Lafayette Instrument®

Purdue Pegboard Scoring Application for iOS®

User's Manual

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Introduction

Thank you for downloading the Purdue Pegboard Scoring Application. This application is intended for use with the Lafayette Instrument Company Purdue Pegboard Test, model 32020/32020A (visit our website for more details). Lafayette Instrument Company has been dedicated to providing quality products to the Life Science and Evaluation markets for over 65 years, and we are glad to continue meeting the needs of our customers. If you have any questions or concerns regarding our products, please do not hesitate to contact us.

Hardware Setup

As mentioned above, this application is meant to be used with our Purdue Pegboard Test as a means to capture, store, and manage data generated during subject tests. Hardware specific information including test setup and administration can be found in the corresponding Purdue Pegboard hardware manual. Visit our website should a new copy of that manual be required. Please refer to that document for any questions regarding hardware or test specifics.

Home Screen Icons

Upon launching the app, the user will see three distinct icons along the right side of the menu bar at the top of the screen. There are also two sections in the center of the screen labelled "Subjects" and "Tests" with corresponding "+" icons, as shown below.

From left to right, the icons at the top of the screen have the following functions:

Help: Tapping this icon allows the user to open this guide.

Shopping Cart: Tapping this icon will take the user to the trial store. See below for more information regarding the purchase of additional trials.

Menu List: By tapping this icon, the user is able to select from the Examiner, Subject, Test, and Group Lists. By tapping any of these, the user will be taken to the selected list where older records may be viewed or exported and new records may be created. More information regarding each specific list can be found in the "Lists" section on page 6.

The "+" icons on the home screen may be tapped on the fly to quickly add a new subject or begin a new test. In addition, the most recently added subjects and tests are displayed within their respective sections. These may also be tapped in order to view the details of the subject or test.

Additional Icons

While using this application, there are many icons that will be used to perform other necessary functions such as saving new records or navigating back to the previous screen. They are as follows:

Save: The user may tap this icon at the top of the screen when creating or editing records to save any changes and return to the previous screen.

Back Arrow: When applicable, this icon will appear in the upper left portion of the screen. Tapping it will return the user to the previously displayed screen.

Next Arrow: During a test, this icon will appear in the upper right portion of the screen. Tapping it will usually advance the test, however, this feature will be locked during a timed event. This icon also appears when reviewing a completed test, but tapping it will return the user to the previous screen rather than progressing the test.

Read Instructions: Tapping this icon during a test causes the device to verbalize the displayed instructions. This may be useful when trying to avoid confusion, or when the subject makes a request for the instructions to be repeated.

Stop: During a timed event in a test, the administrator may tap this icon to clear the timer and restart the event.

New Test: While viewing a subject, the user may tap this icon to initiate a new test using the selected subject information.

History Graph: When viewing either a subject or a subject group, tap this icon in order to bring up a chart (for single subjects) or a table of statistics (for subject groups) that contain data from all of the tests associated with that particular subject or group.

Statistics Settings: When viewing test results, tapping this icon displays a series of settings allowing the user to select between calculating percentiles based on the general population or purely by subject group, as well as whether or not to display a standard score on the results screen. The different percentile types aid the practitioner in assessing a subject's performance in relation to the rest of the population or in relation to a smaller, user-defined group. This may be useful, for example, when comparing subjects that perform a particular task to each other rather than to the larger population.

General Percentile Calculation: The general percentiles are calculated assuming a normal distribution based on the means and standard deviations reported by the tables in Appendix A. For specifics, please refer to that section. The percentiles listed are specific to the user's gender and age. If no percentile is shown, then the associated subject record either does not contain a gender or age, or the age given is not within the necessary range.

The Purdue Pegboard app supports multiple scoring types: NIH Standard Score and Z-score. Both z-score and standard scoring are available for both app-based and manual entry data.

