

50 Hole Dexterity Test Pegboard

instructions for use

- Measures fine and gross motor dexterity and coordination for hands, fingers, and arms
- Assesses fingertip dexterity necessary for assembly tasks and precise hand movements
- Used extensively for employee selection in jobs requiring manual dexterity skills
- Ideal for physical therapy, occupational therapy, vocational evaluation, and pre-employment screening
- Helps establish baseline data for injury rehabilitation and documents patient progress or degree of disability
- Assists in determining ability and aptitude for work-related applications requiring manual dexterity
- Complete kit includes pins, collars, washers, and examiner's manual



Product Overview

The Baseline® 50 Hole Dexterity Test is a standardized manual dexterity assessment instrument designed to evaluate fine motor coordination and bilateral hand function. This test measures an individual's capacity to perform precise manipulative movements under timed conditions, providing quantitative data on unimanual and bimanual finger dexterity.

Originally developed in the 1940s for personnel selection in industrial settings (Tiffin, 1968; Tiffin & Asher, 1948), pegboard tests have since become valuable tools in occupational therapy, physical therapy, neuropsychological assessment, and vocational rehabilitation. The 50 Hole Dexterity Test evaluates multiple aspects of hand function through a series of five subtests that progressively increase in complexity.

Intended Use

The Baseline® 50 Hole Dexterity Test is intended for use by qualified healthcare professionals including occupational therapists, physical therapists, and rehabilitation specialists to:

- Assess fine motor coordination and manual dexterity
- Evaluate unilateral and bilateral hand function
- Monitor progress in rehabilitation programs
- Screen for motor impairments affecting activities of daily living
- Provide objective measurements for clinical documentation
- Establish baseline performance for treatment planning

This test is appropriate for individuals aged 5 years and older who can follow multi-step directions and maintain seated positioning for the duration of testing.

Test Description

The Baseline® 50 Hole Dexterity Test consists of a rectangular board with two parallel vertical columns of 25 holes each (50 holes total), along with metal pins, washers, and collars for assembly tasks. Four shallow cups at the top of the board hold the test components.

The assessment comprises five distinct subtests:

1. Dominant Hand (30 seconds) - Measures unilateral dexterity of the preferred hand
2. Non-dominant Hand (30 seconds) - Measures unilateral dexterity of the non-preferred hand
3. Both Hands (30 seconds) - Measures bilateral coordination
4. Combined Score (calculated) - Sum of the three peg-placement subtests
5. Assembly (60 seconds) - Measures complex bimanual coordination and sequencing

Equipment Specifications

Standard Kit Includes:

- Test board with 50 holes arranged in two rows of 25 holes each
- 50 metal pins (25 per cup for right and left sides), 40 metal washers, 20 metal collars
- Storage compartments integrated into board design
- Evaluation form pad (25 sheets)
- Instruction manual

Additional Required Materials (not included):

- Stopwatch or timer with seconds display
- Sturdy table approximately 76 cm (30 inches) in height
- Chair providing stable seated support
- Adequate lighting for precise hand movements

Pre-Test Preparation

Administrator Preparation

Before conducting any assessments, the test administrator should:

- Thoroughly review all test procedures and scoring criteria
- Practice administering each subtest until comfortable with timing and demonstrations
- Ensure the ability to perform each task at average speed for demonstration purposes
- Prepare all necessary documentation and recording materials
- Verify proper functioning of timing device

Test Environment

Establish a testing environment that:

- Provides a quiet space free from distractions
- Offers adequate lighting for precise visual-motor tasks
- Includes a stable table at approximately 76 cm (30 inches) height
- Provides a comfortable chair allowing proper posture
- Maintains comfortable temperature
- Minimizes interruptions during testing

Subject Preparation

Before beginning the assessment:

- Verify the subject's dominant hand preference
- Ensure the subject is comfortably seated directly facing the pegboard
- Position the pegboard with the cup row at the top
- Place 25 pins in the far right cup
- Place 25 pins in the far left cup
- Place 40 washers in the left-of-center cup (for right-handed subjects)
- Place 20 collars in the right-of-center cup (for right-handed subjects)

Note: For left-handed subjects, reverse the positions of washers and collars.



Administration Procedures

General Instructions

Once the subject is properly positioned and testing materials are arranged, provide this introduction:

“This assessment evaluates how quickly and accurately you can perform precise hand movements. Before each part of the test, I will explain what to do and allow you to practice. Please make certain you understand the instructions before we begin the timed portion.”

Subtest 1: Dominant Hand (30 Seconds)

For right-handed subjects, this tests the right hand.

For left-handed subjects, this tests the left hand.

Instructions and Demonstration:

Demonstrate while stating:

“Pick up one pin at a time using only your [dominant] hand from the [corresponding side] cup. Starting with the topmost hole, insert each pin into the [corresponding] column. Work down the column, filling one hole at a time.”

Demonstrate by placing one pin in the top hole, then state:

“Leave this demonstration pin in place. Now practice placing three or four pins yourself. If you accidentally drop a pin during testing, do not stop to retrieve it. Simply select another pin from the cup and continue.”



Practice Trial:

Allow the subject to insert 3-4 practice pins. Observe for proper technique and correct any errors. Once confident the subject understands, say:

“Stop now. Please remove all practice pins and return them to the [corresponding] cup.”

Test Trial:

After all practice pins are returned, provide the test instructions:

“When I say ‘Begin,’ place as many pins as possible in the [corresponding] column, starting from the top hole and working downward. Move as quickly as you can while maintaining accuracy. Continue until I say ‘Stop.’ Are you ready?”

After receiving confirmation, clearly state “Begin” and simultaneously start the timer.

At exactly 30 seconds, clearly state “Stop.”

Scoring:

Count the number of pins successfully placed in holes. Record this score on the evaluation form. Leave all pins in place in the board.

Subtest 2: Non-Dominant Hand (30 Seconds)

For right-handed subjects, this tests the left hand. For left-handed subjects, this tests the right hand.

