while administering the four cognitive tasks. The automated system thereby reduces variation across test sessions and among interviewers in timing. However, the system still requires the start and stop commands to implement the internal timer. The interviewer, therefore, maintains the responsibility to stay alert and attentive throughout test administration.

The automated version reduces paper work and tedious editing routines required of paper versions. However, direct data entry makes it imperative that interviewers pay close attention to the keying of responses to ensure accuracy in recording the score for each response given. The interviewer should not go back and edit the data or make changes based on recall after a session is over. The only reason for calling up a particular case after testing is to score Math answers. Any attempts to alter data based on recall are likely to invalidate the test results.

A critical issue that should be emphasized relates to the block design scoring by the automated system. It is possible for the interviewer to change the recorded time it took to respondent to complete each block design if the file is reentered after testing is completed. Therefore, if the interviewer has to reenter a file to correct a subsequent subtest, the Block Design screens should be bypassed by using the "Z" option. Use the "Z" option to move through these screens will not change the time or corrections score recorded during testing. Under no circumstances should the interviewer move through these screens, when reentering a file with data on it, by pressing the space bar and reentering the score obtained for the design. These actions will change the test results recorded during testing by the automated system.

Finally, it is important for the interviewer to keep in mind that the cognitive tests are being administered individually in an interview context. Basic communication skills and good attending behavior are essential to ensure the quality of the data. Any observations made by the interviewer during testing are important to the interpretation of the results. At the point of closing the interview, the interviewer should use the exit screens to enter any pertinent observations or comments which may have influenced the reliability or validity of the testing session. The highly skilled interviewer relies on the computer only as a tool to facilitate test administration and scoring without allowing the machine to interfere with the one-to-one nature of individual test administration. The use of appropriate motivational comments to encourage maximal effort and the use of eye contact and good verbal following skills are essential to ensure the best results.

2.5 Other Considerations

2.5.1 Spanish Administration

When you administer the WISC-R and the WRAT-R in Spanish use the Spanish version of the instructions and use Spanish to converse with and motivate the respondent. Since your bilingual skills will be taxed in this circumstance take care not to make entry errors when using the English automated system. The numbers in Digit Span should be read in Spanish. This will simulate across language administration the degree of familiarity children have with digits they need to recall for the task.

2.5.2 Using Manual Administration

The automated program has been built with many features that allow you to correct recording errors. It is possible, however, to be forced to switch to manual administration during testing. For example, the system could go down because of a power failure. If a switch midtesting from automated to manual administration becomes necessary document the situation in your comments.

2.5.3 Storage and Backup Procedures

Recorded scores entered by the interviewer through the automated program are automatically stored by the computer into a data file. The MEC coordinator is responsible for backing up the files on a weekly basis.

APPENDIX A

SUMMARY OF PROTOCOL FOR ADMINISTRATION OF THE WRAT-R

**SUMMARY OF PROTOCOL FOR ADMINISTRATION
OF THE WRAT-R**

1. Reading

Level 1 - for children Age 6-7 years 11 mo. (Younger than 8)

- Begin at the prereading section

Part 1 - Naming 13 letters if child names all letters correctly, s/he receives full credit for prereading part 2 (recognizing 10 letters) and part 3 (two letters in names) without administration.

Part 1 - Naming 13 letters if child makes an error on 13 letters proceed with prereading parts 2 & 3.

- Administer formal reading section next

When the first error occurs ask the child to say the word again - score second answer. Continue until 10 consecutive errors or in a very young child discontinue if child states s/he can't read word or didn't get up to this in class. Discontinue only after asking child to try that word and the next word.

2. Reading

Level 1 - for children Age 8 - 11 years 22 mo.

Begin at the formal reading section

If failure occurs on the first line of the formal reading - ask child to read word again. If s/he does not self-correct or makes another error on the 1st line stop the formal reading and administer the oral reading immediately.

- Follow rules for administering level I prereading section summarized for ages 6-7 years 11 mo.
- After administering the prereading return to formal reading section. Continue at word you left off with until 10 consecutive errors are made.
- If child correctly reads the 1st line of the formal reading section continue until 10 consecutive errors. This child receives credit for the prereading section without administration.

3. Reading

Level 2 - for children Ages 12 and over

- Begin at the Formal Reading Section

When the reading error is made ask the child to say the word again. Score second answer then continue the formal reading section until 10 consecutive errors are made.

- Check the total score to determine if prereading should be administered.