* http://www.healthmeasures.net/score-and-interpret/interpret-scores/nih-toolbox

Normalized Score Calculation:

$$\text{Z-Score} = \frac{(\text{Raw Score} - \text{Mean})}{\text{Standard Deviation}}$$

NIH Standard Score = 100 + (15 * Z-score)

NIH Standard Score are calculated based on NIH definition
http://www.healthmeasures.net/score-and-interpret/interpret-scores/nih-toolbox

Print View: While reviewing data, this icon may be tapped in order to print out the document as it is displayed. If necessary, tap the Select Printer button to select which printer to send the document. Once a printer has been selected, the document can be printed by tapping the Print Button at the bottom of the Printer Options dialog box.

Lists

Each of these lists is managed and operated in the same way, however, creating and editing records in each of them will be done differently. On each list page, the user will find a "+" icon in the upper right portion of the screen. By tapping this, the user will be able to create a new record. Older records (apart from test records) may be edited by tapping the associated text within the list itself.

Information specific to each type of record is as follows:

Examiners: When creating or editing an examiner, the only information required are the first and last names of the person who will be administering tests. These fields may be edited by tapping just beneath the field labels and typing in the desired names. Remember to save the record when all of the necessary changes have been made.

Subjects: Subject records contain the information relating to the individuals who are to be tested. Creating or editing a subject is very similar to creating or editing an examiner. There are several more fields to fill in, but fields such as "Dominant Hand", "Gender", and "Birth Date" are completed by tapping beneath the field header, then scrolling to and selecting the desired option from a list. These lists may be navigated by tapping and swiping in the direction the list is to be moved. Once the selection is visible, it may be tapped to enter it into the field.
For the numeric "Education Level", a number should be entered that indicates the number of years the subject has completed in school. For instance, a high school graduate with no college experience would be a 12. A subject that has completed a 4-year college degree would be a 16.

As an alternative method to creating a new group from the group list, new groups may also be created from the subject record by tapping the "Group" field and selecting the "Create New Group…" option. See below for information on groups.

Once all of the desired changes have been made, the subject record should be saved by tapping the "Save" icon.

Groups: Groups are used to organize subjects based on user defined labels. To create a new group, tap the "+" icon on the group list to bring up a new group record. Creating a group from a subject record will bring up the same screen. The new record only requires a name in the "Group Name" field, and it can be updated by tapping the text area and then entering the desired information. Once complete, the group record should be saved by tapping the "Save" icon.

Tests: New tests can be initiated in one of two ways. The first way is to navigate to the Test List and then tap the "+" icon to create a blank test. An alternative method is to open the subject record of the individual to be tested and then tap the "New Test" icon, as described above. This will create a new test record with the subject details entered, saving the user some time. Please refer to the section titled "Running a Test" for additional information.
When finished editing or creating a subject, examiner, or group record, apply any changes by tapping the "Save" icon in the upper right portion of the screen. This will also return the user to the previous screen. Completed tests cannot be edited.

Running a Test

Once a new test record has been created and the subject has been selected, there will be a few more fields and options that need to be filled in before continuing. First, the test administrator should be selected in the "Examiner" field if the correct indiviudal is not already selected. Second, any specific notes regarding the test can be added to the "Notes" field. This is not required in order to continue, but provides a space for additional information that may be relevant to the study.

In the "Trials" field, the user can select the desired number of trials to be completed during the test by tapping the "+" and

"-" buttons. This will increase or decrease the number of trials respectively. There are four trial types to choose from, and the number of each type can be chosen individually.

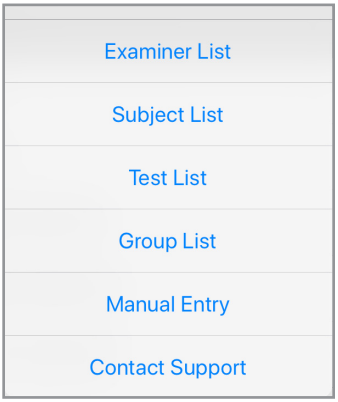
Once the trials have been selected, tap the "Next" icon to continue. At the next screen, the administrator will be given the option to re-order the trials as needed. This can be accomplished by tapping the trial that is to be moved to select it and subsequently tappping the "Up" and "Down" buttons to the right in order to move the selected trial accordingly throughout the list. Once the proper trial order has been achieved, tapping the "Next" icon will initiate the trials. On-screen instructions will lead the administrator through the testing process.

