

# SEASHORE MEASURES OF MUSICAL TALENTS

Seashore — Lewis — Saetveit

## MANUAL

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The test described in this manual has been designed for use with answer forms published or authorized by THE PSYCHOLOGICAL CORPORATION. If other answer forms are used, THE PSYCHOLOGICAL CORPORATION takes no responsibility for the meaningfulness of scores.

## INTRODUCTION

The trend toward separate measurement of many human abilities has grown out of a realization that skills vary in degree in any individual and that it is as important to understand intra-individual differences — strengths and weaknesses — as to have indications of comparative standing among other individuals. Knowledge about many distinct aspects of the counselee is an essential to informed counseling.

One important area of ability not tapped by typical scholastic or general aptitude tests is that of musical ability. Some of the uses of a musical aptitude test are: educational and vocational counseling, admission to music instruction in schools, and selection for membership in bands and other musical organizations. Not all of the facets of musical aptitude are known, but there are several fundamental capacities that can be assessed.

The *Seashore Measures of Musical Talents* provide separate measures for six of these capacities: pitch, loudness, rhythm, time, timbre, and tonal memory. The tests have had a long history of wide application. The original series was published in 1919 and continued unchanged for twenty years, during which time extensive research was accomplished with the tests. In 1939 a revision was completed in which the precision of the stimuli was improved, all items were carefully analyzed, and the timbre test replaced the consonance test.<sup>1</sup>

The *Seashore Measures of Musical Talents* were designed for use with subjects from fourth grade level up. Although norms are presented only for various educational levels, the tests have been successfully used with adults.

### DESCRIPTION OF THE TESTS

The *Seashore Measures of Musical Talents* are presented on a single 33 $\frac{1}{3}$  rpm Long Playing recording, which replaces the earlier 78 rpm phonograph records. Those who have the 78 rpm records may continue to use them. There is no change in test content. The same norms are applicable regardless of whether the 78 rpm or the 33 $\frac{1}{3}$  rpm recording has been used. Interpretation of the results remains unchanged. Subjects indicate their responses on especially designed IBM answer sheets. The same answer sheet and scoring key are used with either version. The six tests are administered separately and measure different aspects of musical ability. A detailed account of the content, construction, and analysis of the tests may be found in a report

by Saetveit, Lewis, and Seashore (31).<sup>2</sup> The following is a summary description.

**PITCH.** In the test of the sense of pitch, 50 pairs of tones are presented. In each pair the listener is to determine whether the second tone is higher or lower in pitch than the first. The stimuli were derived from a beat-frequency oscillator through a circuit producing pure tones lacking in harmonics and overtones. The tones are at about 500 cycles and have a duration of .6 second each. Frequency differences between the tones in the pairs are as follows:

Item Numbers	Differences in Cycles
1-5	17
6-12	12
13-22	8
23-32	5
33-40	4
41-45	3
46-50	2

**LOUDNESS.** Fifty pairs of tones are presented. The subject is to indicate for each pair whether the second tone is stronger or weaker than the first. Stimuli were derived from the same apparatus that was used for the pitch test, but the frequency was held constant at 440 cycles. Intensity differences between the tones in the pairs are as follows:

Item Numbers	Differences in Decibels
1-5	4.0
6-10	2.5
11-20	2.0
21-30	1.5
31-40	1.0
41-50	0.5

**RHYTHM.** Thirty pairs of rhythmic patterns comprise the sense of rhythm test. The subject is to indicate whether the two patterns in each pair are the same or different. The source of the stimuli was a beat-frequency oscillator set at 500 cycles. Tempo is constant at the rate of 92 quarter notes per minute. The first ten items contain patterns of 5 notes in 2/4 time; the next ten, patterns of 6 notes in 3/4 time; and the last ten, patterns of 7 notes in 4/4 time.

<sup>1</sup>Series B, a more difficult series of measures of the same capacities, was also developed at that time, but has since been discontinued. The fineness of discrimination was such that use of this series was appropriate only with high fidelity reproducing equipment and in acoustically treated rooms, and then only for testing in a few limited situations.

<sup>2</sup>Numbers in parentheses refer to the bibliography at the end of this Manual.

**TIME.** The test of the sense of time consists of 50 pairs of tones of different durations. The subject is to determine whether the second tone is longer or shorter than the first. The source for the stimuli was the oscillator used in the pitch test. The duration of the tones was controlled automatically by a tape timing device for which the tape had been prepared with a predetermined schedule of time intervals. The frequency of the tones was held constant at 440 cycles. Differences in duration between the tones in pairs are as follows:

Item Numbers	Differences in Seconds
1-5	.30
6-10	.20
11-20	.15
21-30	.125
31-40	.10
41-45	.075
46-50	.05

**TIMBRE.** The purpose of the timbre test is to measure ability to discriminate between complex sounds which differ only in harmonic structure. It consists of 50 pairs of tones; in each pair the subject is to judge whether the tones are the same or different in timbre or tone quality. The tones were

produced with a special generator. Each tone is made up of a fundamental component, whose frequency is 180 cycles, and its first five overtones. Tonal structure is varied by reciprocal alteration in the intensities of the third and fourth harmonics. The following table shows the amounts by which the intensities of the third and fourth harmonics in variable tones differ from their levels in the standard tone:

Item Numbers	Decibel Increase in 4th Harmonic	Decibel Decrease in 3d Harmonic
1-10	10.0	9.6
11-20	8.5	4.0
21-30	7.0	2.4
31-40	5.5	1.2
41-50	4.0	0.7

**TONAL MEMORY.** This test has 30 pairs of tonal sequences consisting of 10 items each of three-, four-, and five-tone spans. In each pair one note is different in the two sequences, and the subject is to identify which note it is by number. A Hammond organ was used as the stimulus source. The 18 chromatic steps upward from middle C were used. Tempo was carefully controlled, and intensity is essentially constant.