If the child scores 10 points or less (Does not receive a total score of 11) administer the prereading as follows:

1. Ask him/her to name 2 letters in his/her name.
2. Name 13 capital letters printed above the word list.

If the child's total score is 11 points or more s/he receives credit for the prereading without administration.

4. **Arithmetic**

Level 1 for children 6-7 years 11 mo.

- Start with written part - use directions "Read this ... Start timing after the 3rd written problem- allow 10 minutes.
- When to Administer Oral Part
 1. Child can't read 1st written problem.
 2. Child scores less than 5 points on written part (Total score of 4 or less)
- When to give credit for Oral Part Without Administration

Child scores 5 or more correctly on written part

5. **Arithmetic**

Level 1 - for children 8 - 11 yrs.

- Start with Written Part

Use directions "This is an arithmetic test..."
Begin timing at 1st problem
- When to Administer Oral Part

Child receives total score of less than 5 points on written part (total score 4 or less).
- When to Give Credit for Oral Part Without Administration

Child scores 5 or more correctly on written part.

6. Arithmetic

Level 2 - for children age 12 and up

■ Start with Written Part

Start timing after giving instructions and giving pencil to child - Allow 10 minutes.

■ When to Administer Oral Part

Child scores 5 points or less on the written part.

■ When to Give Credit for Oral Part Without Administration

Child scores 6 or more correctly on the written part.

APPENDIX B

AUTOMATED COGNITIVE TESTING SCREENS

Cognitive Testing for Children
Version 1.0
Programmed by Ronald Biggar

Enter following data for Sample Person:

ID: 0000000

Name: ronald biggar

Date of Birth: 12/12/74

```
#####  
#  
# Do you wish to go directly to math answers? #  
# 1 = Yes 2 = No #  
# 2 #  
#  
#####
```

```

Efffff.
@B11. @
Efffff.
Efffff.
@ Design 1, first trial (45 seconds) @
@ press SPACE BAR to start or stop @
@
Efffff.

Efffff.
@ 2 = elapsed time @
Efffff.
Efffff.
@ 1 = Pass 2 = Fail R = Restart C = Continue @
@ - = Backup timer timer @
@
@
Efffff.

```



```
#####
#B22. #
#####
#####
# Design 2, second trial (45 seconds) #
# press SPACE BAR to start or stop #
#
#####

#####
# 2 = elapsed time #
#####
#####
# 1 = Pass 2 = Fail R = Restart C = Continue #
# - = Backup timer timer #
#
#
#####
```

```
Eiiii.  
QB31. 2  
Eiiii  
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii.  
2 Design 3, first trial (45 seconds) 2  
2 press SPACE BAR to start or stop 2  
2  
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
```

```

#####
#B31. #
#####
#####
# Design 3, first trial (45 seconds) #
# press SPACE BAR to start or stop #
# #
#####

#####
# S = elapsed time #
#####
#####
# 1 = Pass 2 = Fail R = Restart C = Continue #
# - = Backup timer timer #
# #
#####

```

```

Eiiii>
@B32.
Eiiii
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii>
@ Design 3, second trial (45 seconds) @
@ press SPACE BAR to start or stop @
@ @
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii>

Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii>
@ 2 = elapsed time @
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii>
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii>
@ 1 = Pass 2 = Fail R = Restart C = Continue @
@ - = Backup timer timer @
@ @
@ @
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii>

```

```

#####
#B40.#
#####
#####
# Design 4 (45 seconds) #
# press SPACE BAR to start or stop #
# #
#####

#####
# 3 = elapsed time #
#####
#####
# 1 = Pass 2 = Fail R = Restart C = Continue #
# - = Backup timer timer #
# 1 #
# #
#####

```

```

Efffff.
2250. 2
Efffff.
Efffff.
2 Design 5 (75 seconds) 2
2 press SPACE BAR to start or stop 2
2 2
Efffff.

Efffff.
2 2 = elapsed time 2
Efffff.
Efffff.
2 1 = Pass 2 = Fail R = Restart C = Continue 2
2 - = Backup timer timer 2
2 1 2
2 2
Efffff.