Upon completing a trial, the administrator will be prompted to enter the completion amount for that particular trial.

Once the entire test is complete, the administrator will be presented with a table summarizing the results of the test along with some additional statistics, including the subject's average and percentile for each trial type. This information will be saved, and can be accessed again later by selecting the same test in the test list.

Manual Score Entry

In addition to directly running a test via the app, an administrator can enter the final scores into the app directly for statistical or normative comparison. The Manual Score Entry mode can be found by tapping the hamburger-style button and selecting “Manual Entry.”



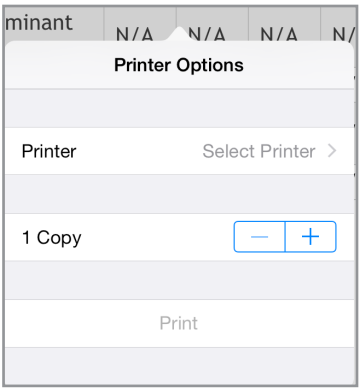
Enter a gender and birthdate and as many or few results as necessary. Continue by tapping the “Calculate” button to display the Summary page.

Manual Entry is not an alterative to using the app for running a test. Unlike a completed test, the entered scores and comparisons are not logged by the app nor stored in the app database. If this data is significant, we recommend printing or storing it by alternative means.

Printing Data

Subject history charts, group statistics, and completed test tables can be printed. While viewing the desired table or chart, tapping the “Print View” icon will bring up a preview of the document as well as options for printing. If necessary, tap the Select Printer button on the dialog box and select a connected printer.

Once a printer has been selected, the document can be printed by tapping the Print Button at the bottom of the Printer Options dialog box.

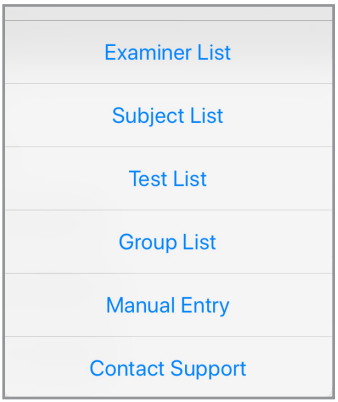


Purchasing Additional Trials

Additional trials may be purchased by tapping the "Shopping Cart" icon. Bulk quantities are sold so that trials cost less per unit for any user planning to work extensively with this app. Depending upon your settings, it may be necessary to enter your iTunes login information in order to finalize a purchase.

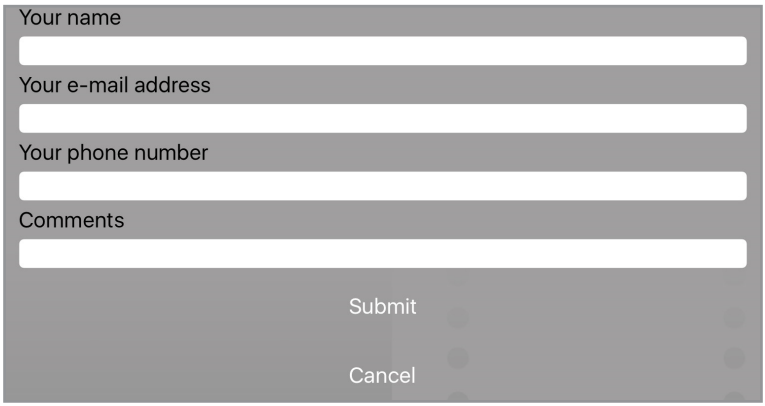
Contact Support and Submit Error Report

Users may contact our support team at any time by choosing "Contact Support" from the menu bar drop down. A short form will be made available.