## DIRECTIONS FOR ADMINISTRATION

### TESTING CONDITIONS

The *Seashore Measures of Musical Talents* should be administered in a room that has good acoustics and where there will be no noise disturbances either in the room or in adjacent areas. The test may be administered to individuals or to groups of any size, even up to 100 or more. In testing one person or a very small group no one should sit closer to the loud speaker than about five feet. When one sits closer one hears more of the surface noises from the recording and electronic noises from the amplification system. For large groups, good testing conditions are particularly important; the acoustics must permit the stimulus sounds to be heard clearly in all parts of the room. A proctor is needed to assist the examiner when groups of 25 or more are tested.

### MATERIALS NEEDED

Since the test is on a record, a good phonograph is needed in order to present the stimulus materials. The turntable of the phonograph should have no wobble and the sound reproduction of the machine should be of good fidelity. The examiner should try out the phonograph in the room where the test is to be given to assure that the volume, clarity, etc. are satisfactory. Loud playing should be avoided. It is essential that the examiner study the Manual before administering the test and he is encouraged to take the test himself before giving it to others. Before administering the test with the long-playing recording, the examiner should practice setting the needle in the groove between bands in order to avoid the confusing repetition of the last sounds of the preceding test or the cutting off of the first words and sounds of the test to be given. Often it is helpful to have the phonograph set up high and well illuminated, since this makes it easier to see where the needle should be set down.

Each subject needs to be supplied with a copy of the special IBM answer sheet on which to record his responses. He also needs at least one pencil and an eraser. Wooden or mechanical

pencils containing electrographic lead must be used if the answer sheets are to be scored with an electric scoring machine.

### TESTING TIME AND SCHEDULE

The actual testing time for the six parts of the measures is about 30 minutes, but an hour should be allowed for the whole procedure, including instructions, demonstration, etc. It is recommended that younger subjects be tested in at least two sessions.

### RETESTS

Whenever time and opportunity permit, giving a second trial of the test is a wise procedure. Of course, the first answer sheet should be removed before the second testing. It is particularly important that subjects making a poor or doubtful score be retested. When retesting a subject who has made a poor score, the examiner should exercise considerable patience in explaining the test, allowing adequate practice, and making certain that the subject knows what he is to do.

### GIVING THE TEST

After the group has been assembled and properly seated, explain that this is a test to measure some aspects of ability to hear sounds which occur in music, speech, and many practical activities. Tell the subjects that the test is played on the phonograph and that they are to put their answers on the special papers that are now to be distributed.

Distribute the answer sheets. Have the examinees print their names and other desired information in the spaces provided. If the answer sheets are to be machine scored, furnish the examinees with electrographic pencils. Explain thoroughly the system of marking IBM answer sheets (including use of special pencils when the answer sheets are to be machine scored) with a statement such as:

"Notice the many sets of small spaces on these answer sheets. You are to show your answers by making a clear, heavy, black mark in the proper space like this (*draw an example on the board and mark it*). In each section, place your answers one below another in Column A until that is filled, then down Column B, and so on. For each part of this test you will be given further instructions, but I want to make sure now that you know how to show your answers and that you realize that you should make your marks clear and black and between the lines as I have shown you. If you want to change an answer, draw a light circle around the mark that is wrong, and mark the space that you mean as your choice; then, at the end of the test you can go back and erase thoroughly the marks with circles around them as well as the circles themselves. You will not have time to erase while the test is going on."

To provide a warning which some have requested, in the long-playing recording an announcer prefacing each test with the words "This is the \_\_\_\_\_ test. Ready now for Column A." To reduce the chance that an examinee may lose his place, the announcer also says, "Column B," "Column C," and so on at the appropriate places in each test.

## PITCH

Say to the subjects,

"The first test measures your sense of Pitch. You will hear two tones, one right after the other. The second tone is either higher or lower in pitch than the first. Find the section of the answer sheet labeled 'Pitch.' You are to make a mark under the letter H on the answer sheet if the second tone is higher than the first; but mark under the L if the second tone is lower. Answer every time; if you are not sure, guess. Now we shall listen to a few practice notes. Do not mark any answers for these. Just see that you understand what you are to do. Ask any questions you want to during the practice."

Be sure that side 1 of the record is face up on the turntable. Give preliminary practice from different parts of band 1 demonstrating easy as well as difficult steps and allow the subjects to speak in competitive reaction to the sound. Ask everyone to respond at every trial, guessing in case of uncertainty. Continue this demonstration and the answering of questions until it is clear that everyone understands the nature of the procedure. Practice does not vitiate the actual test as long as consecutive items are not played and the subject does not know the scoring stencil. Provide similar practice sessions before each of the six tests.<sup>3</sup>

Make certain that everyone understands how and where he is to record his answers. State that there will be 50 pairs of notes in the Pitch test without interruption, and that no questions may be asked during the actual test. When everyone is ready, start the record and complete the band without interruption.

If two or more sessions are used for the testing, repeat enough of the general introductory directions to assure that the examinees understand what they are to do.