```

```

Eiiii>
2B60. 2
Eiiii4
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii>
2 Design 6 (75 seconds) 2
2 press SPACE BAR to start or stop 2
2 2
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii4

Eiiiiiiiiiiiiiiiiiiiiiiii>
2 2 = elapsed time 2
Eiiiiiiiiiiiiiiiiiiiiiiii4
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii>
2 1 = Pass 2 = Fail R = Restart C = Continue 2
2 - = Backup timer timer 2
2 1 2
2 2
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii4

```

```

Efffff>
@B70. @
Efffff<
Efffffffffffffffffffffffffffffffffffffffff>
@ Design 7 (75 seconds) @
@ press SPACE BAR to start or stop @
@ @
Efffffffffffffffffffffffffffffffffffffffff<

Effffffffffffffffffffffffffffffff>
@ 8 = elapsed time @
Effffffffffffffffffffffffffffffff<
Efffffffffffffffffffffffffffffffffffffffff>
@ 1 = Pass 2 = Fail R = Restart C = Continue @
@ - = Backup timer timer @
@ 2 @
@ @
Efffffffffffffffffffffffffffffffffffffffff<

```


Eii.
2 Digits Forward, Test 2 2
Eii4

Trial 1
3-4-1-7

Trial 2
6-1-5-8

Eii.
2 0 = Fail both, 1 = Pass one 2
2 2 = Pass Both - = Backup 2
2 2
2 2
2 2
Eii4

#####.
@ Digits Forward, Test 5 @
#####

Trial 1

5-1-7-4-2-3-8

Trial 2

9-8-5-2-1-6-3

#####.
@ 0 = Fail both, 1 = Pass one @
@ 2 = Pass Both - = Backup @
@ @
@ @
@ @
#####

Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii»
2 Digits Backward, Test 7 :2
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii¼

Trial 1

Trial 2

6-9-1-6-3-2-5-8

3-1-7-9-5-4-8-2

Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii»
2 0 = Fail both, 1 = Pass one 2
2 2 = Pass Both - = Backup 2
2 2
2 2
2 2
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii¼

Reading, Level 1 : 1 = Pass 2 = Fail - = Back + = Continue #
#####

A R Z H I Q S E B O
A B O S E R T H P I U Z Q

§ Reading level 1, 1 = Pass 2 = Fail = Back + Continue

CAT	SEE	RED	TO	BIG	WORK	BOOK	EAT	WAS	HIM
HOW	THEN	OPEN	LETTER	JAR	DEEP	EVEN	SPELL	AWAKE	
BLOCK	SIZE	WEATHER	SHOULD	LIP	FINGER	TRAY	FELT	STALK	
CLIFF	LAME	STRUCK	APPROVE	PLOT	HUGE	QUALITY	SOUR		
IMPLY		HUMIDITY	URGE	BULK	EXHAUST	ABUSE	COLLAPSE		
GLUTTON	CLARIFY	RECESSION		THRESHOLD	HORIZON	RESIDENCE			
PARTICIPATE		QUARANTINE		LUXURIOUS	RESCINDED	EMPHASIS			
AERONAUTIC		INTRIGUE		REPUGNANT	PUTATIVE	ENDEAVOR			
HERESY		DISCRETIONARY		PERSEVERE	ANOMALY	RUDIMENTARY			
MISCREANT		USURP	NOVICE	AUDATIOUS	MITOSIS	SEISMOGRAPH			
SPURIOUS		IDIOSYNCRASY		ITINERARY	PSEUDONYM	ABORIGINES			

? Reading, Level 2 : 1 = Pass 2 = Fail - = Back + = Continue ?
#####

A B O S E R T H P I U Z Q

ronald biggar

Name first letter in your name.

#####>
2 Reading, Level 2 : 1 = Pass 2 = Fail - = Back + = Continue 2
#####

A B O S E R T H P I U Z Q
ronald biggar
Name another letter.


```

#####-#####
* The answer is: 2 1 = Pass 2 = Fail - = Back + = Cont:
#####

```

```

          32
1 + 1 =      6      5      24      4 x 2 =      23      29
          +2      -3      +40      x3      -18
4 - 1 =      AA      AA      AAA      6 / 2 =      AA      AAA

          452
75      137      401      $62.04      1 A hr. = AAAAAA min.
+8      +245      -74      -5.30      2
AA      AAAA      AAAAA      AAAAAA      1 A + 1 A -
          3      3      3      3      5
          4 -
          6
          1
          3 -
          3
          1
          + 2 -
          2
          AAAAAAA

```

```

UAAAAAA      15      1
6 ' 968      AA =      - yd. = AAAAAin.
          5      2
          7 5      3
          - - - =      1 - = -
          9 9      4 4