Instructions and Demonstration:

State: “Now we will test your [non-dominant] hand using the same procedure. Pick up one pin at a time using only your [non-dominant] hand from the [corresponding side] cup. Place each pin in the [corresponding] column, starting with the topmost hole. You may practice placing a few pins.”

Allow the subject to insert 3-4 practice pins. Then have them remove practice pins and return to cups.

Administer the 30-second test trial using the same procedure as Subtest 1.

Count and record the score. Leave pins in place. After both unilateral subtests, have the subject return all pins to their original cups.

Subtest 3: Both Hands (30 Seconds)

This subtest assesses simultaneous bilateral coordination.

Instructions and Demonstration:

State and demonstrate:

“In this part of the test, you will use both hands at the same time. Pick up one pin with your [dominant] hand from the [corresponding] cup. Simultaneously, pick up one pin with your [non-dominant] hand from the [other] cup. Place both pins at the same time in the top holes of both columns.”

Demonstrate simultaneous bilateral placement, then return demonstration pins to cups.

“The key is to move both hands together - picking up pins at the same time and placing them at the same time. Now practice placing several pairs of pins.”

Allow practice, then have subject remove practice pins. Administer the 30-second test trial.

Scoring:

Count the number of complete PAIRS of pins placed (not individual pins). If one hand placed more pins than the other, count only complete pairs. Record the score.

Subtest 4: Combined Score (Calculated)

This score is not derived from a separate test. Calculate the Combined Score by adding:

Combined Score = Dominant Hand + Non-dominant Hand + Both Hands

Subtest 5: Assembly (60 Seconds)

This subtest assesses complex bilateral coordination, sequencing ability, and continuous alternating hand movements.

Instructions and Demonstration:

State and demonstrate the following sequence:

“This final test requires both hands working together in a specific sequence. Watch carefully.”

Perform each step slowly while narrating:

1. With your [dominant] hand, pick up one pin from the [corresponding] cup.
2. While placing that pin (fig. 1), use your [non-dominant] hand to pick up a washer.
3. Once the pin is placed, drop the washer over the pin (fig. 2) with your [non-dominant] hand.
4. While placing the washer, use your [dominant] hand to pick up a collar.
5. Drop the collar over the pin (fig. 3) with your [dominant] hand.
6. While placing the collar, use your [non-dominant] hand to pick up another washer.
7. Drop this second washer over the collar (fig. 4).



figure 1

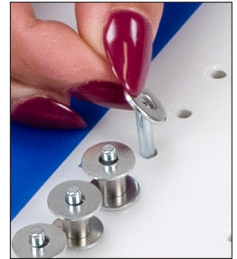


figure 2

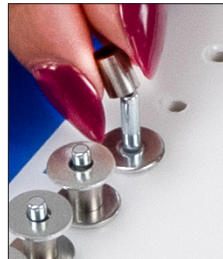


figure 3



figure 4



completed assembly

Show the completed assembly (pin, washer, collar, washer), then state:

“This completes one assembly. Now immediately start the next assembly in the adjacent hole below. Both hands should be continuously moving - when one hand places a piece, the other hand is already picking up the next piece.”

Allow the subject to complete 4-5 practice assemblies.

Administer the 60-second test trial.

Scoring:

Count the total number of individual pieces successfully assembled. Each complete assembly = 4 pieces (pin + washer + collar + washer). Count all complete assemblies and multiply by 4, then add any additional correctly placed pieces from an incomplete assembly.

Example:

7 complete assemblies + pin and washer from 8th = $(7 \times 4) + 2 = 30$ pieces

Trial Administration

Standard Protocol

The standardized protocol specifies administering THREE complete trials of all five subtests. Research demonstrates that multiple trials significantly increase test-retest reliability (Tiffin, 1968).

The three-trial administration provides:

- More reliable measurements of true ability
- Opportunity to observe performance consistency
- Reduced impact of initial nervousness
- Better baseline for tracking changes over time

Modified Single-Trial Protocol

While three trials are strongly recommended, a single-trial administration may be used when time constraints are significant. However, note that single-trial reliability is considerably lower (.37 to .82 vs. .76 to .89 for three trials). Document this modification clearly and interpret results with appropriate caution.

Scoring Procedures

Recording Scores

Use the provided Baseline® 50 Hole Dexterity Test Evaluation Form to record subject information, date, administrator name, dominant hand, and individual scores for each trial of each subtest.

Calculating Average Scores

After completing all three trials, calculate the average for each subtest:

Average Score = (Trial 1 + Trial 2 + Trial 3) ÷ 3

The average scores represent the most reliable estimate of performance capacity and should be used for comparison to normative data and clinical interpretation.

Normative Data

Mean Performance of Young Adults (One Trial Per Subtest)

	Age Groups				
	15-20	21-25	26-30	31-40	41-50
<i>Females</i>					
n	30	36	16	16	98
Preferred Hand	16.69	16.64	17.25	15.94	16.64
SD	2.16	2.31	1.38	1.61	2.10
Non-preferred Hand	16.10	15.89	16.13	15.63	15.95
SD	1.57	1.79	1.50	1.89	1.68
Both Hands	13.76	13.75	13.31	13.13	13.58
SD	1.41	1.54	1.45	1.31	1.45
Assemblies	41.83	42.47	40.44	41.44	41.77
SD	5.08	5.43	5.90	5.75	5.42
<i>Males</i>					
n	32	37	32	26	127
Preferred Hand	15.56	15.44	16.22	15.35	15.65
SD	1.52	1.71	1.81	1.72	1.71
Non-preferred Hand	15.09	15.08	15.41	15.12	15.17
SD	1.42	1.98	2.08	1.77	1.82
Both Hands	12.59	12.97	12.94	12.42	12.75
SD	1.56	1.18	1.29	1.65	1.42
Assemblies	40.25	38.89	39.13	37.50	39.01
SD	4.64	6.60	3.58	3.64	4.92

Note: Data were compiled from 225 healthy adults, largely right-handed (87.7%), with above average IQ, residing in a large city in Western Canada.