Before starting each test, be sure that the appropriate side of

the record is face up on the turntable, and the needle on the correct band.<sup>4</sup>

## LOUDNESS

After the Pitch test is completed, say,

"The next part tests your sense of Loudness. You will hear two tones which differ in loudness or strength. If the second is stronger, you should make a mark under the letter S for that item in the section of your answer sheet labeled 'Loudness.' If the second tone of the pair is weaker, make the mark between the dotted lines under the letter W. There are 50 pairs in this test. There is always a difference; if you are not sure, guess."

Give a few demonstration selections from different parts of band 2, with the warning that responses are not to be marked for them. When everybody understands what he is to do, give the signal for the group to be ready to begin the test. Play the whole Loudness section without interruption.

## RHYTHM

After the Loudness test is completed, say,

"The next part is a measure of sense of Rhythm. You will hear two rhythmic patterns, one right after the other. The second is either the same as the first or different from it. If they are the same, you should blacken the space under the letter S for that item in the section of your answer sheet labeled 'Rhythm.' If the two patterns are different, mark the space under the letter D. There are only 30 pairs of patterns in this test. You are to decide whether the rhythm in each pair is the same or different. Now listen to a few practice items, but do not make any marks on your papers for these."

Give a few demonstration items from different parts of band 3, and when everybody understands what he is to do, give the signal for the group to be ready to begin the test. Play the whole Rhythm section without interruption.

## TIME

After the Rhythm measure is completed, turn the record over to side 2 and say,

"Turn over your answer sheet. The section you are to mark for the next test is on the other side of the answer sheet.<sup>5</sup> (*Allow enough time for everyone to do this.*) The next part tests your sense of Time. You will hear two tones which are different in length. If the second tone is longer than the first, you should blacken the space under the letter L for that item in the section of the answer sheet labeled 'Time.' If the second tone is shorter than the first, mark the space under the letter S for that item. There is always a difference; if you are not sure, guess. There will be 50 pairs of tones on this test. Now listen to a few practice items to see how they go, but do not make any marks for these on your papers."

Give a few demonstration items from different parts of band 1, and when everyone understands what he is to do, give the signal for the group to be ready to begin the test. Play the whole Time section without interruption.

<sup>3</sup>This is especially important when testing younger subjects (e.g., 4th, 5th, and 6th graders) who may have difficulty with words such as "Timbre," but will usually understand what is expected after they have heard enough examples.

<sup>4</sup>If you are using the 78 rpm records, be sure the correct record is face up.

<sup>5</sup>If some other order of testing is given, be sure to tell when to turn the answer sheets.

## TIMBRE

After the test of sense of Time is finished, say,

"The next part measures your sense of Timbre or tonal quality. You will hear two tones that are either the same or different in timbre. If they are the same, you are to blacken the space under the letter S for that item in the section of the answer sheet labeled 'Timbre.' If the second tone is different from the first, mark the space under the letter D. There are 50 pairs of tones in this test. You are to decide whether the two tones have the same tonal quality or not and mark your papers for same or different. Now listen to a few practice items to see how they go, but do not mark your papers for these."

Give a few demonstration selections from different parts of band 2. When everyone understands what he is to do, give the signal for the group to be ready to begin the test. Everyone should answer every item. Play the whole Timbre band without interruption.

## TONAL MEMORY

After the Timbre section is completed, say,

"The next part is a test of Tonal Memory. In each trial you will hear a short series of notes played twice. In the second playing, one note is changed. You are to decide which note is changed; the first, the second, the third, and so on, and blacken the space under that number in the section of the answer sheet labeled 'Tonal Memory.' There is always some note in the second playing that is different from the corresponding note in the first playing. As you hear the notes in each set, count them silently to yourself, one, two, three, etc., so that you can identify the note that is changed. There are 30 sets of tones in this test. Now listen to a few practice sets, but do not mark your papers for these."

Give a few demonstration sets from different parts of the band. When everyone understands the task, give the signal for the group to be ready to begin the test. Play the whole Tonal Memory section without interruption.

## DIRECTIONS FOR SCORING

The *Seashore Measures of Musical Talents* can be scored either by hand or by use of an IBM test scoring machine. The same set of scoring stencils is used for both methods.

There are two scoring stencils, one for each side of the answer sheet. The stencil for Side 1, Front, contains keys for the Pitch, Loudness, and Rhythm measures, while the stencil for Side 2, Back, contains keys for the Time, Timbre, and Tonal Memory measures. For each of the six measures, the score is the number of items correctly answered.

### HAND SCORING

Before scoring, the answer sheets must be inspected to determine whether more than one choice has been marked for any item. Where such multiple marking occurs, the item should be omitted from the scoring. A horizontal red line may be drawn through all multiple responses to an item; then, in scoring, items with red marks are omitted from the count.

In placing the scoring stencil over an answer sheet, care must be taken to assure that the proper stencil is being used for the side of the answer sheet to be scored and that the stencil is correctly placed on the answer sheet so that the four edges are even. This will bring the punched holes in the stencil directly over the appropriate answer spaces. Count and record the number of correct responses for each of the six measures separately. This procedure yields the raw score for each measure.