```

Level 1 arithmetic - 1 of 3

#Arithmetic, ORAL Part Level 2, 1 = Pass 2 = Fail - = Back + = Cont. #
#####

1. Counts 1-5
2. Counts 6-15
3. Reads: 3 5 6 17 41
4. Pennies 3 - 1
5. Apples 3 + 4
6. Marbles 9 - 3

```

#####
a      10 MINUTE TIMER          press SPACE BAR to start or stop      a
a
a
#####
2 + 7 =          43          73          36          94          3 x 4 =          512
          + 6          + 9          -15          -64          x 3
8 - 4 =          AAAA          AAA          AAA          AAA          18 / 6 =          AAAAAA

          1          1
          4 - 2 + 3 =          - 2 of 18 =          229
          2          2          2          2          5048
          63
$ 4.95          726
x 3          -349
AAAAAA          AAAAAA          1          1          1          1381
          2 - 2 + 1 - 2 =          6 of 30 =          AAAAAA
          2          2          6

          1          Add: 6 - 1
          1 - ft. =          4
          3          5
          809
          2 - _____ = 1/4          1 - 8
          4          1 - 8
          4 - 2          4 - 2
          2

```

Level 2 arithmetic screen 1 of 4

```

Eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee.
 10 MINUTE TIMER          1 = Oral  2 = Math  R = Restart  C = Cont
Eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee.
 1 = elapsed time          answers      timer      timer
Eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee.
 2 + 7 =          43          73          36          94          3 x 4 =          512
                   + 6          + 9          -15          -64          x 3
 8 - 4 =          AAAA          AAA          AAA          AAA          18 / 6 =          AAAAAA

                                1
                                4 - + 3 =          1
                                2
                                2
                                1
                                2 - + 1 - =          1
                                2          2          6
                                1
                                1 - ft. =          Add: 6
                                3
                                1
                                2 - _____ = 1
                                4
                                4
                                1
                                4 -
                                2

```

```

$ 4.95
 x 3
AAAAAA

```

```

 726
-349
AAAAAA

```

```

229
5048
 63
1381
AAAAAA

```

```

UAAAAAAAAA
5 ' 215

```

```

UAAAAAAAAA
9 ' 4527

```

```

809
x47
AAAA

```

level 2 ans. screen 1 after timing stopped

 # The answer is: 42% # 1 = Pass 2 = Fail - = Back + = Cont. #
 #####

Write as percent:	Subtract:	Multiply:	Find average:	Write as decima
.42 = #####%	$\begin{array}{r} 1 \\ 10 - \\ 4 \\ 2 \\ 7 - \\ 3 \\ \hline \end{array}$	$\begin{array}{r} 6.23 \\ 12.7 \\ \hline \end{array}$	34, 16, 45, 39, 27 ans. #####	$\begin{array}{r} 1 \\ 52 - \% = \\ 2 \end{array}$
#####	$\begin{array}{r} \text{Add: } 3 \text{ ft. } 6 \text{ in.} \\ 5 \text{ ft. } 5 \text{ in.} \\ 8 \text{ ft. } 11 \text{ in.} \\ \hline \end{array}$	$\begin{array}{r} M + 2 = 5 \\ M = \\ 2x = 3 \\ x = \end{array}$	Write as percent	$\begin{array}{r} 3 \\ - \\ 8 \\ 7 \\ 6 \times 3 - \\ 8 \end{array}$
2.9 ' 308.85				
Write as common fraction in lowest terms:		The complement of an angle of 30 degrees:		15% of 175
.075 =		#####		

Level 2 math screen 2 of 4

APPENDIX B

AUTOMATED COGNITIVE TESTING SCREENS (continued)

The answer is: 3, -1 a 1 = Pass 2 = Fail - = Back + = Cont

$$\begin{aligned}
 3p - q &= 19 \\
 2p - q &= 7
 \end{aligned}$$

$$p = \text{AAAAA}$$

$$q = \text{AAAAA}$$

$$\text{Sqr. root of } 2ax = 6$$

$$x = \text{AAAA}$$

$$\frac{7}{17} = \frac{6}{x} \quad x =$$

Find square root:

of 67081

Ans.

$$\log_{10} \frac{1}{100}$$

Ans.

$$\log_5 5/5$$

Ans.

Reduce:

$$\frac{k^2 + k}{2} \quad \frac{3k - 3}{2}$$

Ans.

Find root:

$$2x^2 - 36x = 1$$

Ans.