Source: Adapted from Yeudall et al. (1986).

Performance (One-Trial) in Older Adults, by Age and Sex

	Males		Females	
	Mean	SD	Mean	SD
<i>60-69 years</i>				
Right	12.7	1.5	14.3	1.3
Left	12.7	1.5	13.7	1.3
Both	10.2	1.3	10.9	1.5
Assembly	27.6	5.1	30.6	5.3
<i>70-79 years</i>				
Right	11.2	1.9	12.7	1.8
Left	10.7	2.1	11.8	1.8
Both	8.2	2.0	9.7	1.7
Assembly	23.1	5.5	25.0	5.8
<i>80+ years</i>				
Right	10.1	2.0	11.5	1.8
Left	9.8	1.7	10.7	2.1
Both	7.4	1.6	8.3	1.9
Assembly	18.5	5.2	21.8	5.5

Note: Each age group contained 60 males and 60 females.

Source: Adapted from DesRosiers et al., 1995

Normative Data

Peg-Placing Means, Standard Deviations, and Quartiles by Age and Gender for Japanese Americans (Two Trials per Subtest)

	Mean	SD	25th Percentile	Median	75th Percentile
<i>Males 70-79</i>					
Dominant Hand (n=52)	12.96	2.30	11	13	14.5
Non-dominant Hand (n=52)	11.85	2.08	10	11.5	14.0
<i>Females 70-79</i>					
Dominant Hand (n=39)	14.17	1.55	13	13.5	15
Non-dominant Hand (n=38)	13.31	2.14	12	13	14
<i>Males 80-89</i>					
Dominant Hand (n=17)	11.41	1.79	11	12	12.5
Non-dominant Hand (n=17)	11.47	2.52	9.5	12.5	13.5
<i>Females 80-89</i>					
Dominant Hand (n=26)	13.08	2.34	11.5	12.5	14.5
Non-dominant Hand (n=25)	11.28	1.49	11.0	11.5	12.5

Note: Age and gender but not education or language spoken significantly affected test scores.

Source: From McCurry et al., personal communication, May 10, 2004

Normative Data

Mean Performance of Adults (Three Trials per Subtest)

	Age Groups				
	40-49	50-59	60-69	70-79	80-89
<i>Males</i>					
n	19	20	24	17	11
Preferred Hand	14.6	14.4	13.6	13.0	10.8
SD	2.08	2.15	1.74	1.90	1.33
Non-preferred Hand	14.4	13.9	13.1	12.4	10.6
SD	2.35	2.19	1.56	1.48	1.84
Both Hands	12.2	11.9	10.9	10.4	8.5
SD	2.43	2.22	1.46	1.27	1.21
Assemblies	34.9	33.8	28.0	27.5	21.5
SD	7.66	9.66	5.06	5.06	4.81
Pref. minus nonpref.	0.16	0.23	0.44	0.59	0.18
SD	1.19	1.21	1.86	0.93	1.46
<i>Females</i>					
n	21	27	29	31	13
Preferred Hand	15.9	15.0	14.6	13.8	12.9
SD	1.45	1.56	2.03	1.27	1.80
Non-preferred Hand	15.2	14.4	13.9	12.9	11.3
SD	1.48	1.69	1.78	1.52	2.05
Both Hands	13.1	12.1	11.6	10.5	9.2
SD	1.56	1.30	1.87	1.19	1.92
Assemblies	39.8	34.6	31.7	29.1	21.9
SD	4.54	8.21	6.83	4.85	4.54
Pref. minus nonpref.	0.73	0.63	0.71	0.94	1.56
SD	1.05	1.31	1.23	1.39	1.24

Source: Agnew et al., 1988.

Normative Data

Performance of Children (One Trial per Subtest) - Boys

Age	n	Preferred Hand		Nonpreferred Hand		Both Hands		Assembly	
		M	SD	M	SD	M	SD	M	SD
5:0-5:5	30	9.33	1.81	8.40	1.33	6.73	1.17	14.10	3.29
5:6-5:11	30	9.93	1.51	8.83	1.95	6.97	1.54	15.57	3.56
6:0-6:5	30	9.77	1.57	9.13	1.83	7.30	1.53	15.93	2.94
6:6-6:11	30	11.57	1.45	10.17	2.17	8.23	1.77	19.20	3.84
7:0-7:5	30	11.67	1.67	11.00	1.70	8.77	1.41	19.23	4.95
7:6-7:11	30	12.07	1.95	11.23	1.68	9.57	1.59	20.40	4.10
8:0-8:5	30	12.70	1.60	12.17	1.51	9.83	1.51	23.20	3.80
8:6-8:11	30	13.90	2.19	12.57	1.85	10.90	1.73	24.47	5.35
9:0-9:5	30	13.33	1.60	12.43	1.59	10.50	1.48	24.57	3.75
9:6-9:11	30	13.87	1.91	12.87	2.05	11.33	1.65	27.37	4.55
10:0-10:5	30	14.03	1.88	12.87	1.72	10.93	1.84	26.37	6.15
10:6-10:11	30	14.73	1.51	13.90	1.84	11.77	1.65	28.17	5.38
11:0-11:5	30	14.93	1.86	14.00	1.98	11.30	1.68	29.53	6.19
11:6-11:11	30	14.83	1.60	13.93	1.60	12.27	1.41	31.33	5.19
12:0-12:5	30	14.83	1.78	13.67	2.02	11.67	1.52	31.13	5.78
12:6-12:11	30	15.37	2.81	14.00	2.38	11.87	1.87	30.13	6.08
13:0-13:5	40	15.15	1.92	13.90	2.00	11.85	1.58	33.73	5.00
13:6-13:11	30	14.87	1.72	14.10	1.47	11.53	1.80	34.57	5.88
14:0-14:5	30	15.67	1.47	14.40	1.57	12.03	1.67	33.97	6.58
14:6-14:11	30	14.70	1.49	14.33	1.65	12.20	1.61	31.37	7.24
15:0-15:5	30	15.57	1.59	14.87	1.50	12.57	1.48	32.20	6.21
15:6-15:11	23	15.09	1.50	14.30	1.61	12.65	1.30	33.04	6.24