### MACHINE SCORING

Every answer sheet should be scanned before it is scored. Light marks should be made darker and stray marks erased. Where more than one choice is marked for an item, all the

marks for that item should be completely erased. The A, B, and C formula switches should be set at R and left in that position for all scoring of this test. Three scores can be read with each pass of an answer sheet. With Side 1, Front, with the master control switch at A, the raw score for the Pitch test appears on the dial. By turning the master control switch successively to B and C, scores for Loudness and Rhythm, respectively, are registered. With Side 2, Back, scores for Time, Timbre, and Tonal Memory may be read with the master control switch at A, B, and C, respectively. These switch settings are summarized in the following table:

Measure	Master Control Switch	Formula Switch
Pitch (Side 1 — Front)	A	R
Loudness (Side 1 — Front)	B	R
Rhythm (Side 1 — Front)	C	R
Time (Side 2 — Back)	A	R
Timbre (Side 2 — Back)	B	R
Tonal Memory (Side 2 — Back)	C	R

It is suggested that four check sheets be used in setting the scoring machine. They should be made in advance with predetermined scores. Various numbers of right answers should be used so that one check sheet will yield a high score, another a low score, and two will yield scores in the middle range. When scoring for large groups, it is wise to use check sheets not only in setting the machine, but also at periodic intervals during the course of scoring to check the accuracy of the machine. To further insure accuracy, all rescoreing should be done by a second scorer.

## NORMS

Norms for the *Seashore Measures of Musical Talents* are presented for three educational levels. These levels were selected after study of score distributions for single grades; differences among adjacent grades were generally too small to warrant presentation of norms for every grade. The combinations chosen represent the groups whose distributions differed sufficiently from those of other groups to justify separate treatment.

Sex differences in scores on the six measures were also investigated at the various grade levels. The differences were found to be very small and inconsistent from one level to another. Combined sex norms were therefore formulated.

Table II contains the percentile equivalents for each possible score on the six measures for the three educational groupings. The percentile equivalent indicates the proportion of the population who scored at or below the particular score. For example, if a fourth grade pupil obtained a score of 33 on the Pitch test, by referring to Table II-A it is noted that his percentile equivalent would be 56; i.e., he scored as well as or better than 56% of fourth and fifth grade students.

Inspection of the norms table will reveal that small differences in score are associated with large differences in percentile equivalent. This is least characteristic of the fourth and fifth grade pupils, and most characteristic of the high school and college students. It is an important fact for the interpretation of scores at all grade levels, however. Where a single point of score can account for large variation in percentile rank, the score must be recognized as representing relatively rough placement of the examinee. A high score earned by a college student may be interpreted as placing him in the upper half or top quarter, but no more precise ranking should be attempted. A low score by a college student would permit somewhat more refined judgment.

The larger numbers of cases contributing to the elementary school norms for the Pitch, Rhythm, and Tonal Memory tests reflect the greater popularity of these measures and a widespread practice of limiting musical talent testing to just these three.

## VALIDITY

The senior author of these measures always steadfastly maintained that their internal validity was well established and that attempts to validate them against fallible external criterion measures such as judgments of omnibus musical behavior were inappropriate. Seashore (16) set forth his views in detail, saying in part that the *Measures of Musical Talents* ". . . have been validated for what they purport to measure . . . When we have measured the sense of pitch, that is, pitch discrimination, in the laboratory with high reliability and we know that pitch was isolated from all other factors, no scientist will question but that we have measured pitch." He goes on to explain the role of the specific measurements obtained from these tests by saying that, "It is easy to show that we cannot find a good violinist who does not have a good sense of pitch; or a good pianist who does not have a good sense of intensity . . . But it does not follow that goodness in these capacities alone will make a good artist.

"Validation of pitch against the violinist's artistic per-

formance in the actual musical situation would require that we correlate the sense of pitch with objective records of musical performance in *pitch intonation* or ability to hear *artistic pitch deviation* in the musical situation — not with the countless other merits or demerits that the violinist may exhibit . . ."

In addition to knowing that the tests are truly measures of the specific abilities they were designed to assess, the user is properly interested in what kinds of achievement the measures will predict. Studies have been reported where scores on the *Measures of Musical Talents* were correlated with external criteria which were typically estimates of extent of musical achievement. References to such studies are noted in the bibliography of this Manual. Bienstock (2) and Lundin (24, p. 208) present summaries of such validation studies. The predictions of achievement test scores on the *Music Notation Test* and of instrumental performance are reported by Farnum (10, 11).

## RELIABILITY

The reliability of the *Seashore Measures of Musical Talents* was estimated by means of internal consistency coefficients (Kuder-Richardson formula 21). This formula has the virtue of providing conservative coefficients, since its use is more likely to underestimate than overestimate reliability. Coefficients are presented in Table I for each measure at the grade levels represented in the norms groups. The means, standard deviations, and numbers of cases relevant to these coefficients are those which appear in the norms table.

Those coefficients which are relatively low emphasize the importance of interpreting scores in broad categories only. Where important decisions are to be made with respect to doubtful performances, retesting of the individual is imperative.

	TABLE I		
	Coefficients of Reliability		
	Grades 4-5	Grades 6-8	Grades 9-16
Pitch	.82	.84	.84
Loudness	.85	.82	.74
Rhythm	.67	.69	.64
Time	.72	.63	.71
Timbre	.55	.63	.68
Tonal Memory	.81	.84	.83