Level 2 arith screen 4 of 4

Cognitive Testing for Children

Version 1.0

Programmed by Ronald Biggar

Enter following data for Sample Person:

ID: 0000000

Name: ronald biggar

Date of Birth: 12/12/74

```
#####  
?  
? Do you wish to go directly to math answers? ?  
? 1 = Yes 2 = No ?  
? 2 ?  
?  
#####
```

```

Eiiii.
@Bll. @
Eiiii.
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii.
@ Design 1, first trial (45 seconds) @
@ press SPACE BAR to start or stop @
@ @
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii.

Eiiiiiiiiiiiiiiiiiiiiiiiiiiii.
@ 2 = elapsed time @
Eiiiiiiiiiiiiiiiiiiiiiiii.
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii.
@ 1 = Pass 2 = Fail R = Restart C = Continue @
@ - = Backup timer timer @
@ @
@ @
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii.

```

```

Eiiii>
B12. 2
Eiiii4
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii>
2 Design 1, second trial (45 seconds) 2
2 press SPACE BAR to start or stop 2
2 2
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii4

Eiiiiiiiiiiiiiiiiiiiiiiii>
2 2 = elapsed time 2
Eiiiiiiiiiiiiiiiiiiiiiiii4
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii>
2 1 = Pass 2 = Fail R = Restart C = Continue 2
2 - = Backup timer timer 2
2 2
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii4

```

```
Effff.
  B21.
Effff
Eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee.
  Design 2, first trial (45 seconds)
  press SPACE BAR to start or stop
Eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee

Eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee.
  2 = elapsed time
Eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee
Eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee.
  1 = Pass 2 = Fail R = Restart C = Continue
  - = Backup timer timer
Eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee
```

```

Efffff.
aB22. a
Efffff.
Efffffffffffffffffffffffffffffffffffffffff.
a Design 2, second trial (45 seconds) a
a press SPACE BAR to start or stop a
a
Efffffffffffffffffffffffffffffffffffffffff.

Efffffffffffffffffffffffff.
a 2 = elapsed time a
Efffffffffffffffffffffffff.
Efffffffffffffffffffffffffffffffffffffffff.
a 1 = Pass 2 = Fail R = Restart C = Continue a
a - = Backup timer timer a
a
a
Efffffffffffffffffffffffffffffffffffffffff.

```

Eiiii.
aB31. a
Eiiii.
Eii.
a Design 3, first trial (45 seconds) a
a press SPACE BAR to start or stop a
a
Eii.

```

Eiiii.
2B31. 2
Eiiii.
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii.
2 Design 3, first trial (45 seconds) 2
2 press SPACE BAR to start or stop 2
2 2
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii.

Eiiiiiiiiiiiiiiiiiiiiiiii.
2 5 = elapsed time 2
Eiiiiiiiiiiiiiiiiiiiiiiii.
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii.
2 1 = Pass 2 = Fail R = Restart C = Continue 2
2 - = Backup timer timer 2
2 2
2 2
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii.

```

```
Efffff.
2B32. 2
Efffff4
Efffff.
2 Design 3, second trial (45 seconds) 2
2 press SPACE BAR to start or stop 2
2
Efffff4

Efffff.
2 2 = elapsed time 2
Efffff4
Efffff.
2 1 = Pass 2 = Fail R = Restart C = Continue 2
2 - = Backup timer timer 2
2
2
Efffff4
```



```
Eiiii>
@B50. @
Eiiii>
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii.
@ Design 5 (75 seconds) @
@ press SPACE BAR to start or stop @
@ @
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii>

Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii>
@ 2 = elapsed time @
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii>
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii>
@ 1 = Pass 2 = Fail R = Restart C = Continue @
@ - = Backup timer timer @
@ 1 @
@ @
Eiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii>
```

```

Efffff>
@B60. @
Efffff<
Efffffffffffffffffffffffffffffffffffffffff>
@ Design 6 (75 seconds) @
@ press SPACE BAR to start or stop @
@ @
Efffffffffffffffffffffffffffffffffffffffff<

Efffffffffffffffffffffffffff>
@ 2 = elapsed time @
Efffff<
Efffffffffffffffffffffffffffffffffffffffff>
@ 1 = Pass 2 = Fail R = Restart C = Continue @
@ - = Backup timer timer @
@ 1 @
@ @
Efffff<

```

```
Efffff.
2270. 2
Efffff.
Efffff.
2 Design 7 (75 seconds) 2
2 press SPACE BAR to start or stop 2
2 2
Efffff.

Efffff.
2 8 = elapsed time 2
Efffff.
2 1 = Pass 2 = Fail R = Restart C = Continue 2
2 - = Backup timer timer 2
2 2 2
2
Efffff.
```


APPENDIX C

SPANISH TRANSLATION

NIVEL 1:

Lectura:

Mire cada palabra cuidadosamente y léala en voz alta. Empiece aquí y lea las palabras a través de la línea de manera que yo lo pueda oír. Cuando termine la primera línea, vaya a la siguiente línea y luego a la próxima.