Also, in the event of an unexpected error, the user may be prompted to submit a report to Lafayette Instrument Company. If this is the case, a short form will be made available automatically asking the user to include their contact information and any comments regarding the issue.

The form can be filled out by tapping in each field and entering the applicable information individually. When completed, the form may be sent to our team of software engineers by tapping the "Submit" button. If it is not desired to submit the form, the "Cancel" button may be tapped to exit the process.



Appendix A: Normative Tables

The following normative tables were taken directly from the Purdue Pegboard Test Manual. If you require a copy of this manual, visit our website*.

http://lafayetteevaluation.com/purdue-pegboard

Table 14-26
Performance of Children on Purdue Pegboard
(One Trial per Subtest)

		Preferred Hand		Nonpreferred Hand		Both Hands		Assembly	
Age	**n**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Boys									
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
14:6-14:1.1	30	14.70	1.49	14.33	1.65	12.20	1.61	31.37	7.24
15:0-1.5:5	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

(continued)

Table 14-26
Performance of Children on Purdue Pegboard
(One Trial per Subtest)
continued

		Preferred Hand		Nonpreferred Hand		Both Hands		Assembly	
Age	**n**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Girls									
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)

Table 14-25
Mean Performance of Adults for the Purdue Pegboard (Three Trials per Subtest)

	Age Groups				
	40-49	**50-59**	**60-69**	**70-79**	**80-89**
Males					
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
Nonpreferred 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
Purdue Assembly	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
Females					
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
Nonpreferred 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
Purdue Assembly	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

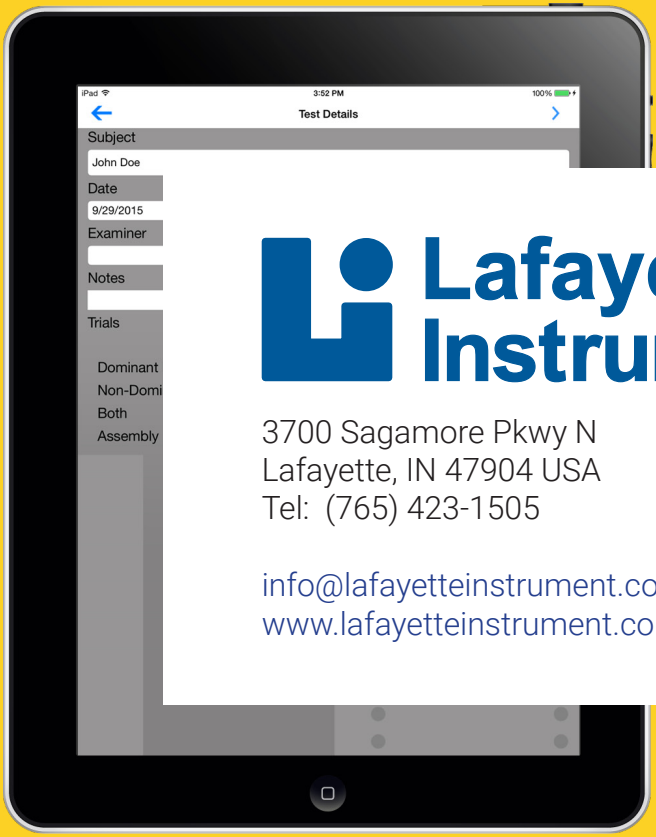
Source: Agnew et al., 1988. Reprinted with permission of Lawrence Erlbaum Assocates, Inc.

Table 14-22
Mean Performance of Young Adults for the Purdue Pegboard (One Trial Per Subtest)

	Age Groups				
	15-20	21-25	26-30	31-40	15-40
Females					
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
Nonpreferred 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
Males					
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
Nonpreferred 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).



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