TABLE II.A. NORMS

Percentile Equivalents of Raw Scores Obtained by Students in Grades 4-5

	<u>PITCH</u> <u>%ile</u>	<u>LOUDNESS</u> <u>Score</u> <u>%ile</u>		<u>RHYTHM</u> <u>Score</u> <u>%ile</u>		<u>TIME</u> <u>Score</u> <u>%ile</u>		<u>TIMBRE</u> <u>Score</u> <u>%ile</u>		<u>TONAL MEMORY</u> <u>Score</u> <u>%ile</u>	
		47-50	99	48-50	99	29-30	99	44-50	99	44-50	99
46	98	47	98	28	96	43	98	43	98	28	98
45	98	46	96	27	91	42	97	42	98	27	97
44	96	45	93	26	83	41	94	41	98	26	95
43	95	44	89	25	74	40	92	40	95	25	93
42	92	43	82	24	64	39	89	39	92	24	89
41	89	42	76	23	53	38	85	38	91	23	86
40	86	41	71	22	42	37	81	37	86	22	82
39	83	40	63	21	33	36	76	36	82	21	78
38	79	39	56	20	24	35	69	35	79	20	74
37	74	38	53	19	18	34	65	34	72	19	69
36	70	37	48	18	14	33	57	33	65	18	64
35	65	36	43	17	11	32	50	32	58	17	58
34	61	35	38	16	8	31	45	31	50	16	53
33	56	34	34	15	6	30	40	30	42	15	47
32	52	33	31	14	4	29	35	29	34	14	41
31	48	32	28	13	3	28	30	28	27	13	35
30	43	31	26	12	2	27	26	27	20	12	30
29	38	30	23	0-11	1	26	21	26	14	11	24
28	34	29	19	16	1	25	16	25	9	10	17
27	30	28	16	12	1	24	12	24	6	9	13
26	26	27	13	11	1	23	9	23	4	8	9
25	22	26	11	10	1	22	5	22	2	7	5
24	18	25	10	9	1	21	4	21	2	6	3
23	15	24	8	7	1	20	4	20	1	0-5	1
22	12	23	5	4	1	19	2	18	2	2	1
21	9	22	4	3	1	17	2	17	2	2	1
20	7	21	2	1	1	16	0-16	16	0-20	0-5	1
19	5	20	2	1	1	15	1	15	1	1	1
18	4	19	2	1	1	14	1	14	1	1	1
17	3	18	2	1	1	13	1	13	1	1	1
16	2	17	1	1	1	12	1	12	1	1	1
0-15	1	16	1	1	1	11	1	11	1	1	1
N	3480	380	3476	377							
Mean	31.7	36.3	22.6	31.8							
SD	7.6	7.7	4.0	6.3							
					3477	377					
					16.3	31.6					
					5.9	6.3					

TABLE II-B. NORMS

Percentile Equivalents of Raw Scores Obtained by Students in Grades 6-8

	PITCH %ile	LOUDNESS		RHYTHM		TIME		TIMBRE		TONAL MEMORY	
		Score	%ile	Score	%ile	Score	%ile	Score	%ile	Score	%ile
	48-50	99	99	30	99	45-50	99	47-50	99	30	99
47	98	48	98	29	97	44	98	46	98	29	97
46	96	47	96	28	91	43	96	45	98	28	93
45	93	46	93	27	83	42	93	44	97	27	88
44	89	45	87	26	72	41	89	43	95	26	83
43	85	44	81	25	60	40	85	42	92	25	77
42	81	43	76	24	48	39	80	41	88	24	71
41	75	42	68	23	38	38	74	40	82	23	66
40	70	41	61	22	28	37	67	39	77	22	59
39	65	40	55	21	21	36	59	38	71	21	53
38	59	39	47	20	16	35	51	37	66	20	47
37	54	38	41	19	11	34	43	36	59	19	41
36	49	37	36	18	8	33	38	35	52	18	36
35	44	36	31	17	5	32	31	34	44	17	31
34	39	35	26	16	4	31	24	33	37	16	26
33	35	34	23	15	2	30	19	32	28	15	22
32	30	33	19	14	2	29	15	31	22	14	18
31	27	32	15	0-13	1	28	11	30	18	13	15
30	24	31	13	10	7	27	9	29	13	12	12
29	21	30	10	7	4	26	7	28	10	11	9
28	17	29	9	5	2	25	4	27	7	10	6
27	15	28	6	4	2	24	2	26	5	9	5
26	13	27	5	2	1	23	0-23	25	3	8	3
25	11	26	4	1	1	22	2	24	2	0-7	1
24	9	25	3	1	1	21	1	22	1	0-23	1
23	7	24	3	1	1	20	0-21	21	1	0-23	1
22	6	23	2	1	1	19	0-19	20	1	0-23	1
21	5	22	2	1	1	18	0-18	19	1	0-23	1
20	4	21	2	1	1	17	0-17	18	1	0-23	1
19	3	19	3	1	1	16	0-16	17	1	0-23	1
18	3	18	3	1	1	15	0-15	16	1	0-23	1
17	2	17	2	1	1	14	0-14	15	1	0-23	1
0-16	1	15	1	1	1	13	0-13	14	1	0-23	1
N	2555	1200				2499				952	951
Mean	35.5	38.6				24.0				34.9	35.2
SD	7.7	6.6				3.8				5.2	5.9