Note: Data were derived from 1,334 normal schoolchildren. Source: Adapted from Gardner & Broman (1979)

Normative Data

Performance of Children (One Trial per Subtest) - Girls

Age	n	Preferred Hand		Nonpreferred Hand		Both Hands		Assembly	
		M	SD	M	SD	M	SD	M	SD
5:0-5:5	30	10.00	1.53	8.50	1.36	6.97	1.25	14.70	2.55
5:6-5:11	30	9.30	1.73	9.13	1.59	6.77	1.28	14.37	4.02
6:0-6:5	30	11.43	1.33	10.23	1.52	8.53	1.46	18.03	3.54
6:6-6:11	30	11.87	1.68	10.47	1.38	8.67	1.79	20.63	4.27
7:0-7:5	30	12.03	1.65	10.47	2.08	8.83	1.80	19.77	4.49
7:6-7:11	30	12.47	1.53	11.50	1.80	9.50	1.70	20.20	4.61
8:0-8:5	30	13.07	1.78	12.03	1.40	10.10	1.81	21.93	4.31
8:6-8:11	30	13.77	1.63	12.30	1.26	10.43	1.59	24.50	5.83
9:0-9:5	30	13.37	1.79	11.83	2.12	9.83	1.62	24.97	6.81
9:6-9:11	30	14.40	1.52	13.03	1.67	11.60	1.65	29.07	6.01
10:0-10:5	30	15.13	1.48	13.2	1.35	11.33	1.42	27.90	5.10
10:6-10:11	30	15.47	1.59	13.63	1.33	12.27	1.46	31.70	6.02
11:0-11:5	30	14.90	1.79	14.00	2.00	11.67	1.63	32.77	5.50
11:6-11:11	30	15.70	1.84	13.83	1.88	12.00	1.82	33.47	7.24
12:0-12:5	30	15.57	1.65	14.20	1.73	12.00	1.23	34.57	5.20
12:6-12:11	30	15.40	1.96	14.07	1.66	12.03	1.65	34.70	7.52
13:0-13:5	40	15.55	1.69	14.15	1.64	12.03	1.44	34.85	5.57
13:6-13:11	37	15.38	1.58	14.09	1.44	12.13	1.31	37.40	5.34
14:0-14:5	30	16.33	1.73	14.93	1.78	12.63	1.61	36.43	6.76
14:6-14:11	30	16.03	1.77	14.83	1.66	12.40	1.94	34.17	6.62
15:0-15:5	28	16.68	1.49	14.89	1.40	12.89	1.64	36.89	7.75
15:6-15:11	31	16.42	1.84	15.29	2.04	12.77	1.45	37.35	8.24

Note: Data were derived from 1,334 normal schoolchildren. Source: Adapted from Gardner & Broman (1979)

Normative Data

Performance of Children: Percentiles

Percentiles for Boys: Preferred Hand

Age	n	10	20	30	40	50	60	70	80	90
5:0-5:5	30	7.0	8.0	8.0	9.0	9.0	10.0	10.0	11.0	11.0
5:6-5:11	30	8.0	9.0	9.0	10.0	10.0	10.0	11.0	11.8	12.0
6:0-6:5	30	7.1	9.0	9.0	9.0	9.5	10.0	11.0	11.0	11.9
6:6-6:11	30	9.1	10.2	11.0	11.0	12.0	12.0	12.0	13.0	13.0
7:0-7:5	30	9.1	10.2	11.0	11.4	12.0	12.0	12.7	13.0	13.9
7:6-7:11	30	9.0	10.0	11.0	12.0	12.0	12.6	13.0	14.0	14.0
8:0-8:5	30	11.0	12.0	12.0	12.0	13.0	13.0	14.0	14.0	14.0
8:6-8:11	30	11.1	12.0	12.3	13.0	14.0	15.0	15.0	16.0	17.0
9:0-9:5	30	11.0	12.0	12.0	13.0	13.0	14.0	15.0	15.0	15.0
9:6-9:11	30	12.0	12.0	13.0	13.0	14.0	14.6	15.0	15.0	15.9
10:0-10:5	30	11.1	12.2	13.0	14.0	14.0	15.0	15.0	15.8	16.9
10:6-10:11	30	13.0	13.2	14.0	14.0	15.0	15.0	15.0	16.0	17.0
11:0-11:5	30	13.0	13.0	13.0	14.0	14.5	16.0	16.0	16.8	17.0
11:6-11:11	30	13.0	14.0	14.0	14.0	15.0	15.0	15.0	16.8	17.0
12:0-12:5	30	13.0	13.0	14.0	14.0	14.5	15.0	15.7	16.0	17.9
12:6-12:11	30	13.0	13.2	15.0	15.0	15.0	15.0	16.0	17.0	18.9
13:0-13:5	40	12.1	14.0	14.0	15.0	15.0	15.0	16.0	16.8	18.0
13:6-13:11	30	13.0	13.0	14.0	14.4	15.0	15.0	16.0	16.0	17.0
14:0-14:5	30	14.0	14.0	14.3	15.0	16.0	16.0	17.0	17.0	17.9
14:6-14:11	30	13.0	13.0	14.0	14.4	15.0	15.0	15.0	16.0	16.9
15:0-15:5	30	14.0	14.0	14.0	15.0	15.5	16.0	16.7	17.0	18.0
15:6-15:11	23	13.0	14.0	14.0	15.0	15.0	15.0	16.0	17.0	17.0

Note: Data were derived from 1,334 normal schoolchildren. Source: Adapted from Gardner & Broman (1979).