Siguiente.

Trate la palabra de todas maneras.

Trate de adivinarla.

Lea estas letras en voz alta.

¿Qué es esto?

¿Cómo le llama a esto?

Encuentre una igual que ésta aquí abajo en esta línea.

¿Cómo llama usted esta letra? ¿Cuál es esta letra? ¿Y esta?

Aritmética:

Lea esto. ¿Cuál es la respuesta? Escríbala en esta línea. Ahora lea esto y ponga la respuesta en esa línea. A continuación lea esto y ponga la respuesta bajo la línea. Luego lea todos los otros problemas en esta hilera y ponga las respuestas sobre o bajo las líneas.

Señale con el dedo y cuente estos patos uno por uno. Empezando aquí y yendo hacia acá. Cuente los patos en voz alta de manera que yo lo pueda oír, y dígame cuantos patos hay ahí.

Ahora señale a cada de estas cajas y cuente en voz alta. Dígame cuantas cajas hay aquí.

Señale con el dedo y cuente estos puntos uno por uno empezando aquí y contándolos en voz alta de modo que yo lo pueda oír, y dígame cuantos puntos hay aquí.

Lea estos números. ¿Cuál es este? ¿Y este?

Muéstreme 3 dedos. Muéstreme 8 dedos.

¿Qué es más, 9 o 6? ¿Qué es más, 42 o 28?

Si usted tiene 3 centavos y gasta 1 de ellos, ¿cuántos le quedan? ¿Cuánto es 3 y 4 manzanas? José tenía 9 bolitas. El perdió tres de ellas. ¿Cuántas le quedaron?

Esta es una prueba de aritmética. Mire los problemas impresos bajo la línea oscura y que siguen en la siguiente página. Quiero saber cuántos de los problemas puede resolver. Mire cada problema cuidadosamente para que vea lo que se supone que usted haga - sumar, restar, multiplicar, o dividir - y luego ponga su respuesta en el espacio sobre o bajo las líneas. Es posible que usted quiera hacer sus cálculos en el papel, puede usar los espacios vacíos o los lados para escribir. También hay espacio al final de la página 3. Primero haga la hilera de arriba, luego la segunda hilera, luego la tercera, etc. Los problemas se hacen más difíciles a medida que va hacia abajo en la página y en la próxima. No gaste mucho tiempo en ningún problema. Puede pasar por alto un problema si es muy difícil para usted, pero haga los más que pueda uno por uno. Tendrá 10 minutos. Ahora, empiece y haga tantos como pueda. No olvide pasar a la segunda página de problemas.

NIVEL 2:

Lectura:

Mire cada palabra cuidadosamente y léala en voz alta. Empiece aquí y lea las palabras a través de la página de modo que yo lo pueda oír. Cuando termine la primera línea, vaya a la siguiente línea, y luego a la próxima, etc.

Aritmética:

Me gustaría saber cuántos de los problemas en estas dos páginas puede resolver. Mire cada problema cuidadosamente para que vea que se supone que debe hacer - sumar, restar, multiplicar, o dividir - y luego ponga su respuesta en el espacio sobre o bajo el problema. Puede que quiera hacer los problemas en el papel, puede usar los espacios vacíos o los márgenes para escribir. Primero haga la hilera de arriba en la primera página, luego la segunda y la tercera hilera etc. Los problemas se hacen más difíciles a medida que va hacia abajo en la página y en la próxima. No gaste mucho tiempo en ninguno de los problemas. Puede pasar por alto un problema si este es muy difícil para usted, pero haga los más que pueda uno por uno. Tendrá 10 minutos. Ahora empiece y haga lo más que pueda, no olvide la segunda página.

Señale con el dedo y cuente estos puntos uno por uno empezando aquí y yendo hacia acá. Cuéntelos en voz alta de manera que yo lo pueda oír y dígame cuántos puntos hay.

Lea estos números. ¿Cuál es este? ¿Y este?

Si usted tiene 3 centavos y gasta uno de ellos, ¿cuántos le quedan? ¿Cuánto es 3 y 4 manzanas? José tenía 9 bolitas. El perdió 3 de ellas. ¿Cuántas le quedaron?