**TABLE II-C. NORMS**

Percentile Equivalents of Raw Scores Obtained by Students in Grades 9-16

	PITCH	LOUDNESS		RHYTHM		TIME		TIMBRE		TONAL MEMORY	
		Score	%ile	Score	%ile	Score	%ile	Score	%ile	Score	%ile
49-50	<b>99</b>	50	<b>99</b>	30	<b>99</b>	49-50	<b>99</b>	48-50	<b>99</b>	30	<b>99</b>
48	<b>96</b>	49	<b>98</b>	29	<b>90</b>	48	<b>98</b>	47	<b>97</b>	29	<b>85</b>
47	<b>92</b>	48	<b>94</b>	28	<b>73</b>	47	<b>96</b>	46	<b>95</b>	28	<b>72</b>
46	<b>84</b>	47	<b>87</b>	27	<b>55</b>	46	<b>92</b>	45	<b>92</b>	27	<b>61</b>
45	<b>77</b>	46	<b>79</b>	26	<b>39</b>	45	<b>86</b>	44	<b>88</b>	26	<b>52</b>
44	<b>68</b>	45	<b>68</b>	25	<b>28</b>	44	<b>79</b>	43	<b>83</b>	25	<b>43</b>
43	<b>60</b>	44	<b>59</b>	24	<b>19</b>	43	<b>71</b>	42	<b>76</b>	24	<b>35</b>
42	<b>52</b>	43	<b>48</b>	23	<b>12</b>	42	<b>62</b>	41	<b>69</b>	23	<b>29</b>
41	<b>45</b>	42	<b>39</b>	22	<b>8</b>	41	<b>53</b>	40	<b>61</b>	22	<b>24</b>
40	<b>40</b>	41	<b>30</b>	21	<b>5</b>	40	<b>45</b>	39	<b>52</b>	21	<b>20</b>
39	<b>35</b>	40	<b>24</b>	20	<b>3</b>	39	<b>37</b>	38	<b>45</b>	20	<b>16</b>
38	<b>30</b>	39	<b>18</b>	19	<b>2</b>	38	<b>30</b>	37	<b>38</b>	19	<b>12</b>
37	<b>26</b>	38	<b>15</b>	11	<b>1</b>	37	<b>24</b>	36	<b>31</b>	18	<b>10</b>
36	<b>23</b>	37	<b>11</b>	11	<b>1</b>	36	<b>19</b>	35	<b>25</b>	17	<b>8</b>
35	<b>20</b>	36	<b>9</b>	7	<b>1</b>	35	<b>15</b>	34	<b>20</b>	16	<b>6</b>
34	<b>17</b>	35	<b>7</b>	7	<b>1</b>	34	<b>12</b>	33	<b>15</b>	15	<b>4</b>
33	<b>15</b>	34	<b>5</b>	5	<b>1</b>	33	<b>9</b>	32	<b>11</b>	14	<b>3</b>
32	<b>13</b>	33	<b>3</b>	3	<b>1</b>	32	<b>7</b>	31	<b>8</b>	13	<b>2</b>
31	<b>11</b>	32	<b>3</b>	3	<b>1</b>	31	<b>5</b>	30	<b>6</b>	1	<b>1</b>
30	<b>9</b>	31	<b>2</b>	2	<b>1</b>	30	<b>4</b>	29	<b>4</b>	27	<b>2</b>
29	<b>8</b>	30	<b>2</b>	2	<b>1</b>	29	<b>3</b>	28	<b>3</b>	27	<b>2</b>
28	<b>6</b>	0-29	<b>1</b>	1	<b>1</b>	28	<b>2</b>	27	<b>2</b>	0-26	<b>1</b>
27	<b>5</b>	27	<b>5</b>	5	<b>1</b>	27	<b>2</b>	27	<b>2</b>	0-26	<b>1</b>
26	<b>4</b>	26	<b>3</b>	3	<b>1</b>	26	<b>2</b>	26	<b>2</b>	0-26	<b>1</b>
25	<b>2</b>	25	<b>2</b>	2	<b>1</b>	25	<b>1</b>	25	<b>1</b>	0-26	<b>1</b>
24	<b>2</b>	24	<b>2</b>	2	<b>1</b>	24	<b>1</b>	24	<b>1</b>	0-26	<b>1</b>
23	<b>2</b>	23	<b>2</b>	2	<b>1</b>	23	<b>1</b>	23	<b>1</b>	0-26	<b>1</b>
0-22											
N	4314	4319								4316	4068
Mean	40.4	42.8								40.3	38.6
SD	6.6	4.7								5.1	5.1

## ACKNOWLEDGMENTS

Scores for the norms table were submitted by schools in the following communities: Northbrook, Ill.; Grand Haven, Mich.; Spring Lake, Mich.; Onamia, Minn.; Harlowtown, Mont.; Niagara Falls, N. Y.; Olean, N. Y.; Windsor, N. Y.;

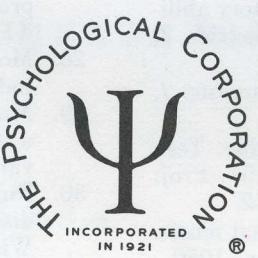
Bedford, Ohio; Shaker Heights, Ohio; Verona, Pa.; Seattle, Wash.

The following colleges contributed scores: University of Maine, Orono, Me.; Union College of Schenectady, N. Y.; Casper Junior College, Casper, Wyo.

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For additional references, see Buros' *Mental Measurements Yearbooks*.



Scoring formula = Rights

IF SCORING BY HAND,  
CUT OUT THIS SPACE TO  
FACILITATE RECORDING.

Machine Scoring:  
Machine Scoring:

**SEASHORE MEASURES OF MUSICAL TALENTS**  
**SERIES A**

(1939 Revision)

- PITCH — Set Master Control Switch at "A," and "A" Formula Switch at R.  
LOUDNESS — Set Master Control Switch at "B," and "B" Formula Switch at R.  
RHYTHM — Set Master Control Switch at "C," and "C" Formula Switch at R.