Normative Data

Performance of Children: Percentiles

Percentiles for Boys: Non-Preferred Hand

Age	n	10	20	30	40	50	60	70	80	90
5:0-5:5	30	6.1	7.0	8.0	8.0	8.5	9.0	9.0	9.0	10.0
5:6-5:11	30	6.1	8.0	8.0	8.0	9.0	9.6	10.0	10.0	11.0
6:0-6:5	30	6.0	8.0	9.0	9.0	9.0	10.0	10.0	10.0	12.0
6:6-6:11	30	7.1	8.2	9.0	10.0	10.5	11.0	11.7	12.0	13.0
7:0-7:5	30	9.0	10.0	10.0	11.0	11.0	11.0	12.0	12.0	12.9
7:6-7:11	30	9.1	10.0	10.0	11.0	11.0	11.0	12.0	13.0	13.9
8:0-8:5	30	10.0	11.0	11.0	12.0	12.5	13.0	13.0	13.0	14.0
8:6-8:11	30	10.1	11.0	11.0	12.0	12.0	13.0	13.7	14.0	15.9
9:0-9:5	30	10.0	11.0	11.3	12.0	13.0	13.0	13.7	14.0	14.0
9:6-9:11	30	10.0	11.2	12.0	12.0	12.0	13.0	14.0	15.0	16.0
10:0-10:5	30	10.1	12.0	12.0	13.0	13.0	13.6	14.0	14.0	15.0
10:6-10:11	30	11.0	12.2	13.0	13.0	14.0	14.0	15.0	15.8	17.0
11:0-11:5	30	12.0	13.0	13.0	13.0	13.5	14.0	15.0	15.8	16.9
11:6-11:11	30	11.1	13.0	13.0	14.0	14.0	14.0	15.0	15.0	16.0
12:0-12:5	30	12.0	13.0	13.0	13.0	14.0	14.0	15.0	15.0	16.0
12:6-12:11	30	11.0	12.2	13.0	13.4	14.0	14.0	15.0	16.0	16.9
13:0-13:5	40	11.0	11.2	13.0	14.0	14.0	15.0	15.0	16.0	16.0
13:6-13:11	30	12.0	13.0	13.0	14.0	14.0	14.0	15.0	15.8	16.0
14:0-14:5	30	12.1	13.0	14.0	14.0	14.5	15.0	15.7	16.0	16.0
14:6-14:11	30	11.2	13.2	14.0	14.0	14.5	15.0	15.0	15.8	16.0
15:0-15:5	30	13.0	14.0	14.3	15.0	15.0	15.0	16.0	16.0	16.9
15:6-15:11	23	12.0	13.0	13.0	14.0	15.0	15.0	15.0	16.0	16.6

Note: Data were derived from 1,334 normal schoolchildren. Source: Adapted from Gardner & Broman (1979).

Normative Data

Performance of Children: Percentiles

Percentiles for Boys: Both Hands

Age	n	10	20	30	40	50	60	70	80	90
5:0-5:5	30	5.1	6.0	6.0	6.0	7.0	7.0	7.0	8.0	8.0
5:6-5:11	30	5.0	6.0	6.0	6.4	7.0	7.0	8.0	8.0	9.0
6:0-6:5	30	5.0	6.3	6.3	7.0	7.0	7.6	8.0	9.0	9.0
6:6-6:11	30	6.0	8.0	8.0	8.0	8.0	8.6	9.0	9.0	10.9
7:0-7:5	30	7.0	8.0	8.0	8.0	8.0	9.0	10.0	10.0	10.0
7:6-7:11	30	8.0	8.0	8.0	9.0	9.5	10.0	10.7	11.0	12.0
8:0-8:5	30	8.0	9.0	9.0	9.0	10.0	10.0	11.0	11.0	12.0
8:6-8:11	30	9.0	10.0	10.0	10.0	11.0	11.0	12.0	12.8	13.0
9:0-9:5	30	8.1	10.0	10.0	10.0	10.0	11.0	11.0	12.0	12.0
9:6-9:11	30	9.1	10.0	10.0	11.0	11.0	11.6	12.0	13.0	13.9
10:0-10:5	30	9.0	10.0	10.0	10.4	11.0	11.0	11.0	12.8	13.9
10:6-10:11	30	10.0	11.0	11.0	11.0	12.0	12.0	12.0	13.0	14.0
11:0-11:5	30	9.0	10.3	10.3	11.0	11.0	12.0	12.7	13.0	13.0
11:6-11:11	30	11.0	12.0	12.0	12.0	12.0	13.0	13.0	13.8	14.0
12:0-12:5	30	9.1	11.0	11.0	11.0	12.0	12.0	12.0	12.8	14.0
12:6-12:11	30	9.1	11.0	11.0	12.0	12.0	12.6	13.0	13.8	14.0
13:0-13:5	40	9.1	11.0	11.0	11.4	12.0	12.0	13.0	13.0	14.0
13:6-13:11	30	9.1	11.0	11.0	11.0	11.0	12.0	12.0	13.0	14.0
14:0-14:5	30	10.1	11.0	11.0	11.0	12.0	12.0	13.0	14.0	14.0
14:6-14:11	30	10.0	11.0	11.0	12.0	12.0	12.0	13.0	14.0	15.0
15:0-15:5	30	10.1	12.0	12.0	12.0	13.0	13.0	13.0	14.0	14.9
15:6-15:11	23	11.0	12.0	12.0	12.0	13.0	13.0	13.0	14.0	14.0

Note: Data were derived from 1,334 normal schoolchildren. Source: Adapted from Gardner & Broman (1979).