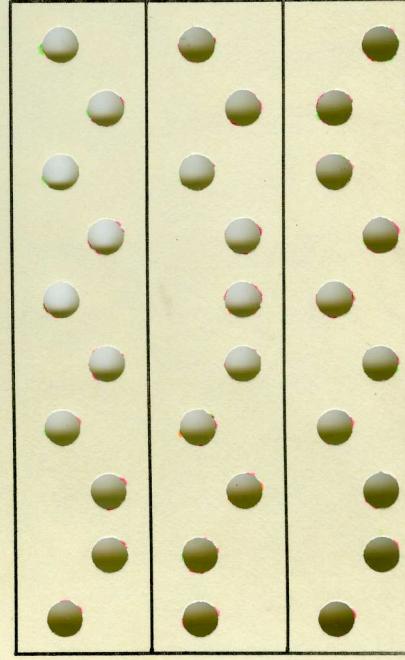
RIGHTS Key. May be used for hand or machine scoring.

SIDE 1 — FRONT

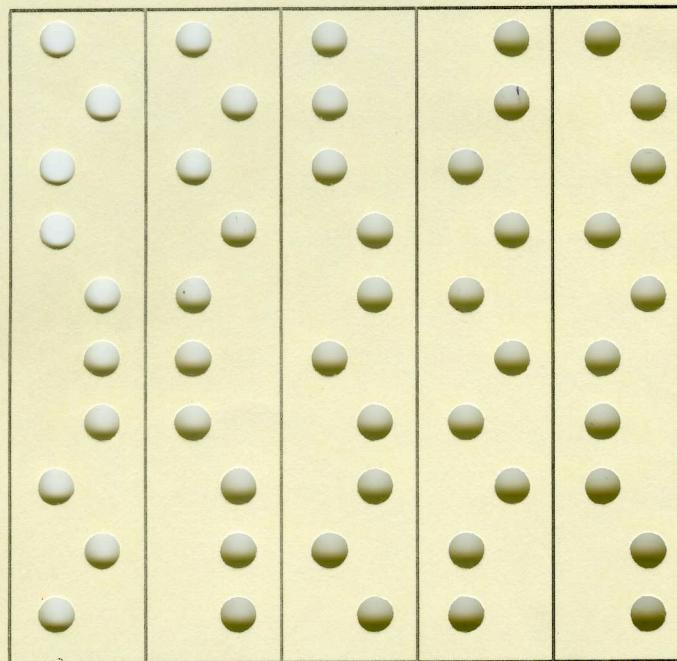
PITCH



RHYTHM



LOUDNESS



Scoring formula = Rights

Machine Scoring:

TIME — Set Master Control Switch at "A," and "A" Formula Switch at R.

TIMBRE — Set Master Control Switch at "B," and "B" Formula Switch at R.

TONAL MEMORY — Set Master Control Switch at "C," and "C" Formula Switch at R.

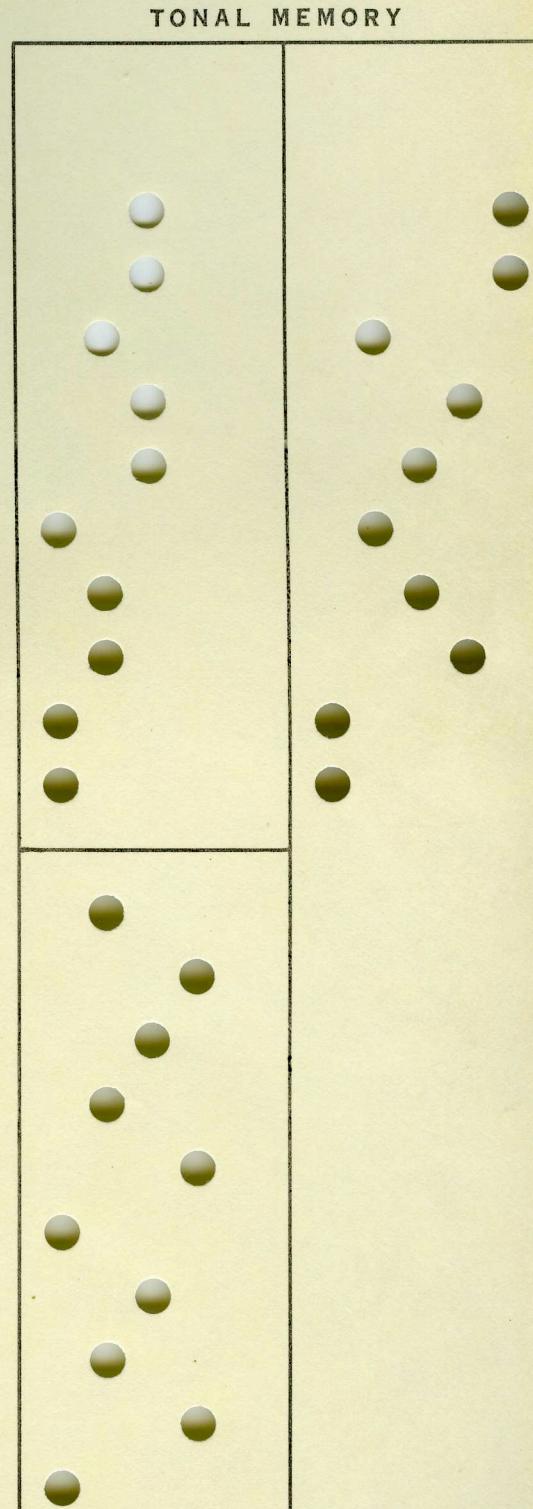
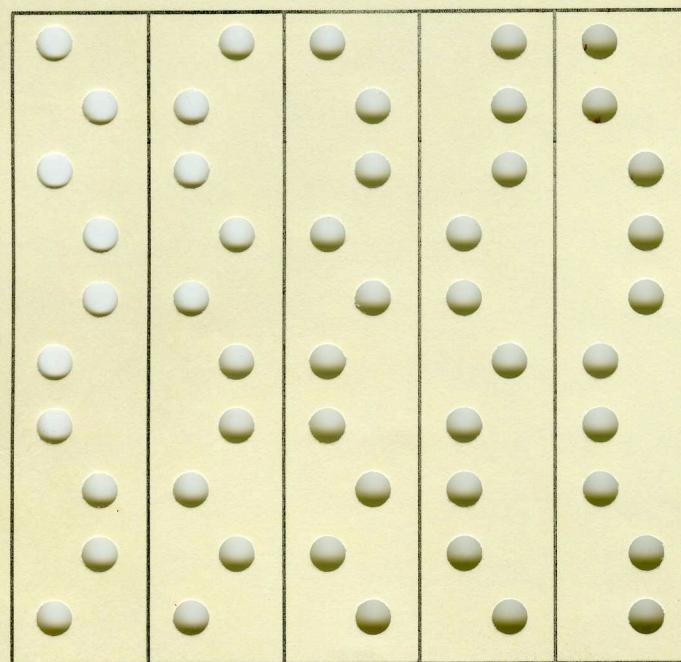
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SEASHORE MEASURES OF MUSICAL TALENTS  
(1939 Revision)