Normative Data

Performance of Children: Percentiles

Percentiles for Boys: Assembly

Age	n	10	20	30	40	50	60	70	80	90
5:0-5:5	30	10.0	11.2	12.0	13.0	14.0	14.6	16.0	16.0	17.9
5:6-5:11	30	10.1	12.2	14.0	15.0	16.0	16.0	17.7	18.0	20.9
6:0-6:5	30	12.1	14.0	15.0	15.0	16.0	16.0	17.0	19.0	20.0
6:6-6:11	30	14.0	16.2	18.0	18.0	19.5	20.6	22.0	22.8	24.0
7:0-7:5	30	12.1	16.0	17.3	18.4	19.0	20.6	21.7	23.0	26.7
7:6-7:11	30	16.0	17.2	18.3	19.4	21.0	22.0	22.7	24.0	25.0
8:0-8:5	30	19.0	20.2	21.0	22.4	23.5	24.0	24.0	26.8	28.9
8:6-8:11	30	18.0	20.0	20.3	23.4	24.0	25.0	27.1	30.0	32.0
9:0-9:5	30	20.0	21.2	23.0	24.0	24.0	26.0	26.0	27.0	28.0
9:6-9:11	30	21.1	24.0	24.3	25.4	26.0	29.2	30.7	31.8	32.0
10:0-10:5	30	19.1	20.2	24.0	25.0	26.0	26.0	28.7	30.0	35.7
10:6-10:11	30	22.0	24.0	25.3	28.4	29.0	30.0	30.0	31.0	33.8
11:0-11:5	30	22.0	22.2	26.0	27.4	28.0	31.0	32.0	34.6	39.9
11:6-11:11	30	25.1	27.0	28.6	30.0	31.0	32.6	33.7	35.0	39.0
12:0-12:5	30	25.0	26.0	27.0	29.0	29.0	32.6	35.4	36.0	40.9
12:6-12:11	30	23.1	25.4	28.0	29.0	30.5	32.2	34.0	35.8	37.0
13:0-13:5	40	27.0	30.0	31.0	32.0	34.0	34.8	36.0	37.0	40.9
13:6-13:11	30	27.1	30.0	30.0	33.0	34.5	35.6	36.7	39.8	43.8
14:0-14:5	30	26.1	29.2	31.0	32.0	34.0	36.0	38.7	40.0	41.0
14:6-14:11	30	23.0	25.2	26.3	29.0	30.5	32.0	34.7	35.8	45.4
15:0-15:5	30	24.0	26.0	28.0	31.4	33.5	35.6	36.0	37.8	39.9
15:6-15:11	23	24.4	26.8	29.4	32.0	33.0	34.4	35.8	39.0	42.0

Note: Data were derived from 1,334 normal schoolchildren. Source: Adapted from Gardner & Broman (1979).

Normative Data

Performance of Children: Percentiles

Percentiles for Girls: Preferred Hand

Age	n	10	20	30	40	50	60	70	80	90
5:0-5:5	30	8.0	8.2	9.3	10.0	10.0	10.6	11.0	11.0	12.0
5:6-5:11	30	7.0	8.0	8.0	9.0	9.5	10.0	11.0	11.0	11.0
6:0-6:5	30	9.1	10.2	11.0	11.0	11.5	12.0	12.0	12.0	13.0
6:6-6:11	30	10.1	11.0	11.0	11.0	11.0	12.0	13.0	14.0	14.0
7:0-7:5	30	10.0	11.0	11.0	12.0	12.0	12.6	13.0	13.0	14.9
7:6-7:11	30	10.1	11.0	12.0	12.0	13.0	13.0	13.0	14.0	14.0
8:0-8:5	30	11.0	12.0	12.0	12.4	13.0	13.0	14.0	14.8	15.9
8:6-8:11	30	12.0	12.0	13.0	13.0	14.0	14.0	14.7	15.0	16.9
9:0-9:5	30	10.1	12.0	13.0	13.0	13.0	14.0	14.0	15.0	16.0
9:6-9:11	30	12.0	13.0	14.0	14.0	14.0	15.0	15.0	16.0	16.9
10:0-10:5	30	13.0	14.0	14.0	15.0	15.0	15.0	16.0	16.0	17.9
10:6-10:11	30	13.1	14.0	14.3	15.0	15.5	16.0	16.0	16.8	17.9
11:0-11:5	30	12.0	13.2	14.0	15.0	15.0	15.0	15.7	16.8	17.0
11:6-11:11	30	14.0	14.0	15.0	15.0	16.0	16.0	17.0	17.0	18.0
12:0-12:5	30	14.0	14.0	14.0	15.0	15.0	16.0	17.0	17.0	17.9
12:6-12:11	30	12.1	13.2	15.0	15.0	16.0	16.0	16.0	17.0	18.0
13:0-13:5	40	14.0	14.0	15.0	15.0	16.0	16.0	16.0	17.0	18.0
13:6-13:11	30	13.3	14.0	14.0	15.0	15.0	15.0	16.0	17.0	18.0
14:0-14:5	30	14.1	15.0	15.0	16.0	16.0	16.0	17.0	17.8	19.0
14:6-14:11	30	14.0	14.0	15.0	15.0	16.0	16.6	17.0	17.0	18.9
15:0-15:5	30	15.0	15.0	16.0	16.0	17.0	17.0	18.0	18.0	19.0
15:6-15:11	23	14.0	15.0	15.6	16.0	16.0	17.0	17.4	18.0	19.0

Note: Data were derived from 1,334 normal schoolchildren. Source: Adapted from Gardner & Broman (1979).

Normative Data

Performance of Children: Percentiles

Percentiles for Girls: Non-Preferred Hand

Age	n	10	20	30	40	50	60	70	80	90
5:0-5:5	30	7.0	7.0	8.0	8.0	9.0	9.0	9.0	10.0	10.0
5:6-5:11	30	7.0	7.2	8.0	8.4	9.0	10.0	10.0	11.0	11.0
6:0-6:5	30	8.0	8.2	9.3	10.0	10.0	11.0	11.0	11.8	12.0
6:6-6:11	30	9.0	9.2	10.0	10.0	10.0	11.0	11.0	12.0	12.0
7:0-7:5	30	8.0	9.0	10.0	10.0	11.0	11.0	11.0	12.0	13.0
7:6-7:11	30	9.0	10.0	10.3	11.0	11.0	12.0	13.0	13.0	14.0
8:0-8:5	30	10.0	11.0	11.0	12.0	12.0	12.0	12.7	13.0	14.0
8:6-8:11	30	11.0	11.0	12.0	12.0	12.0	12.6	13.0	13.8	14.0
9:0-9:5	30	9.0	10.0	11.0	11.0	11.5	12.6	13.0	14.0	14.9
9:6-9:11	30	11.0	11.0	12.0	12.0	13.0	13.6	14.0	14.8	15.0
10:0-10:5	30	11.0	12.0	13.0	13.0	13.0	13.6	14.0	14.8	15.0
10:6-10:11	30	11.2	13.0	13.0	13.4	14.0	14.0	14.0	14.8	15.0
11:0-11:5	30	10.2	12.4	14.0	14.0	14.0	15.0	15.0	15.0	16.8
11:6-11:11	30	11.0	12.0	13.0	14.0	14.0	14.0	15.0	15.0	16.0
12:0-12:5	30	12.0	13.0	13.3	14.0	14.0	14.0	15.0	16.0	16.9
12:6-12:11	30	12.0	13.0	13.0	13.0	14.0	14.0	15.0	15.0	16.9
13:0-13:5	40	12.1	13.0	13.0	13.4	14.0	14.0	15.0	16.0	16.0
13:6-13:11	30	12.0	13.0	14.0	14.0	14.0	15.0	15.0	15.0	16.0
14:0-14:5	30	13.0	13.0	14.0	15.0	15.0	15.0	15.7	16.0	17.0
14:6-14:11	30	13.0	13.2	14.0	14.0	15.0	15.0	16.0	16.8	17.0
15:0-15:5	30	12.9	14.0	14.0	14.6	15.0	15.4	16.0	16.0	17.0
15:6-15:11	23	13.0	13.0	14.0	14.0	15.0	16.0	16.4	17.6	18.0

Note: Data were derived from 1,334 normal schoolchildren. Source: Adapted from Gardner & Broman (1979).

Normative Data

Performance of Children: Percentiles

Percentiles for Girls: Both Hands

Age	n	10	20	30	40	50	60	70	80	90
5:0-5:5	30	5.0	6.0	6.0	7.0	7.0	7.6	8.0	8.0	8.0
5:6-5:11	30	5.0	6.0	6.0	6.4	7.0	7.0	7.7	8.0	8.0
6:0-6:5	30	6.1	7.2	8.0	8.0	9.0	9.0	9.0	10.0	10.0
6:6-6:11	30	6.1	8.0	8.0	8.0	8.0	8.6	9.7	10.0	12.0
7:0-7:5	30	6.0	7.2	8.0	9.0	9.0	9.0	10.0	10.8	11.0
7:6-7:11	30	7.0	8.0	9.0	9.0	9.5	10.0	10.7	11.0	11.0
8:0-8:5	30	8.0	8.2	9.0	10.0	10.0	11.0	11.0	11.0	12.0
8:6-8:11	30	8.0	9.0	10.0	10.0	10.5	11.0	11.0	12.0	12.9
9:0-9:5	30	8.0	8.0	9.0	9.4	10.0	10.0	11.0	11.0	12.0
9:6-9:11	30	9.0	10.0	11.0	12.0	12.0	12.0	13.0	13.0	13.0
10:0-10:5	30	10.0	10.0	11.0	11.0	11.0	11.6	12.0	12.0	13.0
10:6-10:11	30	11.0	11.0	11.3	12.0	12.0	12.0	13.0	13.8	14.9
11:0-11:5	30	9.1	10.0	11.0	11.4	12.0	12.0	12.7	13.0	13.0
11:6-11:11	30	9.1	10.2	11.0	11.0	13.0	13.0	13.0	14.0	14.0
12:0-12:5	30	10.0	11.0	12.0	12.0	12.0	12.0	12.0	13.0	14.0
12:6-12:11	30	10.0	10.2	11.0	12.0	12.0	12.0	13.0	13.8	14.0
13:0-13:5	40	10.0	11.0	11.0	12.0	12.0	12.0	13.0	13.0	14.0
13:6-13:11	30	10.3	11.0	11.9	12.0	12.0	12.0	13.0	13.0	13.7
14:0-14:5	30	11.0	11.0	12.0	12.0	12.0	13.0	13.0	14.8	15.0
14:6-14:11	30	9.1	11.0	11.3	12.0	12.0	13.0	13.7	14.0	15.0
15:0-15:5	30	11.0	11.0	12.0	12.0	13.0	13.0	14.0	14.0	16.0
15:6-15:11	23	11.0	11.0	12.0	13.0	13.0	13.0	13.4	14.0	14.0

Note: Data were derived from 1,334 normal schoolchildren. Source: Adapted from Gardner & Broman (1979).