SERIES A

RIGHTS Key. May be used for hand or machine scoring.

SIDE 2 - BACK



For each test, place your answers one below another in column A until  
that is filled, then down column B, and so on.

### TIME

	A	B	C	D	E
1	L S	L S	L S	L S	L S
2	L S	L S	L S	L S	L S
3	L S	L S	L S	L S	L S
4	L S	L S	L S	L S	L S
5	L S	L S	L S	L S	L S
6	L S	L S	L S	L S	L S
7	L S	L S	L S	L S	L S
8	L S	L S	L S	L S	L S
9	L S	L S	L S	L S	L S
10	L S	L S	L S	L S	L S

### TONAL MEMORY

	A	B	C
1	1 2 3	1 2 3 4 5	1 2 3 4 5
2	1 2 3	1 2 3 4 5	1 2 3 4 5
3	1 2 3	1 2 3 4 5	1 2 3 4 5
4	1 2 3	1 2 3 4 5	1 2 3 4 5
5	1 2 3	1 2 3 4 5	1 2 3 4 5
6	1 2 3	1 2 3 4 5	1 2 3 4 5
7	1 2 3	1 2 3 4 5	1 2 3 4 5
8	1 2 3	1 2 3 4 5	1 2 3 4 5
9	1 2 3	1 2 3 4 5	1 2 3 4 5
10	1 2 3	1 2 3 4 5	1 2 3 4 5

SCORE		
TIME		
TIMBRE		
TONAL MEMORY		

Be sure your marks are heavy and black.  
Erase completely any answer you wish to change.

### TIMBRE

	A	B	C	D	E
1	S D	S D	S D	S D	S D
2	S D	S D	S D	S D	S D
3	S D	S D	S D	S D	S D
4	S D	S D	S D	S D	S D
5	S D	S D	S D	S D	S D
6	S D	S D	S D	S D	S D
7	S D	S D	S D	S D	S D
8	S D	S D	S D	S D	S D
9	S D	S D	S D	S D	S D
10	S D	S D	S D	S D	S D

### B

1	1 2 3 4
2	1 2 3 4
3	1 2 3 4
4	1 2 3 4
5	1 2 3 4
6	1 2 3 4
7	1 2 3 4
8	1 2 3 4
9	1 2 3 4
10	1 2 3 4

**SEASHORE MEASURES  
OF  
MUSICAL TALENTS**  
(1939 REVISION)  
SERIES A

NAME	SCORE	PERCENTILE
	PITCH	
	LOUDNESS	
	RHYTHM	
	TIME	
	TIMBRE	
	TONAL MEMORY	
	NORMS USED	

FIRST \_\_\_\_\_ CITY \_\_\_\_\_  
 SCHOOL OR COMPANY \_\_\_\_\_  
 AGE \_\_\_\_\_ YEARS MONTHS SEX \_\_\_\_\_ M O R F \_\_\_\_\_  
 LAST SCHOOL GRADE COMPLETED \_\_\_\_\_

For each test, place your answers one below another in column A until that is filled, then down column B, and so on.

**PITCH**

	A	B	C	D	E
1	H L	H L	H L	H L	H L
2	H L	H L	H L	H L	H L
3	H L	H L	H L	H L	H L
4	H L	H L	H L	H L	H L
5	H L	H L	H L	H L	H L
6	H L	H L	H L	H L	H L
7	H L	H L	H L	H L	H L
8	H L	H L	H L	H L	H L
9	H L	H L	H L	H L	H L
10					

**RHYTHM**

	A	B	C
1	S D	S D	S D
2	S D	S D	S D
3	S D	S D	S D
4	S D	S D	S D
5	S D	S D	S D
6	S D	S D	S D
7	S D	S D	S D
8	S D	S D	S D
9	S D	S D	S D
10			

Be sure your marks are heavy and black.  
 Erase completely any answer you wish to change.

**LOUDNESS**

	A	B	C	D	E
1	S W	S W	S W	S W	S W
2	S W	S W	S W	S W	S W
3	S W	S W	S W	S W	S W
4	S W	S W	S W	S W	S W
5	S W	S W	S W	S W	S W
6	S W	S W	S W	S W	S W
7	S W	S W	S W	S W	S W
8	S W	S W	S W	S W	S W
9	S W	S W	S W	S W	S W
10					