Normative Data

Performance of Children: Percentiles

Percentiles for Girls: Assembly

Age	n	10	20	30	40	50	60	70	80	90
5:0-5:5	30	11.1	13.0	13.0	14.0	15.0	15.6	16.0	17.0	18.0
5:6-5:11	30	9.0	11.0	12.3	13.4	14.0	15.6	16.0	17.0	20.0
6:0-6:5	30	14.0	16.0	16.0	16.0	17.0	18.0	20.0	22.0	23.9
6:6-6:11	30	16.0	17.0	18.0	19.0	20.0	21.0	22.7	25.6	27.8
7:0-7:5	30	14.0	15.2	17.0	18.0	19.5	21.6	22.0	24.0	24.9
7:6-7:11	30	14.0	16.0	17.0	18.4	19.5	21.6	23.4	25.8	26.9
8:0-8:5	30	16.0	17.0	20.0	21.0	22.0	23.0	23.0	24.8	28.9
8:6-8:11	30	18.0	19.2	20.3	21.4	23.0	24.6	27.4	31.8	32.0
9:0-9:5	30	18.0	19.0	20.3	22.0	23.5	26.0	29.0	31.8	16.0
9:6-9:11	30	22.1	23.2	26.0	27.0	28.0	31.0	32.0	34.8	37.9
10:0-10:5	30	20.3	23.2	26.0	27.0	28.0	29.0	29.7	30.8	35.8
10:6-10:11	30	24.1	27.0	28.3	29.4	30.5	31.6	35.7	37.8	39.8
11:0-11:5	30	25.1	28.0	29.3	31.4	32.5	34.0	35.7	37.0	40.9
11:6-11:11	30	22.2	25.4	28.3	31.0	34.5	37.0	39.0	40.0	41.0
12:0-12:5	30	28.0	31.0	32.0	34.0	34.0	34.6	36.7	39.0	43.6
12:6-12:11	30	24.0	28.0	30.3	32.8	35.0	36.0	38.7	41.7	45.7
13:0-13:5	40	27.8	31.2	32.3	33.4	35.0	37.6	38.0	39.0	41.9
13:6-13:11	30	29.5	33.0	34.9	36.4	38.0	38.0	40.0	42.0	44.1
14:0-14:5	30	25.3	30.2	34.0	34.0	36.0	38.0	40.7	43.0	45.9
14:6-14:11	30	27.1	28.2	30.3	32.0	33.0	35.2	37.7	40.8	44.9
15:0-15:5	30	28.7	29.8	31.7	33.6	35.5	38.4	41.3	43.2	50.2
15:6-15:11	23	23.2	29.4	33.0	36.8	39.0	40.0	41.0	43.0	47.8

Note: Data were derived from 1,334 normal schoolchildren. Source: Adapted from Gardner & Broman (1979).

Mean Performance in Children, by Age (One Trial per Hand)

Age*			Right Hand			Left Hand			Both Hands		
			M	SD	Range	M	SD	Range	M	SD	Range
2:6-2:11	10	10	4.70	1.08	3-7	4.05	1.15	2-7	2.95	1.28	0-5
3:0-3:5	10	14	5.54	1.62	3-9	5.13	1.42	2-8	3.63	1.53	0-6
3:6-3:11	10	15	6.80	1.26	4-9	6.00	1.38	3-8	4.20	1.23	2-7
4:0-4:5	23	17	8.08	1.49	4-11	6.68	1.25	4-9	5.23	1.44	2-8
4:6-4:11	27	19	9.07	1.58	6-13	8.20	1.56	4-11	6.07	1.20	4-9
5:0-5:5	15	16	10.16	1.77	7-14	9.19	2.02	6-14	6.81	1.76	4-10
5:6-5:11	10	10	9.90	1.59	7-13	9.00	1.26	6-11	6.35	1.69	3-9

Source: From Wilson et al., 1982. *Age is Years.Months

Normative Data

Performance (Sum of Three Trials) in Adolescents, by Age and Gender

	Males			Females		
	N	Mean	SD	N	Mean	SD
14-15 years	26			28		
Right		49.5	4.0		51.6	4.8
Left		46.4	5.0		47.9	5.0
Both		39.5	5.1		40.3	3.6
Assembly		119.7	18.4		114.0	17.0
16-17 years	32			33		
Right		49.6	4.5		52.6	4.4
Left		47.8	4.9		49.4	5.2
Both		40.2	4.0		42.4	4.3
Assembly		119.8	18.2		122.4	18.2
18-19 years	29			28		
Right		49.5	5.4		54.8	5.8
Left		48.0	4.6		51.1	4.1
Both		40.4	4.3		44.3	4.9
Assembly		123.2	15.4		134.5	16.4

Note: Based on a sample of 176 males and females, aged 14-19 years, with no history of neuromuscular or orthopedic dysfunction that could affect finger dexterity.
Source: Adapted from Mathiowetz et al., 1986.

Normative Data Interpretation

Performance Variables

Research has identified several demographic variables that influence performance:

Age: Performance typically improves from childhood through young adulthood, plateaus during middle age, and gradually declines in older age. Use age-appropriate comparison data.

Gender: Females tend to achieve higher scores on fine motor dexterity tasks. This difference may be partially explained by average finger size differences.

Hand Dominance: Performance is typically superior with the dominant hand compared to the non-dominant hand.

Practice Effects: Scores typically improve with repeated administrations. Some improvement may reflect practice effects rather than true functional change

Clinical Interpretation

Scores should be interpreted in context of:

- The subject's age, gender, and hand dominance
- The reason for referral and clinical presentation
- Comparison to previous performance if available
- Functional limitations reported by the subject
- Other assessment findings



Safety and Precautions

Contraindications

Do not administer this test to individuals with:

- Acute pain limiting hand or finger movement
- Open wounds or skin conditions on the hands
- Acute inflammation or infection of the hand/upper extremity
- Medical instability requiring bed rest
- Cognitive impairment preventing comprehension of instructions

 **WARNING:** The small metal components present a choking hazard. Use appropriate clinical judgment with young children (minimum recommended age 5 years) and individuals with cognitive impairments.

Infection Control

Between each subject:

- Clean the pegboard surface with appropriate disinfectant
- Wipe all pins, washers, and collars with disinfectant
- Allow materials to air dry completely
- Follow facility-specific infection control protocols

Care and Maintenance

To maintain test validity and prolong equipment life

- Store in a clean, dry environment away from extreme temperatures
- Keep metal components free from rust or corrosion
- Inspect holes for deformation that might affect pin insertion
- Verify all components are present before testing
- Replace missing or damaged components promptly
- Clean regularly according to infection control protocols

References

The manual dexterity testing methodology described in this document is based on standardized procedures established in the following foundational references:

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